SECTION 28 23 29

H.265 12 AND 6 MEGAPIXEL SUPERIOR HD TRUE DAY/NIGHT IR IP FISHEYE CAMERA

1. GENERAL
	1. SECTION INCLUDES
		1. Provide a high definition 12 or 6 megapixel superior HD TDN, IR indoor/outdoor IP fisheye camera system for video surveillance, including design, supply, installation, and commissioning.
	2. RELATED SECTIONS

NOTE TO SPECIFIER: Include related sections as appropriate if video surveillance system is integrated to other systems.

* + 1. Section 26 05 00: Common Work Results for Electrical, for interface and coordination with building electrical systems and distribution.
		2. Section 28 05 13: Conductors and Cables for Electronic Safety and Security, for cabling between system servers, panels, and remote devices.
		3. Section 28 05 28: Pathways for Electronic Safety and Security, for conduit and raceway requirements.
		4. Section 28 23 00: Video Surveillance Equipment, for interface with, and administration of video recording equipment.
		5. Section 28 23 23: Video Surveillance Systems Infrastructure.
		6. Section 28 23 29: Video Surveillance Remote Devices and Sensors.
	1. REFERENCES
		1. Reference Standards: Provide systems that meet or exceed the requirements of the following publications and organizations as applicable to the work of this Section.
			1. Canadian ICES-003.
			2. Canadian Standards Association (CSA).
			3. Conformity for Europe (CE).
			4. Electronic Industry Association (EIA).
			5. Federal Communications Commission (FCC).
			6. Institute of Electronic and Electrical Engineers (IEEE).
			7. Joint Photographic Experts Group (JPEG).
			8. National Television Systems Committee (NTSC).
			9. Phase Alternating Line (PAL).
			10. Underwriters Laboratories Inc. (UL).
			11. IP Code (Ingress Protection Rating) per IEC 60529.
	2. SYSTEM DESCRIPTION
		1. The 12 and 6 megapixel TDN IR indoor/outdoor IP fisheye camera, HFD6GR1/HFD8GR1, shall provide:
			1. Superior Image Quality
				1. HFD8GR1: Full HD 12 megapixel (4000 × 3000) resolution, up to 25 fps image with a 1/1.7" 12 megapixel progressive scan CMOS sensor.
				HFD6GR1: Full HD 6 megapixel (3072 × 2048) resolution, up to 25/30 fps image with a 1/1.8" 6 megapixel progressive scan CMOS sensor.
				2. Digital WDR, ensuring glare-free images.
				3. True day/night functionality providing vivid color images by day and clear black-and-white images at night with ICR.
				4. Image dewarping makes the fisheye output easy to view and scan for intruders.
				5. Embedded PTZ control within the fisheye video allows users to control the part of the 360° view to focus on.
				6. Excellent low-light performance with 3D noise reduction, and together with H.265 Profile codec saving storage and bandwidth.
			2. Flexible Surveillance Solution
				1. HFD8GR1: 1.98 mm, F2.8, fixed fisheye lens.
				HFD6GR1: 1.7 mm, F2.0, fixed fisheye lens.
				2. H.265, H.264 and MJPEG codec with triple stream support.
				3. IR LEDs provide up to 25 ft (8 m) of illumination in dimly lit or nighttime scenes (depending on scene reflectance).
				4. Smart IR technology provides even distribution of IR light.
				5. Waterproof (IP67) and IK10 vandal resistant camera housing.
				6. –22°F to 140°F (–30°C to 60°C) working temperature.
				7. ONVIF™ Profile S and G support.
				8. Security features include individual signed certificates and data encryption.
				9. Cameras can be retrofitted on many existing NVR installations without requiring additional storage.
			3. Easy to Install and Use
				1. Built-in PoE (Power over Ethernet) eliminates separate power supply and associated wiring; 12 V DC inputs where PoE power is unavailable.
				2. Remote configuration through web client or from the NVR.
				3. Included accessories: security screw driver, mounting screws, mounting template, mount adapter, IR LED cover, and waterproof joint for network cable.
			4. Onboard Video Storage
				1. Supports up to 128 GB microSDHC (Class 10) card for local video storage when network is interrupted. Card not included.
	3. SUBMITTALS
		1. General: Submittals shall be made in accordance with the Conditions of the Contract and Submittal Procedure Section.
