
Note to the Designer/Architect/Engineer: These Specifications are basic minimum criteria to be met in preparing the final project specifications for this section, which is the responsibility of the Designer

York University Building Standards

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Prepared by: Paul Mayol, Project Manager, Office of the Vice President Finance and Administration	Reviewed by: Scott Bagley, Coordinator, CCTV & Door Access Technology, Security Services, CSBO. Tony Manza, Project Manager, Infrastructure Project Administration, UIT	Authorized by: Richard Francki, Assistant Vice President Campus Services and Business Operations Date Document Authorized: May 24, 2012 Revisions: September 30, 2015 November 7, 2017
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1.0 GENERAL

1.1 SCOPE OF WORK

Closed Circuit Television systems (CCTV)

1.2 GUIDING PRINCIPLES:

1.2.1 Closed Circuit Television (CCTV) cameras are strategically located in parking lots, pedestrian tunnels, the York Lanes retail mall, computer labs and other areas of the university. These cameras are monitored twenty-four hours a day by student CCTV operators and Security Services staff who work in conjunction with the Security Control Centre officer. Cameras are also used tactically in conjunction with Blue Light Emergency Phone calls and security officer response to reported incidents. In addition to the crime prevention benefits, CCTV cameras provide an in-colour video recording of incidents that can be utilized for investigation purposes

1.3 RELATED YORK UNIVERSITY STANDARDS

- 1.3.1 Division 27 05 05 Communication Rooms
- 1.3.2 Division 27 15 00 Horizontal Cabling
- 1.3.3 Division 27 21 33 Data Comm WiFi AP
- 1.3.4 Division 27 – 01 Communication and Network Symbols
- 1.3.5 Division 27 – 02 WiFi Symbols
- 1.3.6 Division 27 – 03 Communication Room Layout Shell
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- 1.3.9 Division 27 – 08 Pigtails
- 1.3.10 Division 27- 09 Connectivity Schematics
- 1.3.11 Division 27-10 Permanent Link Test
- 1.3.12 Division 27-11 Faceplates

1.4 REFERENCES

- 1.4.1 All installed equipment must meet most recent applicable CSA/ANSI standards
- 1.4.2 All cables must adhere to applicable NF standards
- 1.4.3 ULC Standards
- 1.4.4 Ontario Building Code
- 1.4.5 Canadian and Ontario Electrical Code
- 1.4.6 CSA z85 Abbreviations for Scientific and Engineering Terms
- 1.4.7 Ontario Electrical Safety Code Bulletins (in force at the time of system installation)
- 1.4.8 Open Network Video Interface Forum (ONVIF)

1.5 POWER REQUIREMENTS

- 1.5.1 24 VDC or POE

1.6 DEVICE SUPERVISION

- 1.6.1 An alarm shall occur if any system connections are cut, removed or tampered with, the system shall detect and annunciate the conditions even if the device has been shunted (disarmed).

1.7 LIGHTENING PROTECTION

- 1.7.1 Lightning protection must be installed for exterior mounted fixed and PTZ cameras
- 1.7.2 Lightning protection must be installed at the building entrance or communications room entrance for any external communication wiring

1.8 TAMPER PROTECTION

- 1.8.1 Access control controller devices shall be so designed, constructed and installed as to resist attack and to minimize vulnerability to countermeasures. The system shall be so designed so that it will be difficult to "jumper out" or by-pass sections, loops or devices of the system.
- 1.8.2 All electronic components and points-of-connection shall be contained within a metal panel suitable for wall mounting. Panel doors shall have locks, keyed to match other portions of the system already in use. Tamper resistant screws shall be used and a copy of each tool used will be supplied to the university as a final deliverable.

1.9 WARRANTY (STANDARD WARRANTY AND EXTENDED WARRANTY)

- 1.9.1 Provide warranty on both product and installation for a period of two years from the date of system acceptance in writing from York University. This 24-month warranty period shall include both the replacement of failed component and the labour required to replace that component. Warranty service will be available 24 (twenty-four) hours a day 7(seven) days a week 365 (three hundred and sixty-five) days a year including all statutory holidays.

1.10 SUBMITTALS

- 1.10.1 Shop drawings and equipment technical sheets indicating the complete system design, and all components shall be submitted as a package for approval prior to release of order or installation. As a minimum, the shop drawings shall include a floor plan of the installation area, a wiring diagram indicating all components connected and the number type and size of the conductors between each component. Contractor shall also provide information on type of cabling used, cross connect, cable, port and name of devices according to York University's naming convention. Technical information sheets (or Cut Sheets) of each piece of equipment shall be included in the shop drawing submittal package.

- 1.10.2 Three hard copies and one set of electronic files of the "as built" record drawings

shall be provided to the University upon completion of the work. The drawings shall reflect the final "as built" arrangement and configuration of the system. They shall be accompanied by illustrated technical supporting literature on all equipment comprising the installation including operating and maintenance instructions for all components.

- 1.10.3 As built drawings and wiring diagrams shall be produced by AutoCad version 2010 (earlier version such 2008, 2009 are also acceptable) and supplied to York University's Planning & Architecture Design Services, Campus Services and Business Operations, and Infrastructure Operations, UIT on disk.
- 1.10.4 Shop drawing to include a complete materials list with manufacturer, style, model and quantity.

1.11 QUALIFICATIONS

- 1.11.1 The installer of electronic hardware must be a firm with at least 5 years' experience with these types of products, have manufacturers' references and a good knowledge of the products specified.
- 1.11.2 No technician will be given access to the servers, NVRs or workstations unless York University security has a copy of their Honeywell MaxPro certification on file.

2.0 PRODUCTS

2.1 CCTV Cameras

2.1.1 DEVICE LOCATION

2.1.1.1 Video surveillance cameras shall generally be installed in common space areas both internally and externally to a building normally accessed by students, staff, faculty and visitors. These areas include but are not limited to the following:

- .1 Building entrances/exits
- .2 Food courts
- .3 Common study areas
- .4 Loading docks
- .5 Pedestrian pathways leading to and away from the building
- .6 Public transit stops
- .7 Elevators
- .8 Any area that, after a review of the proposed building floor plan and intended space use, the Coordinator, CCTV and Access Control, Security Services deems should to require video surveillance in an effort to protect the safety of the University community and property

- 2.1.1.2 Normally, installed indoors in corridors, common areas for general surveillance
Fixed cameras are also installed in classrooms and/or labs where high value content exists. Fixed cameras are ceiling mounted, and in some cases wall mounted. Ceiling or wall mounted, vandal resistant smoke dome housing is required.
- 2.1.1.3 CCTV cameras shall be installed either wall or ceiling mounted for indoor/outdoor applications. For outdoor applications pole mounted is also acceptable depending on circumstances
- 2.1.1.4 All mounts will be of commercial grade and be commercial off the shelf. Custom mounts will only be accepted with written approval from York University
- 2.1.1.5 In an effort to reduce glare and light distortion, CCTV camera shall be faced away from available light source

2.1.2 POLE MOUNTED CAMERAS

- 2.1.2.1 Pole height shall be dependent of specific applications and circumstances, project representative shall consult Coordinator CCTV and Door Access Technology, Security Services, CSBO
- 2.1.2.2 Poles shall not be wood
- 2.1.2.3 Emergency telephone tall pedestal mounted CCTV cameras at a minimum, shall have the following features:
 - 1. Housing must be rated IP66 or better
 - 2. Must be PTZ
 - 3. 30x optical zoom, 16x digital
 - 4. Not POE powered
 - 5. Ultralow light to 0.005lux colour and 0.0005 lux (B/W)
 - 6. Housing must be IK10 or better impact/vandal resistant
 - 7. Refer to installation diagram attached
- 2.1.2.4 Refer to CCTV Mounting Schematics
- 2.1.2.5 Light standard mounted cameras
Refer to installation diagram attached
- 2.1.2.6 Exterior wall mounted applications
Refer to installation diagram attached
- 2.1.2.7 Exterior wall mounted outside corner application
Refer to installation diagram attached
- 2.1.2.8 Pendant mounted application
Refer to installation diagram attached
- 2.1.2.9 Parapet mounted application
Refer to installation diagram attached
- 2.1.2.10 Roof top deck mounted application
Refer to installation diagram attached
- 2.1.2.11 Roof mounted ballast loaded application
Refer to installation diagram attached

2.1.2 WIRING

- 2.1.2.1 Number 18 (minimum FT4 rated) wire for power (if needed)
- 2.1.2.2 For network applications Beldon Cat 6E (minimum FT4 rated)

2.1.3 DEVICE FEATURES

- 2.1.3.1 Fixed, multi angle and PTZ cameras must be IP-based and shall be compliant with latest iteration of ONVIF standard for such devices
- 2.1.3.2 Fixed, multi angle and PTZ IP-based cameras shall be interoperable with Honeywell MaxPro NVRs as well as other branded NVRs
- 2.1.3.3 Fixed, multi angle and PTZ IP-Based cameras shall be capable of being controlled via mouse or Honeywell control/joystick
- 2.1.3.4 Fixed high-resolution colour camera installed in a vandal proof smoke dome housing (IK10 or better rating). Camera shall have a day/night capabilities and minimum lens dimension that is dependent on specific application.
- 2.1.3.5 weather resistant housing (IP66 or better)
- 2.1.3.6 High-resolution PTZ camera with day and night operation and an optical zoom lens, having wide dynamic range
- 2.1.3.7 POE as primary power supply and if needed 24 VAC (if needed) or POE +, ++ depending on requirement
- 2.1.3.8 Ultralow light to 0.005lux colour and 0.0005 lux (B/W)
 - .1 Backlight compensation
 - .2 Adjustable white balance
 - .3 Automatic grain control
 - .4 Automatic iris,

2.1.4 IP based cameras fixed or PTZ shall at least these features at a minimum:

- 2.1.4.1 Viewing and recording at 1080p (1920 X 1080) resolution @ 30 frames per second (for PTZ ...through a continuous 360° pan rotation, minimum 220°
- 2.1.4.2 SD/SDHC slot for local storage that will be used if network connectivity is lost. An SD card of the maximum compatible capacity will be installed and configured
- 2.1.4.3 Ability to support multiple video streams
- 2.1.4.4 Video stream compression capability to MJPEG and H.264
- 2.1.4.5 ½.8-inch CMOS for increased sensitivity
- 2.1.4.6 low light technology that allows the cameras to compensate for low light conditions
- 2.1.4.7 built-in motion detection and advanced wide dynamic range (WDR)
- 2.1.4.8 operating temperatures AC 24V: -40°C to 55°C, POE -40° to 55°C

2.1.5 OTHER TYPES OF CAMERA TECHNOLOGIES

2.1.5.1 Other camera types not discussed above maybe considered and installed as needed, specifications will be provided by the Coordinator, CCTV and Door Access Technology in writing prior to the procurement process.

2.2 VIDEO RECORDER (NETWORK VIDEO RECORDER NVR)

2.2.1 DEVICE LOCATION

- 2.2.2.1 Unless otherwise instructed by the York University project coordinator, The network video recorders shall be located in The Stacie Science & Engineering Library Data Centre

2.2.2 DEVICE FEATURES

- 2.2.2.1 The IP video streams shall be managed by a network video recorder (NVR) that is fully compatible with Honeywell MaxPro Video Management System
- 2.2.2.2 The NVR will serve as the virtual matrix switch for the routing of video to the various monitors in the York University Security Control Centre located at the William Small Centre.
- 2.2.2.3 the NVR will provide the storage solution for the video files
- 2.2.2.4 The NVR storage shall support recording all video at no less than 8 frames per second for fixed cameras and, 24 hours/7days a week at a minimum resolution of 4CIF.
- 2.2.2.5 The digital video shall be stored for a period of 30 days.
- 2.2.2.6 Data storage for NVR shall support a minimum of 35 days of video, providing a 5 days buffer before FIFO (first in first out) video is deleted.
- 2.2.2.7 In order to comply with data protection requirements NVRs must be able to store recorded video on hard disk for a specified number of days and then delete recordings older than the specified time limit,
- 2.2.2.8 NVRs must have a mode of operation whereby they record until full and then stop recording in order to preserve the recorded footage.
- 2.2.2.9 Administrators must be able to protect individual recordings from deletion for use as evidence.
- 2.2.2.10 The quality of live images shall be at least 3 megapixels resolution at a rate of 15 frames per second per camera using a low compression factor;
- 2.2.2.11 The quality of stored images shall be at least 3 megapixels resolution at a rate of 8 frames per second per fixed cameras and 15 frames per second for mobile cameras using a low compression factor.
- 2.2.2.12 The NVR must also record Alarms as well as video and audio from selected Transmitters/Receivers. The NVR must act as central storage for Alarms so that when one Security Control Center station acknowledges an alarm, all of the other stations will see that it has been acknowledged
- 2.2.2.13 It must be possible to record the same IP Camera or Transmitter on multiple NVR.
- 2.2.2.14 NVR must automatically manage free disk space by deleting recordings older than the specified number of days or when a minimum disk space threshold is met.
- 2.2.2.15 NVR must allow a video thinning threshold to be set whereby after a specified time, recorded video is thinned down to just the I-frames.
- 2.2.2.16 It must be possible to start recordings based on the following conditions:
- 2.2.2.16.1 Start on receipt of Alarm from a Transmitter for a set duration of time.

- 2.2.2.16.2 Set to run continuously 24 x 7 x 365
- 2.2.2.16.3 Time scheduled using start and stop time at the same time on selected days of the week.
- 2.2.2.16.4 Time scheduled by starting at a specific time on a specific day and recording 24 hours every day until a specific stop time on a specific day. E.g. Start Monday 09:00 and stop Friday 18:00
- 2.2.2.16.5 Start based on a manual operator requesting a recording
- 2.2.2.16.6 The clock on the video server / NVR shall be synchronized with a network time server as well as with all other security systems and shall automatically adjust to the seasonal time change. UIT operates a number of diverse and redundant NTP servers. These are available to any/all on-campus servers and applications which require time synchronization.

2.3 VIDEO MANAGEMENT SYSTEM (VMS)

- 2.3.1 The Video Management System used by York University is the Honeywell MAXPRO Video Management System (VMS), any cameras, data storage solution, NVRs, encoder, decoder and any other device must be proven to be 100% compatible with this VMS.
- 2.3.2 A video management system, NVR, CCTV camera, encoder, decoder or other video surveillance device that is not 100% compatible with the Honeywell MAXPRO VMS is not acceptable, The MAXPRO VMS has the following features:
- 2.3.3 The MAXPRO VMS provides the ability to view multiple cameras from a single point (security Control Centre) while recording functions are in effect
- 2.3.4 Begin real-time recording of designated pre-set alarm positions under an alarm condition
- 2.3.5 Real time recording is 15 fps for 1 minute pre-alarm and 5 minutes post-alarm. For calculating storage requirements, the security contractor shall assume 60 alarm conditions within a 30-day time frame (video storage requirement).
- 2.3.6 Should a hard drive fail, the hard drive can be removed (in a hot unit condition) and a new hard drive installed (in a hot condition)
- 2.3.7 When the new hard drive is installed, the CCTV it automatically formats the hard drive to meet the configuration requirements of the CCTV.
- 2.3.8 Once the hard drive is formatted, the CCTV automatically copies the video lost from the mirrored hard drive to the new hard drive.
- 2.3.9 Once complete, the video is automatically recorded to both units. Technical solutions that do not necessarily utilize hard drives may be considered as alternative options.
- 2.3.10 VMS permits Role-based operator privileges
- 2.3.12 Auto discovery of any ONVIF compliant IP-based PTZ, multi angle or Fixed cameras
- 2.3.13 Ability to define and run macros to run preset operations