		2. Manufacturer’s Product Data: Submit manufacturer’s data sheets indicating systems and components proposed for use, including instruction manuals.
		3. Shop Drawings: Submit installation drawings, including connection diagrams for interfacing equipment, list of connected equipment, and locations for major equipment components. Shop drawings shall indicate surrounding construction as provided for the Project.
		4. Project Record Drawings: Indicate location of equipment and wiring on project record drawings. Submit an electronic version of the project record drawings not later than Substantial Completion of the Project.
		5. Operation and Maintenance Data: Submit manufacturer’s operation and maintenance data customized to the system installed. Include operator manuals.
		6. Field Tests: Submit results of field testing of every device, including date, testing personnel, retesting date (if applicable), and confirmation that every device passed field testing.
		7. Maintenance Service Agreement: Submit a sample copy of the manufacturer’s maintenance service agreement, including cost and services for a one year period for Owner’s review. Maintenance shall include, but not be limited to, labor and materials to repair the system, tests and adjustments, and regular inspections.
	4. QUALITY ASSURANCE
		1. Manufacturer: Minimum 10 years experience in manufacturing and maintaining video surveillance systems. Manufacturer shall provide toll-free technical assistance and support available 24/7.
		2. Manufacture Location: Provide equipment assembled in China.
		3. Installer: Minimum 2 years experience installing similar systems and shall be acceptable to the manufacturer of the video surveillance system.
		4. Regulatory Requirements:
			1. Emissions: FCC, Part 15; CE - EN 55032; Complies with RCM (AS/NZS).
			2. Immunity: CE - EN 50130-4.
			3. Safety: North America UL Listed to UL/CSA 60950-1; CE – EN 60950-1.
		5. Environmental Requirements:
			1. Operating temperatures shall be between –22°F (−30°C) and 140°F (60°C).
			2. Relative Humidity: Less than 95%, non-condensing.
			3. Ingress Protection: IP67.
			4. Vandal Resistance: IK10.
		6. Power Requirements:
			1. Input Voltage: 12 V DC +/-10%, PoE IEEE 802.3af.
			2. Power Consumption: PoE (802.3af) Class 0, 12 V DC 10 W.
	5. DELIVERY, STORAGE, AND HANDLING
		1. Packing and Shipping: Deliver products in manufacturer’s labeled packages.
		2. Storage and Protection: Store and handle products in accordance with manufacturer’s requirements, in a facility where environmental conditions are within recommended limits.
	6. WARRANTY
		1. Manufacturer’s Guarantee: Five (5) years from the manufacture date code under normal use and service for the video surveillance system.
1. PRODUCTS
	1. MANUFACTURERS
		1. Specified Manufacturer: Honeywell 12 and 6 megapixel low light IR indoor/outdoor IP fisheye camera, [www.honeywell.com](http://www.honeywellvideo.com)/security.
		2. Accepted Part Numbers:
			1. HFD8GR1: Network TDN Low Light IR Fisheye Camera, 1/1.7" CMOS,
			12 MP, 1.98 mm fixed fisheye lens, 3 IR LEDs, PoE, H.265.
			2. HFD6GR1: Network TDN Low Light IR Fisheye Camera, 1/1.8" CMOS,
			6 MP, 1.7 mm fixed fisheye lens, 3 IR LEDs, PoE, H.265.
	2. SYSTEM COMPONENTS
		1. 12 or 6 megapixel low light, IR indoor/outdoor IP fisheye camera, camera housing, cabling, and a web based GUI that provides complete control of camera settings and live video access.
	3. OPERATIONAL REQUIREMENTS
		1. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall meet or exceed the following camera specifications:
			1. Image Sensor:
				1. HFD8GR1: 1/1.7" 12 MP Progressive CMOS.
				2. HFD6GR1: 1/1.8" 6 MP Progressive CMOS.
			2. Total Pixels:
				1. HFD8GR1: 4000 × 3000.
				2. HFD6GR1: 3072 × 2048.
			3. Minimum Illumination:
				1. HFD8GR1:

0.01065 lux color / 0.006727 lux BW @ F2.8, 30 IRE, shutter speed 1/30.

0.01894 lux color / 0.02156 lux BW @ F2.8, 50 IRE, shutter speed 1/30.

0.01 lux color / 0 lux BW with IR LEDs on @ F2.8, long exposure.

* + - * 1. HFD6GR1:

0.02043 lux color / 0.03681 lux BW @ F2.0, 30 IRE, shutter speed 1/30.