- 2.3.14 Surrounding camera mode to permit following of subjects of interest across multiple cameras
- 2.3.15 Ability to search video recordings through event view and time stamping
- 2.3.16 Ability to block out segments of field of view from a camera(s) privacy screen
- 2.3.17 Video search via keyboard or client software.
- 2.3.18 The system software configuration integrates the following video surveillance functionalities:
 - 2.3.18.1 The operator shall be capable of ultimately selecting any number of cameras on a single monitor either in an of the following configurations, full screen, 2x2, 3x3, 4x4 or various combinations of various size images
 - 2.3.18.2 Simultaneously allow for real time and playback viewing during system recording and programming
 - 2.3.18.3 Process signals from digital cameras
 - 2.3.18.4 Remotely access in-camera menu in order to modify the camera settings
 - 2.3.18.5 Support a configuration and compression format that reduces bandwidth usage and increases archiving time without unreasonably sacrificing the quality of the received information
 - 2.3.18.6 Program video motion detection in order to optimize video recording periods. Video motion detection must be programmable in order to allow time schedule activation, sensitivity calibration and the selection of specific detection zones
 - 2.3.18.7 The capacity to restrict access to system functions based on programmable levels of priority and user passwords
 - 2.3.18.8 Include a watermark signature (protection against falsification)
 - 2.3.18.9 Allow video surveillance management and operation throughout the entire site from a security workstation using single video management software. Workstation: one in Admin suite, one in operations office
- 2.3.19 Acceptable Products: Honeywell MAXPRO Network Video Recorder (NVR) PE (Professional Edition) and any other NVR that is proven to be 100% compatible with the Honeywell MAXPRO Video Management System

2.4 DIGITAL VIDEO (DATA) STORAGE

- 2.4.1 Data storage must allow for sufficient storage capacity according to the proposed camera quantities in relation with the performance objectives described herein.
- 2.4.2 On board data storage capacity must be scalable allowing easy expansion of storage capacity as required
- 2.4.3 In the event of a partial failure of a storage device, the continuity of operations is to be ensured by a proper configuration to prevent any loss of data; data to be capable of being backed up either locally at each

digital camera using a small local storage device such as SD cards or, on a remote server. There shall be a power back-up of on-site data storage of 8 hours.

- 2.4.4 The system shall detect a video loss signal and generate an alert signal. The alert signal shall be an audible notification at the point of monitoring and the video displayed for that camera shall be a solid blue screen with "NO VIDEO SIGNAL" displayed centered both horizontally and vertically.

2.5 VIDEO SURVEILLANCE CAMERAS

2.5.1 FIXED IP DOME CAMERA AT A MINIMUM

- 2.5.1.1 Exterior fixed colour camera, IP, minimum 3 of megapixels, day/night mode capacity, with video masking and backlight compensation capability, including auto iris and variable focal distance lens in a vandal and weather resistant clear dome housing with inside lining to hide the position of the lens without impairing the vision and heater. The camera shall have and integrated 3-9mm, Φ 14mm Mount, megapixel IR corrected vari-focal lens with F1.2 P- Iris lens and horizontal field of view of 29°-87°
- 2.5.1.2 The camera shall utilize a high sensitivity 3 Megapixel minimum CMOS sensor with 1/3.2" optical format
- 2.5.1.3 The camera shall have a dome enclosure with IP66 for water and dust protection
- 2.5.1.4 The camera dome chassis shall be vandal resistant constructed of aluminum with a 4" polycarbonate dome bubble with IK10 impact rating
- 2.5.1.5 The camera shall have a 3-axis gimbal with 360° pan, 90° tilt and 180° Z-rotation for easy and accurate positioning.
- 2.5.1.6 Camera shall have the ability for an operator to remotely access the in-camera menu
- 2.5.1.7 The camera shall have dual standard compression support with simultaneous streaming of both H.264 and MJPEG formats
- 2.5.1.8 The camera shall be fully compatible with the latest version PSIA and ONVIF industry standard at time of installation and passes conformance tests
- 2.5.1.9 The camera shall have privacy masking, the ability to select multiple regions of an arbitrary shape to block the video. This feature will support HTTP and TFTP protocols, as well as the on-camera web interface
- 2.5.1.10 The camera shall have extended motion detection grid, a higher granularity grid of 1024 distinct motion detection. User can select between 64 zone based motion detection and extended motion detection to provide backward compatibility with the existing Video Management System (VMS) integration. This feature will support HTTP and TFTP, as well as the on-camera web interface
- 2.5.1.11 The camera shall be able to be cropped to any resolution divisible by 2 and maintain H.264 compression

- 2.5.1.12 The camera shall have multi-streaming support of up to 8 non-identical concurrent streams (different frame rate, bit rate, resolution, quality, and compression format)
- 2.5.1.13 The camera shall output at a maximum resolution of 2048(H) x 1536(V) pixels at a maximum frame rate of 21 frames per second (FPS)
- 2.5.1.14 It shall be possible to program the camera to output a variety of lower resolution images, i.e. 1920(H) x 1080(V) pixels at 30 FPS
- 2.5.1.15 It shall be possible to program the camera at binning mode to improve low light performance and output a variety of lower resolution image, i.e. 1024(H) x 768 (V) pixels at 21 FPS or 960(H) x 540 (V) pixels at 31 FPS
- 2.5.1.16 The camera's shutter speed shall be 1ms - 500ms.
- 2.5.1.17 The camera shall feature streaming of the full field of view (FOV) and simultaneous multiple regions of interest (ROI) for forensic zooming

- 2.5.1.18 The camera shall be equipped with a 100/1000 Mbps LAN connector
- 2.5.1.19 The camera shall support a minimum HTTP1.0, HTTP1.1, RTSP, RTP over TCP, RTP over UDP and TFTP network protocols
- 2.5.1.20 The camera shall feature automatic exposure, automatic multi-matrix white balance, shutter speed control, 50/60Hz selectable flicker control, programmable brightness, saturation, gamma, sharpness, windowing and decimation, simultaneous delivery of full-field view and zoomed images at video frame rate, instantaneous electronic zoom, pan and tilt, and electronic image rotation by 180 degrees
- 2.5.1.21 The camera shall incorporate necessary algorithms and circuits to detect motion in low light with clarity
- 2.5.1.22 The camera shall support a minimum illumination of Ultralow light to 0.005lux colour and 0.0005 lux (B/W)
- 2.5.1.23 The camera shall support an IR sensitive minimum illumination of 0 Lux in B/W mode
- 2.5.1.24 The camera shall contain IR LED board with 24 pcs 850nm IR LEDs, 15 meter IR distance, 40° IR angle without any external power input. (IR version)
- 2.5.1.25 The camera's operating ambient temperature shall be -40°C (-40°F) to 50°C (122°F), stable image temperature is 0°C (32 °F) to +50°C (122°F); storage temperature -40°C (-40°F) to 60°C (140 °F) at the humidity 0% to 90% (non-condensing)
- 2.5.1.26 The camera shall bear CE mark and be UL listed

2.5.2 PAN/TILT/ZOOM IP CAMERA AT A MINIMUM

- 2.5.2.1 The camera shall utilize a high sensitivity, day/night, wide dynamic range, 3 Megapixel CMOS sensor with 1/3.2" optical format.
- 2.5.2.2 Zoom: 22x optical (minimum) + 12x digital Lens: 4.5mm to 80mm, F1.6 to F3.5, Auto focus with manual override
- 2.5.2.3 Scan Mode: Progressive
- 2.5.2.4 Compression type: H.264, H.265 and Motion JPEG

- 2.5.2.5 Shutter/Iris/Focus: Automatic with manual override
- 2.5.2.6 Day/Night Capable: Yes
- 2.5.2.7 IR Cut Filter: Mechanical
- 2.5.2.8 Manual Shutter Speeds: 1 to 1/10000 sec
Presets: 100 (minimum)
- 2.5.2.9 Preset Accuracy: 0.1°
- 2.5.2.10 Pan Range: 360° continuous rotation
- 2.5.2.11 Tilt Range: -2° (above horizontal) to 90° (vertically down)
- 2.5.2.12 Pan/Tilt Preset Speed: 280°/s (pan) and 160°/s (tilt)
- 2.5.2.13 Multi-streaming: 2 non-identical streams (minimum)
- 2.5.2.14 The camera shall have a dome enclosure with minimum rating of IP66 for water and dust protection
- 2.5.2.15 The camera dome chassis shall be vandal resistant constructed of aluminum with a 4" polycarbonate dome bubble with IK10 impact rating
- 2.5.2.16 The camera shall have a 3-axis gimbal with 360° pan, 90° tilt and 180° Z-rotation for easy and accurate positioning
- 2.5.2.17 The camera shall have dual standard compression support with simultaneous streaming of both H.264 and MJPEG formats
- 2.5.2.18 The camera is fully compatible with PSIA and ONVIF industry standard and passes conformance tests
- 2.5.2.19 The camera shall have privacy masking, the ability to select multiple regions of an arbitrary shape to block the video. This feature will support both HTTP and TFTP protocols, as well as the on-camera web interface
- 2.5.2.20 The camera shall have extended motion detection grid, a higher granularity grid of 1024 distinct motion detection. User can select between 64 zone based motion detection and extended motion detection to provide backward compatibility with the existing Video Management System (VMS) integration. This feature will support HTTP and TFTP, as well as the on-camera web interface
- 2.5.2.21 The camera shall be able to be cropped to any resolution divisible by 2 and maintain a minimum of H.264 compression
- 2.5.2.22 The camera shall have multi-streaming support of up to 8 non-identical concurrent streams (different frame rate, bit rate, resolution, quality, and compression format)
- 2.5.2.23 The camera shall output at a maximum resolution of 2048(H) x 1536(V) pixels at a maximum frame rate of 21 frames per second (FPS)
- 2.5.2.24 It shall be possible to program the camera to output a variety of lower resolution images, i.e. 1920(H) x 1080(V) pixels at 30 FPS
- 2.5.2.25 It shall be possible to program the camera at binning mode to improve low light performance and output a variety of lower resolution image, i.e. 1024(H) x 768(V) pixels at 21 FPS, or 960(H) x 540(V) pixels at 31 FPS
- 2.5.2.26 The camera's shutter speed shall be 1ms - 500ms.
- 2.5.2.27 The camera shall feature streaming of the full field of view (FOV) and simultaneous multiple regions of interest (ROI) for forensic zooming
- 2.5.2.28 The camera shall be equipped with a 100 Mbps LAN connector
- 2.5.2.29 The camera shall provide 21 levels of compression quality for optimal viewing and archiving
- 2.5.2.30 The camera shall support a minimum HTTP1.0, HTTP1.1, RTSP, RTP over TCP, RTP over UDP and TFTP network protocols

- 2.5.2.31 The camera shall feature automatic exposure, automatic multi-matrix white balance, shutter speed control, 50/60Hz selectable flicker control, programmable brightness, saturation, gamma, sharpness, windowing and decimation, simultaneous delivery of full-field view and zoomed images at video frame rate, instantaneous electronic zoom, pan and tilt, and electronic image rotation by 180 degrees.
 - 2.5.2.32 The camera shall incorporate necessary algorithms and circuits to detect motion in low light with clarity
 - 2.5.2.33 The camera shall support a minimum illumination of 0.3 Lux @ F1.2 in color non-binning mode and 0.15 Lux @ F1.2 in color binning mode
 - 2.5.2.34 The camera shall support an IR sensitive minimum illumination of 0 Lux in B/W mode 850nm IR LEDs, 15 meter IR distance, 40° IR angle without any external power input. (IR version)
 - 2.5.2.35 The camera's operating ambient temperature shall be -40°C (-40°F) to 50°C (122°F), stable image temperature is 0°C (32 °F) to +50°C (122°F); storage temperature -40°C (-40°F) to 60°C (140 °F) at the humidity 0% to 90% (non-condensing)
 - 2.5.2.36 The camera shall bear CE mark and be UL
 - 2.5.2.37 Camera shall have the ability for an operator to remotely access the in- camera menu
- 2.5.3 Other camera types requirements may be specified in writing by the York University Coordinator, CCTV and Door Access Technology or their designate in writing as special applications require.
- 2.5.4 These special applications will be specified in writing by the Coordinator CCTV and Door Access Technology.

3.0 EXECUTION

3.1 GENERAL

- 3.1.1 Cable sizing, installation, identification and termination shall be provided in accordance with the manufacturer's technical installation guidance, in addition to applicable codes
- 3.1.2 Where manufacturer's technical instructions do not cover installation or wiring selection, contractor shall ensure that the cable selected meets all technical requirements of the equipment to be installed
- 3.1.3 The CCTV camera system power, video and data shall be run in conduit in a neat and professional manner trying to best hide the conduit and wiring.
- 3.1.4 Conduit is only needed where wires must be protected from environment or tampering by the general public.
- 3.1.5 The network switch (provided by York University's UIT department) shall be POE complaint and provide IEEE 802.3at (up to 30W) power to each the fixed camera.

- 3.1.6 Network access ports on the switch shall support 10/100/1000 Base T will transmit the video signals across the university VLAN between video storage units, monitors, workstations, etc.
- 3.1.7 For PTZ (pan/tilt/zoom) cameras, an additional low voltage power source will be provided
- 3.1.8 CCTV system contractor shall provide full system programming, graphical user interface, system testing, validation, and commissioning.
- 3.1.9 The CCTV system contractor shall provide all necessary system programming and testing such that York University inherits a fully functioning stand-alone system that meets the design intent. CCTV system shall be tested prior to connection to the York University Private Security Network
- 3.1.10 All system programming variables shall be programmed to the University's documented requirements and applicable standards
- 3.1.11 The video surveillance system shall include all housings (where external housing is required, these shall be weather resistant), connectors, adapters, and terminations necessary for the interconnection of the television system. The Contractor shall also supply and install all cabling necessary to interconnect the video equipment installed at the VSS monitoring location York University Security Control Centre and the alternate Security Centre.
- 3.1.12 The Video System shall consist of all Cameras, Camera identifiers, Titlers, Monitors, Lenses, Controls, Storage Devices, Servers, Mounts, Housings, and Video Transmission Systems necessary for fully operational system.

3.2 COORDINATION

- .1 It is the CCTV system contractor's responsibility to coordinate all work with device manufacturer, local distributors, CSBO Planning and Renovations, Security Services and relevant University Information Technology departments

3.3 INSTALLATION

- 3.3.1 Install all equipment per manufacturer's documented specifications
- 3.3.2 Install all equipment in accordance with applicable standards
- 3.3.3 Refer to attached typical installation schematics SK1 for Tall Pedestal Emergency Telephone CCTV camera installation
- 3.3.4 Refer to attached typical installation schematics SK2 for Pole Mounted CCTV camera installation
- 3.3.5 Refer to attached typical installation schematics SK3 for Wall Mounted CCTV camera installation
- 3.3.6 Refer to attached typical installation schematics SK4 for Wall Mounted Type Outside Corner Camera Mount
- 3.3.7 Refer to attached typical installation schematics SK5 for Soffit Mounted Pendant Type Camera Mount

- 3.3.8 Refer to attached typical installation schematics SK6 for Roof Top Mounted, Parapet Type Camera Mount
- 3.3.9 Refer to attached typical installation schematics SK7 for Roof Top Mounted, Deck Type Camera Mount
- 3.3.10 Refer to attached typical installation schematics SK8 for Roof Top Mounted, Ballast Loaded Camera Mount

3.4 SYSTEM TESTING VERIFICATION AND ADJUSTMENTS

- 3.4.1 Final system acceptance tests shall be performed in the presence of representatives from York University Security Services, including at a minimum the Manager Security Operations, York University Security Services, the Coordinator, CCTV & Door Access Technology and representatives from University Information Technology.
- 3.4.1.1 Commissioning will be scheduled at the convince of York University Commissioning will not take place on a Friday or similar day before a statutory holiday or school shut-down
- 3.4.2 Commissioning will be scheduled to start in the morning unless approved by the Coordinator CCTV and Door Access Technology in writing
- 3.4.3 Acceptance testing and training shall include discussion on the system design with the building's Card Access Coordinators, testing of all individual components, programming of the system software and acceptance of the installation.
- 3.4.4 Final system acceptance shall include the delivery of system training by installer, system product manuals, and training manuals, tamper proof keys, cabinet keys, and passwords.