0.06064 lux color / 0.06166 lux BW @ F2.0, 50 IRE, shutter speed 1/30.

0.01 lux color / 0 lux BW with IR LEDs on @ F2.0, long exposure.

* + - 1. Wide Dynamic Range: Digital WDR.
			2. IR Distance: Up to 25 ft (8 m), depending on scene reflectance.
			3. Backlight Compensation: BLC/HLC/DWDR.
			4. Day/Night: Auto (ICR)/Color/BW.
			5. Gain Control: Auto/Manual.
			6. Noise Reduction: 3DNR.
			7. Privacy Masking: Up to 4 areas.
			8. Electronic Shutter Speed: Auto, Manual, 1/3(4) to 1/100,000 seconds.
			9. Video Standard: NTSC/PAL.
			10. White Balance: Auto/Natural/Street Lamp/Outdoor/Customize Region.
			11. Signal-to-Noise Ratio: 50 dB.
			12. Audio Stream: Dual stream; Line In/Out.
			13. Audio Compression: G.711a/G.711Mu/AAC/G.726/MPEG2-Layer2/G.722.1/G.729.
			14. Corridor Mode: Yes.
			15. Lens:
				1. HFD8GR1: 1.98 mm fixed fisheye lens, F2.8.
				2. HFD6GR1: 1.7 mm fixed fisheye lens, F2.0.
			16. Horizontal Angle of View: 185°.
			17. Communication: ONVIF Profile S/G support.
		1. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall provide true day/night functionality with an infrared (IR) cut filter for day mode.
		2. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall provide, in high contrast lighting conditions, higher quality images and significantly better dynamic range than conventional IP cameras.
		3. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall provide up to 4 fully configurable privacy zones to mask sensitive areas of a video image.
		4. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall support three (3) installation modes to select for the installation orientation of the camera: Ceiling, Wall or Floor installation modes.
		5. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall include the following seven (7) display options to allow the user to display the 360° video in the best mode for any surveillance scenario:
			1. Original 360° Image display mode displays the entire view of the 360° image in a round image layout.
			2. Single Panorama Image display mode displays the entire view of the 360° image in a flattened panoramic layout.
			3. Double Panorama Image display mode splits the 360° image into two (2) horizontal 180° flattened panoramic layouts.
			4. Original 360° Image with Three EPTZ (virtual PTZ) Region Images display mode displays the 360° image in a quarter of the screen and three inset EPTZ region images in the other three quarters of the screen.
			5. Single Image display mode displays a single inset view from within the 360° view.
			6. Four EPTZ Region Images display mode displays four inset EPTZ region images.
			7. Two Vertical Panorama Images display mode splits the 360° image into two (2) vertical 180° flattened layouts.
		6. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall support the ONVIF Profile S/G specification for interoperability between network video products.
		7. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall include, as standard, a web based GUI that provides complete control of the camera settings. The web based GUI shall:
			1. Permit six (6) users @ 6 MP resolution at 10 Mbps in simultaneous unicast.
			2. Provide multiple user access levels with password protection.
			3. Offer video access from a web browser. The web browser shall offer live viewing for up to six (6) users @ 6 MP resolution at 10 Mbps with full-control of all camera settings available to the administrator.
			4. Be easily discovered through Honeywell IPC Config Tool or other appropriate device search tools.
			5. Be available to record streaming video or snapshot images to a PC hard disk. The administrator must have the ability to turn the recording function on or off through the web based GUI.
			6. Require the following hardware as a minimum for the web browser:
				1. Operating system: Windows 7, Windows 10
				2. Processor: Intel® Pentium® M processor, 2.16 GHz or faster
				 Intel® Core™2 Duo processor, 2.0 GHz or faster
				3. System memory (RAM): 2 GB
				4. Graphics card: AGP graphics card 64 MB RAM, DirectDraw
				5. Network card: 10Base-T (10 Mbps) or 100Base-TX (100 Mbps) operation
				6. Web browser: Microsoft Internet Explorer 11.0 or later, Firefox, Chrome
				7. Viewer: ActiveX control plug-in for Internet Explorer
		8. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall support IPv4/v6, HTTP, TCP/IP, DHCP, IGMP, DDNS, RTSP, RTP, UDP, FTP, ICMP, SMTP, PPPoE, HTTPS, SSL, UPnP, IEEE 802.1X, IP Filter, Multicast, SNMP, QoS, Bonjour, ONVIF, DNS, and NTP protocols.