End of Section

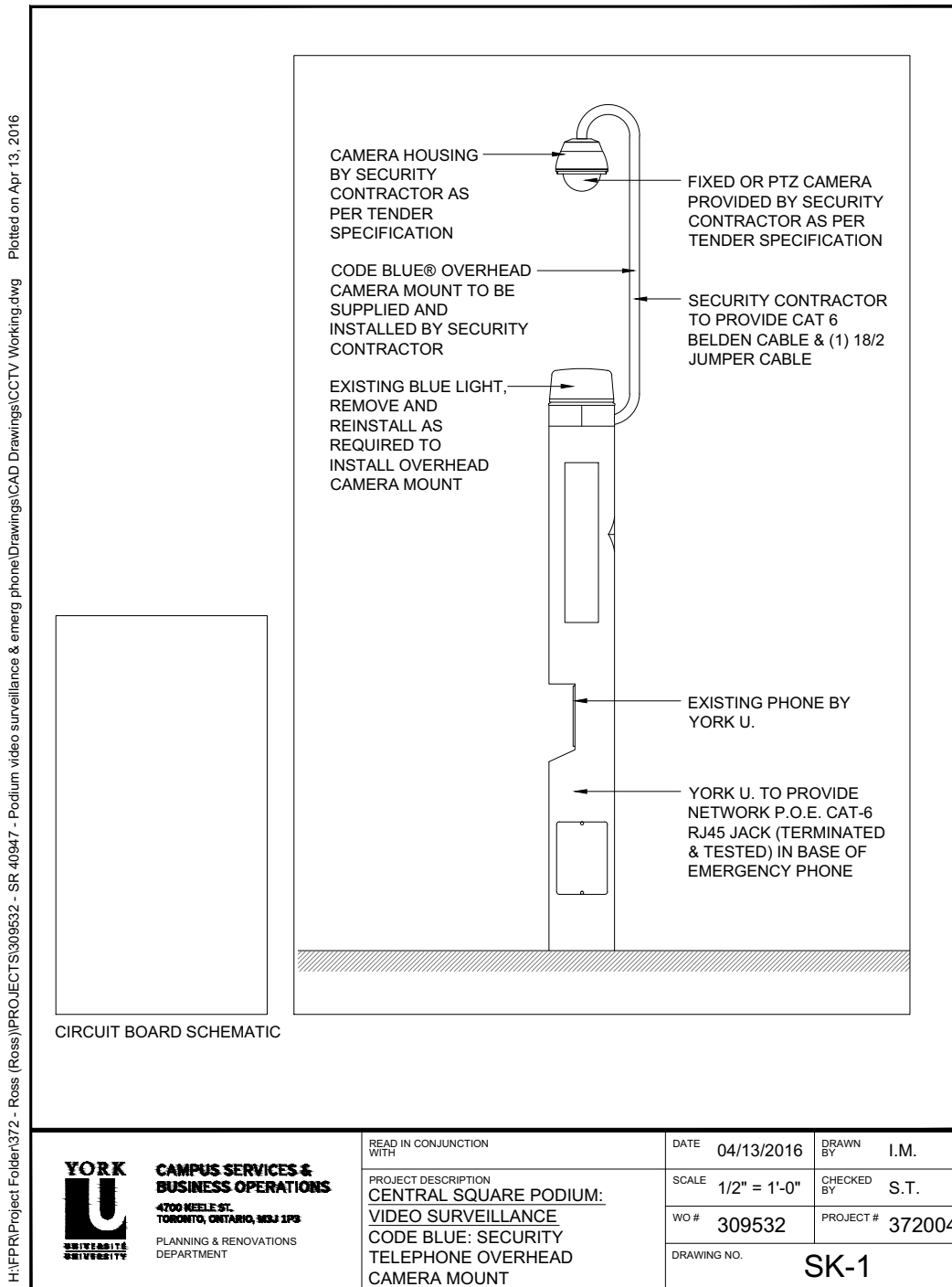
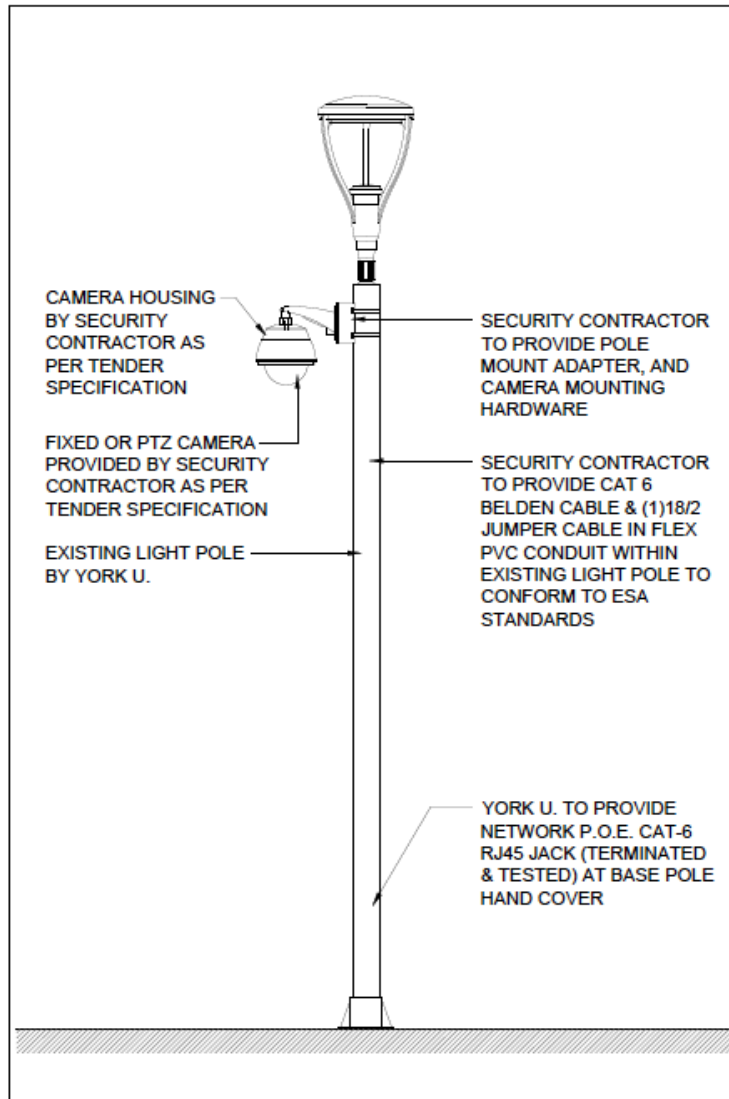


FIGURE SK1 CCTV CAMERA INSTALLATION ON TALL PEDESTAL EMERGENCY TELEPHONE

H:\FPR\Project Folder\372 - Ross (Ross)\PROJECTS\309532 - SR 40947 - Podium video surveillance & emerg phone\CAD Drawings\CCTV Working.dwg Plotted on Apr 13, 2016




 CAMPUS SERVICES & BUSINESS OPERATIONS 4700 KEELE ST. TORONTO, ONTARIO, M3J 1P3 PLANNING & RENOVATIONS DEPARTMENT	READ IN CONJUNCTION WITH	DATE 04/13/2016	DRAWN BY I.M.
	PROJECT DESCRIPTION CENTRAL SQUARE PODIUM: VIDEO SURVEILLANCE POLE MOUNTED TYPE CAMERA MOUNT	SCALE 1/2"=1'-0"	CHECKED BY S.T.
		WO # 309532	PROJECT # 372004
		DRAWING NO. SK-2	

FIGURE SK2 CCTV INSTALLATION POLE MOUNTED CAMERA

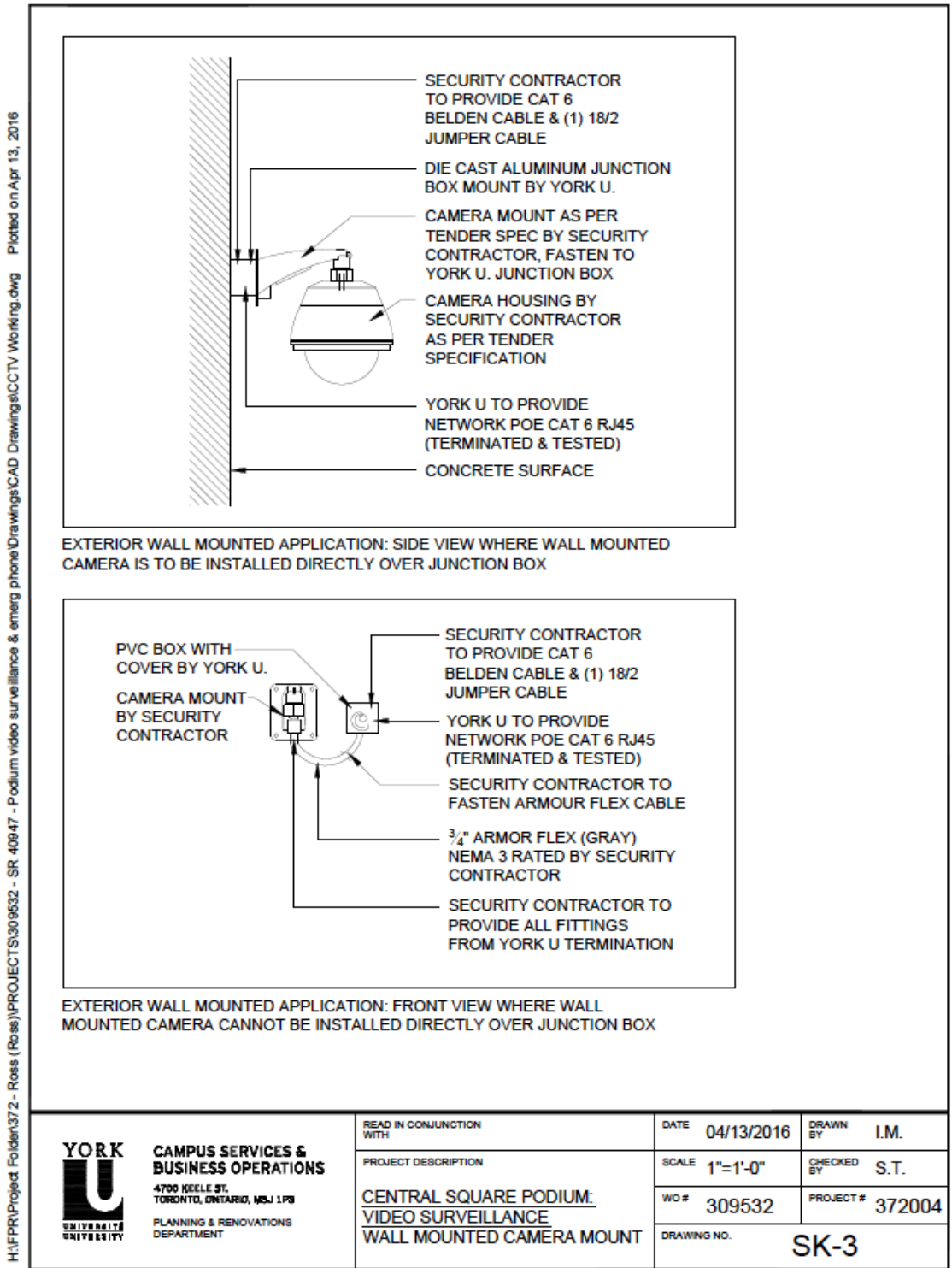


FIGURE SK 3 CCTV CAMERA INSTALLATION WALL MOUNTED CAMERA MOUNT

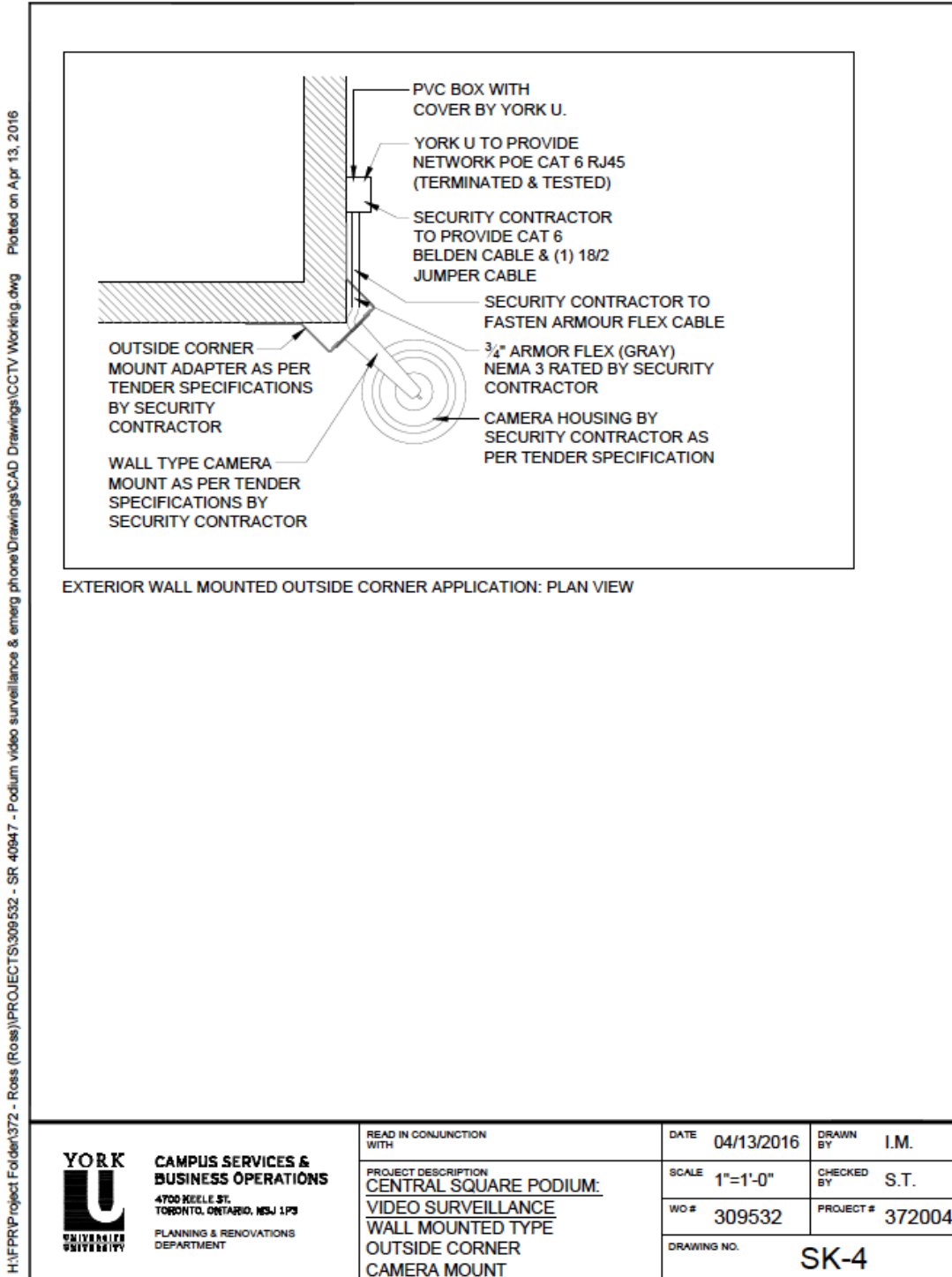


FIGURE SK4 CCTV CAMERA WALL MOUNTED OUTSIDE CORNER CAMERA MOUNT