NOTE TO SPECIFIER: Some development may be required in specific user cases to support some of these protocols in the field as naturally the protocols will mature over time.

* + 1. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall provide triple H.265, H.264 and/or H.264/MJPEG video streams simultaneously. The streams shall have the following functions:
			1. Main Stream:
				1. HFD8GR1: Support for 12 MP resolution (4000x3000) at 1-25 frames per second. The camera can also support lower resolutions at 1-30/25 frames per second (NTSC/PAL): 8M (2880x2880), 6M (2880x2160), 3M (2048x1536) resolutions.
				2. HFD6GR1: Support for 6 MP resolution (3072x2048) at 1-25/30 frames per second (NTSC/PAL). The camera can also support lower resolutions at 1-30/25 frames per second: 4M (2048x2048), 3M (2048x1536), UXGA (1600x1200) resolutions.
			2. Sub Stream: 1-25/30 fps D1 (704x576/704x480), CIF (352x288/352x240).
			3. Triple Stream: 1-25/30 fps 1.3M (1280x960), D1 (704x576/704x480).
			4. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera shall transmit additional H.265, H.264 or MJPEG video streams simultaneously with the primary H.265, H.264 or MJPEG stream (up to 3 streams).
			5. The bit rate for the H.265, H.264 and MJPEG streams can be set to constant or variable bit rate. The resolutions and frame rates for all streams are adjustable by the administrator.
			6. The fully featured 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera shall support three (3) H.264 profiles: High profile, Main profile, and Baseline profile.
		2. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall feature web GUI menus for programming camera parameters. A minimum of the following menus must be available:
			1. Live
			2. Playback
			3. Camera Setup
				1. Properties
				2. Profile Management
			4. Compression Setup
				1. Video
				2. Snapshot
				3. Overlay
				4. ROI
				5. Path
			5. Audio Setup
			6. Network Setup
				1. TCP/IP
				2. Connection
				3. PPPoE
				4. DDNS
				5. IP Filter
				6. SMTP (Email)
				7. UPnP
				8. SNMP
				9. Bonjour
				10. Multicast
				11. 802.1x
				12. QoS
				13. Certificate
			7. Alarm Setup
				1. Alarm
				2. Event
			8. Video Analytics
				1. Video Detection
				2. Audio Detection
			9. Storage Setup
				1. Schedule
				2. Destination
				3. Record Control
			10. System Setup
				1. General
				2. Date&Time
				3. Account
				4. Default
				5. Import/Export
				6. Auto Maintain
				7. Upgrade
			11. Information
				1. Version
				2. Log
				3. Online User
		3. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system must provide the option of restoring all displays, alarms, camera settings, and diagnostic settings to factory default with a Web GUI command. In addition, the unit shall offer a simple “reboot” with a Web GUI command.
		4. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system should provide a warning message through relay output/FTP/Email/HTTP, upload an image through FTP/Email or record video to a micro SD card/network recorder upon motion detection. The administrator must have the ability to turn the motion detection function on or off through the web GUI.
		5. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system should provide a warning message through relay output/FTP/Email, or record video to a micro SD card upon network failure detection, the minimum detecting period is 5 seconds. The administrator must have the ability to adjust the detecting period and turn the network failure detection function on or off through the web GUI.
		6. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system should provide micro SD card recording for backup when there is an event (Alarm, Motion detection, Network failure detection) or scheduling. The administrator must have the ability to turn the recording function on or off through the web GUI. The micro SD card storage size can be varied from 8 GB to 128 GB. The micro SD card can be inserted, replaced or removed by the installer or the user. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera does not come with a micro SD card installed. It is recommended to use a high quality micro SD card for recording, such as a Class 10 micro SD card.

NOTE TO SPECIFIER: IMPORTANT! Any damaged files on an installed micro SD card incurred by malfunction or error in files saved on the micro SD card, regardless of the cause, are not guaranteed by Honeywell.