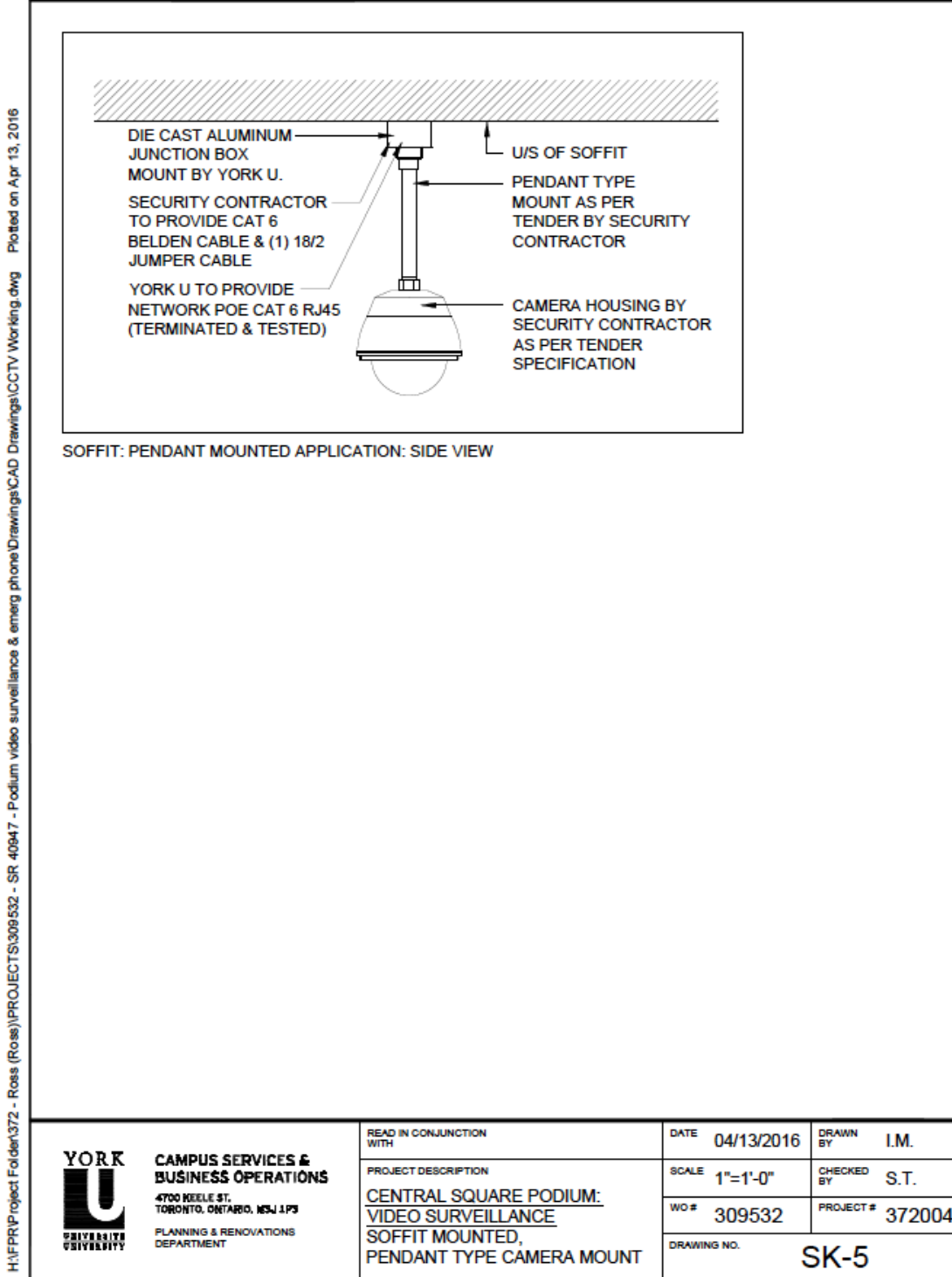


FIGURE SK 5 CCTV CAMERA MOUNT SOFFIT MOUNTED CAMERA

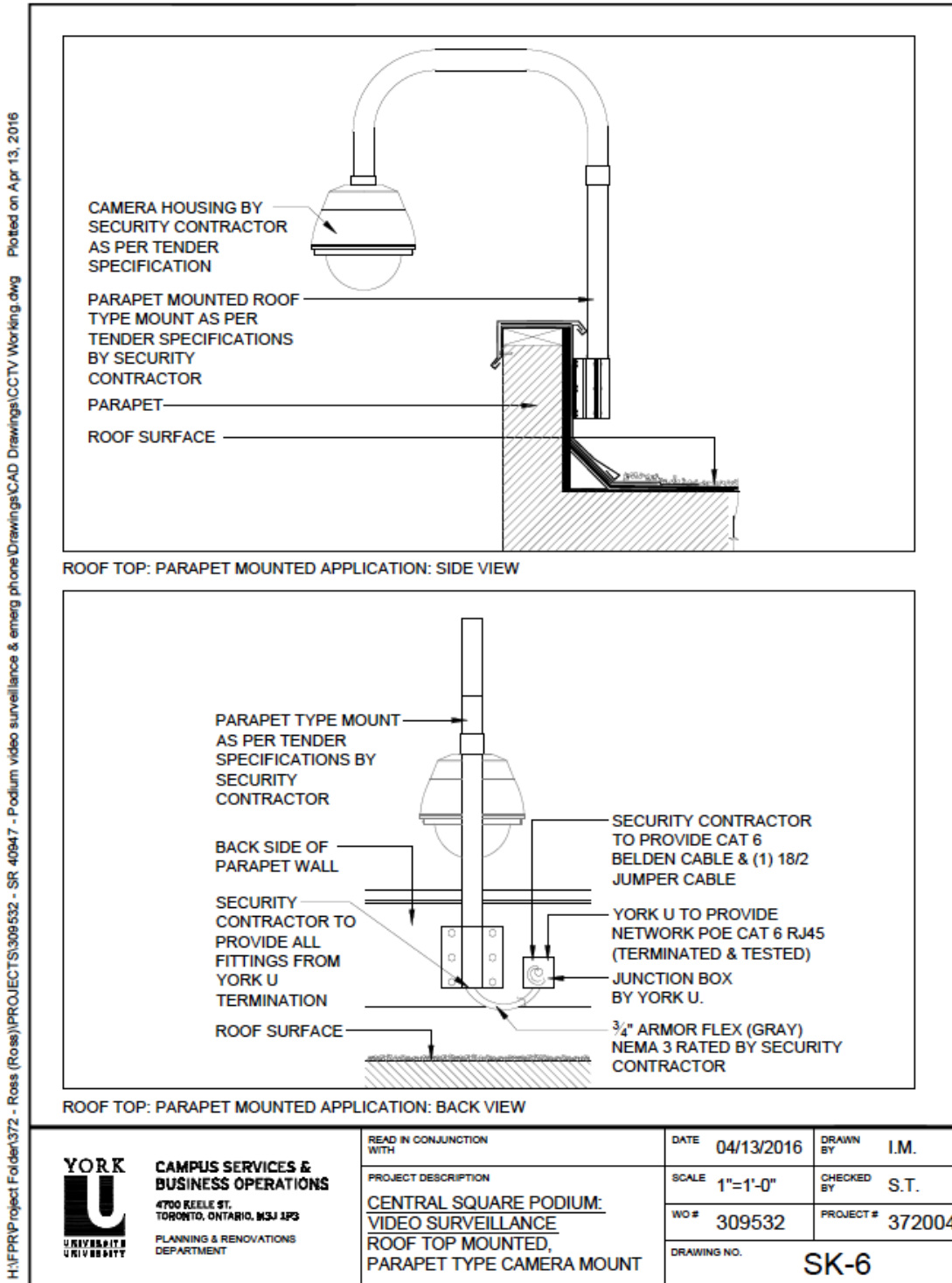


FIGURE SK6 CCTV CAMERA INSTALLATION ROOF TOP MOUNTED, PARAPE TYPE CAMERA MOUNT