* + 1. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall provide Network share recording for backup when there is an event (alarm, motion detection) or scheduling. The administrator must have the ability to turn the recording function on or off through the web GUI.
		2. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera shall include two (2) on-board alarm inputs for normally open or normally closed dry contacts.
		3. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera shall include two (2) on-board alarm output for normally open or normally closed dry contacts. The camera shall have the ability to perform the relay out signal to the alarm equipment.
		4. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera housing shall consist of die cast aluminum with a white powder coat finish (RAL9003).
		5. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera shall be available in indoor/outdoor configurations designed for installation with wall, surface, corner, pole and ceiling mount configurations The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera units include IP67 ingress protection and IK10 vandal resistance standards.
		6. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera shall be available in a pendant housing specifically designed for installation in an outdoor environment, with an integral resistive type thermostat-controlled heater and blower to maintain a sufficient operating temperature. The pendant housing shall be IP67 rated.
	1. SERIES INTEGRATIONS
		1. The following accessories are compatible with the 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera:
			1. HB4G-PM – Pole Mount Bracket
			2. HB34G-CM – Corner Mount Bracket
			3. HFG-PK – Pendant Mount Bracket
			4. HFG-WK – Wall Mount Bracket
		2. The following NVRs and Hybrid DVRs are compatible with the 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera:
			1. MAXPRO® NVR Family – Entry to Enterprise Level Network Video Recorders
			2. MAXPRO® VMS Family – Entry to Enterprise Level Network Video VMS
			3. DVM – Digital Video Manager
			4. HUS
			5. ONVIF support for interoperability between Honeywell and other manufacturer’s IP-enabled security devices.

NOTE TO SPECIFIER: Some development may be required in specific user cases to support some of these protocols in the field as they mature over time.

* 1. SYSTEM HARDWARE
		1. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall have the following mechanical specifications:
			1. Unit Dimensions (W × H): 5.9 × 2.2 inches (150.2 × 55.8 mm).
			2. Unit Weight: 1.1 lb (0.5 kg).
			3. Construction: Die-cast aluminum housing with powder coat.
		2. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall have the following electrical specifications:
			1. Input Voltage: 12 V DC +/-10%, PoE IEEE 802.3af Class 0.
			2. Power Consumption: PoE (802.3af) Class 0, 12 V DC 10 W max (IR LEDs on).
		3. The 12 and 6 MP low light, IR indoor/outdoor IP fisheye camera system shall be designed to meet the following environmental conditions:
			1. Operating temperature: –22°F (−30°C) to 140°F (60°C).
			2. Relative Humidity: Less than 95%, non-condensing.
			3. Ingress Protection: IP67.
			4. Vandal Resistance: IK10.
			5. Emissions: FCC - Part 15; CE - EN 55032; Complies with RCM (AS/NZS).
			6. Immunity: CE – EN 50130-4.
			7. Safety: North America UL Listed to UL/CSA 60950-1, CE – EN 60950-1.
			8. RoHS: EN 50581.
	2. MANUFACTURER SUPPORT
		1. Manufacturer shall provide customer service, pre-sales applications assistance, after-sales technical assistance, access to online technical support, and online training using Web conferencing.
		2. Manufacturer shall provide 24/7 technical assistance and support by means of a toll-free telephone number at no extra charge.
1. EXECUTION
	1. EXAMINATION
		1. Examine site conditions prior to installation. Notify Architect and Owner in writing if unsuitable conditions are encountered. Do not start installation until site conditions are acceptable.
	2. INSTALLATION
		1. All components of the camera system shall be thoroughly tested before shipping to the project location.
		2. Camera system shall be installed, programmed, and tested in accordance with manufacturer’s instructions and recommendations.
			1. Coordinate interfaces with other products with Owner’s representative where appropriate.
			2. Provide conduit, cable, and wire for complete and reliable installation. Obtain Owner’s approval for exact location of cameras, boxes, conduit, cable, and wiring runs prior to installation.
			3. Install conduit, cable, and wire parallel and square with building lines, including raised floor areas. Do not exceed 40 percent fill in conduits. Gather and tie wires for orderly installation.
			4. Coordinate with other trades to provide proper sequencing of installation.
	3. FIELD COMMISSIONING AND CERTIFICATION
		1. Field Commissioning: Test camera system as recommended by manufacturer, including the following:
			1. Conduct complete inspection and testing of equipment, including verification of operation with connected equipment.
			2. Test devices and demonstrate operational features for Owner’s representative and authorities having jurisdiction, as applicable.
			3. Correct deficiencies until satisfactory results are obtained.
			4. Submit written copies of test results.
	4. TRAINING
		1. Conduct on-site system administrator and security/surveillance operator training in accordance with the manufacturer’s instructions and recommendations. Training shall include, but not be limited to: camera administration, provisioning, configuration, operation, and diagnostics.

 END OF SECTION