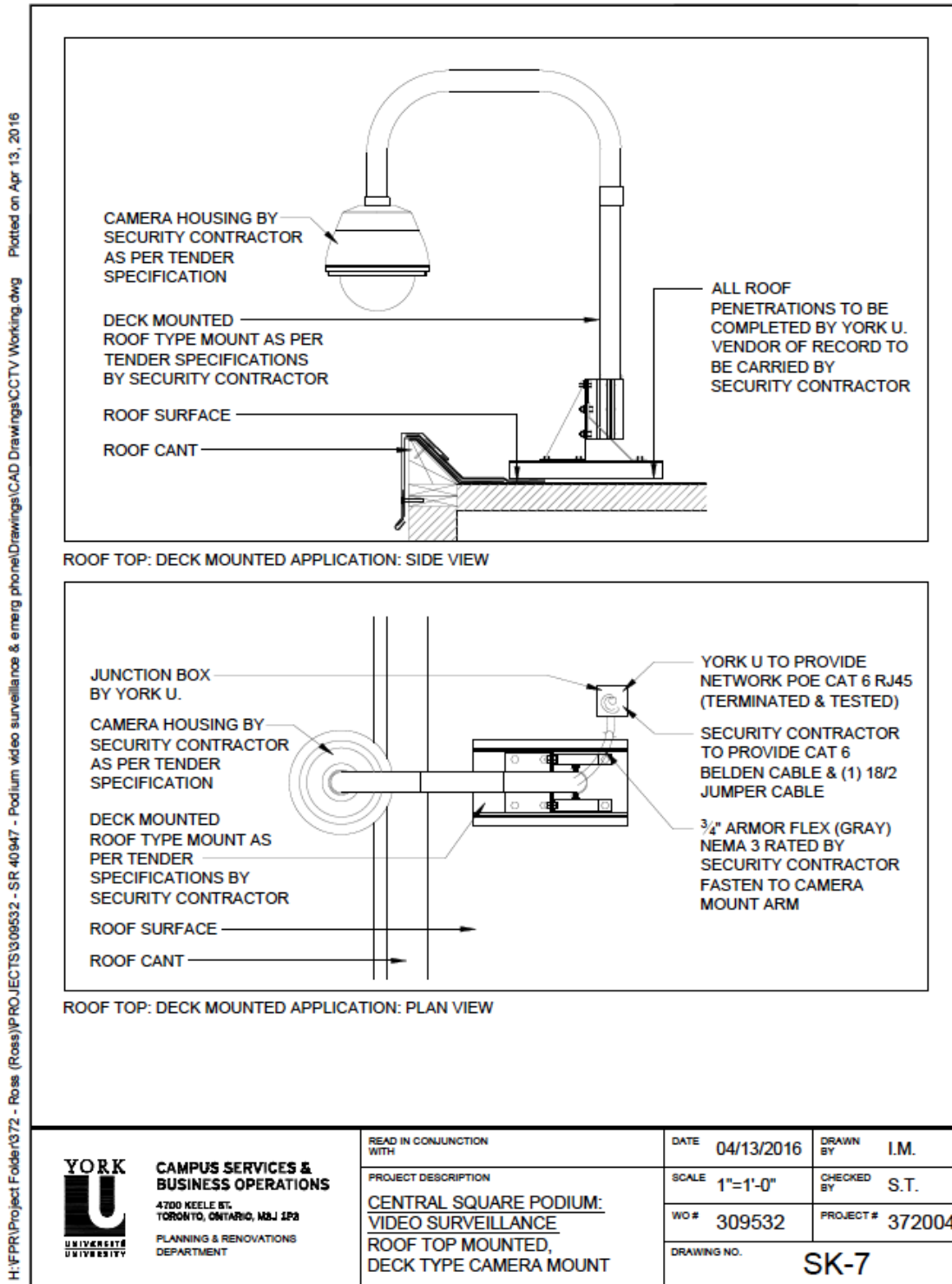


FIGURE SK 7 CCTV CAMERA INSTALLATION ROOF TOP MOUNTED, DECK TYPE CAMERA MOUNT

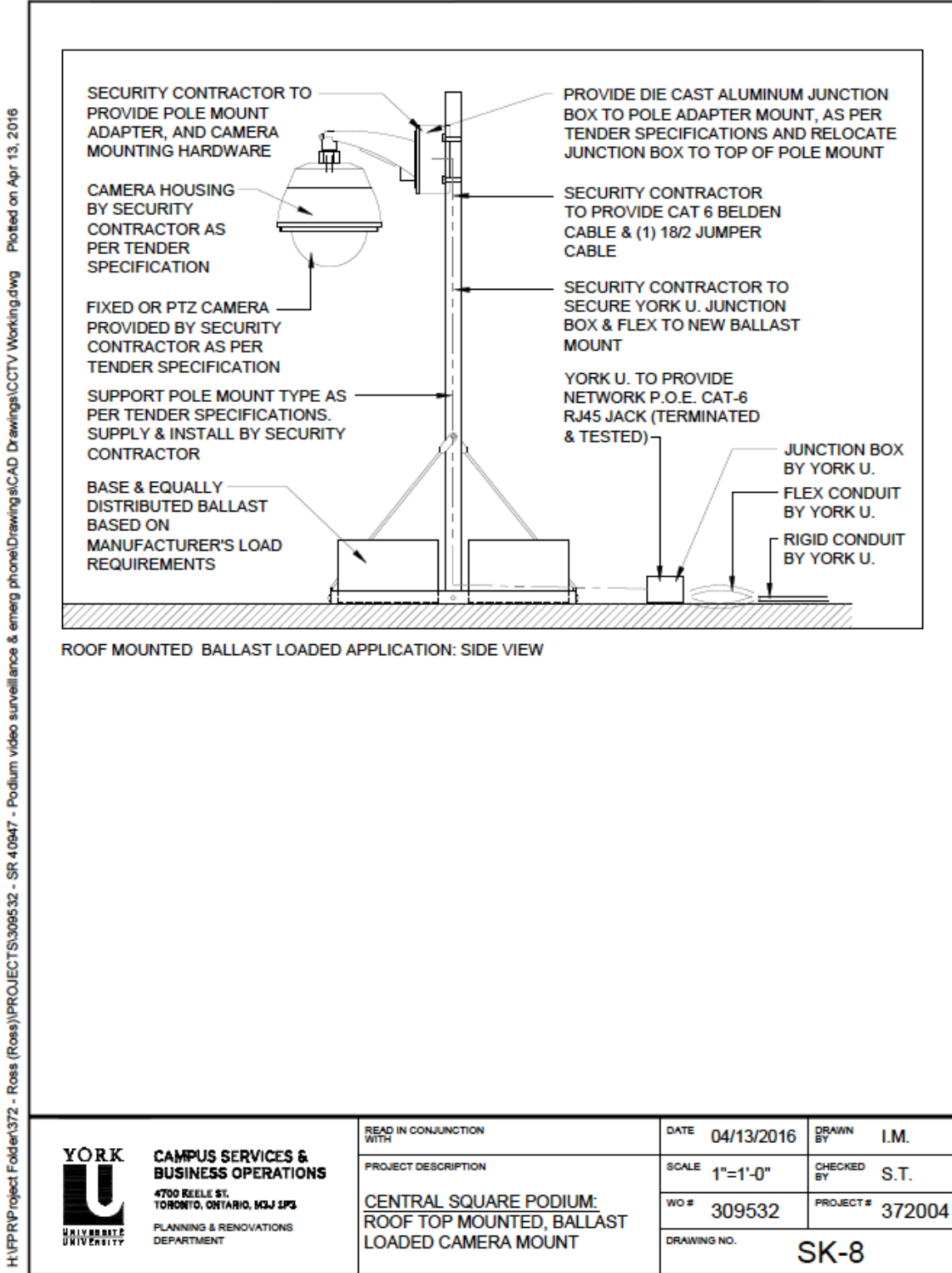


FIGURE SK 8 CCTV CAMERA INSTALLATION ROOF TOP MOUNTED, BALLAST LOADED CAMERA MOUNT