SECTION 682
TRAFFIC MANAGEMENT CCTV CAMERAS

PART 1 GENERAL

1.01 SUMMARY

A. Description

1. Furnish and install a high definition (HD) internet protocol (IP) closed-circuit television (CCTV) camera and cabinet at the location(s) shown in the Plans. Use new equipment and components that meets the minimum requirements of these specifications. Ensure that the installed equipment provides the Video Display Equipment at the Miami-Dade County TSS Division Traffic Management Center (TMC) with unobstructed video of the roadway, traffic, and other current conditions around a roadside CCTV field site; that it responds to camera control signals from the TMC operator; and that the video images can be transmitted to remote locations for observation.

B. Method of Measurement

1. The Contract unit price for each CCTV camera system furnished and installed, will include furnishing, placement, and testing of all equipment and materials, and for all tools, labor, operational software packages and firmware, supplies, support, personnel training, shop drawings, documentation, and incidentals necessary to complete the work.

C. Basis of Payment

1. Prices and payment will be full compensation for all work and materials required by this Section.
2. Payment will be made under:

Item No.	Description	Unit
682-1-133	ITS CCTV Camera, F&I, Dome PTZ Enclosure - Non-Pressurized, IP, High Definition	EA

1.02 REFERENCES

A. Miami-Dade County Traffic Signals and Signs Division's Qualified Product List (TSSQPL)

B. FDOT Approved Product List (APL)

C. National Electrical Manufacturers Association (NEMA) TS-2-2016

D. Telecommunications Industry Association (TIA)-568

1.03 SYSTEM DESCRIPTION

A. Design Requirements

1. Design to meet the requirements of all applicable standards. Ensure that the CCTV camera, cabinet, mounting hardware, and any other camera-related material that is exposed to the environment can withstand loading from 150 mph wind speeds and meet the requirements of the FDOT Structures Manual, Volume 3.

B. Performance Requirements

1. CCTV camera must provide titling and masking features, including, but not limited to, programmable camera title, programmable preset titles for each preset position, and programmable privacy zones. Ensure that programmable titles are a minimum of 18 characters per line.
2. CCTV camera must provide the following features and capabilities:
    a. Day (color)/night (monochrome) switchover and iris control, with user-selectable manual and automatic control capabilities.
    b. Ability to produce clear, detailed, and usable video images of the areas, objects, and other subjects visible from a roadside CCTV field site. Ensure that video produced by the camera is true, accurate, distortion free, and free from transfer smear, oversaturation, and any other image defect that negatively impacts image quality under all lighting and weather conditions in both color and monochrome modes.
    c. User-selectable automatic gain control (AGC) that is peak-average adjustable to 28 decibels (dB).
    d. A minimum signal-to-noise ratio of 50 dB.
    e. Automatic color balance that references the white areas of the scene through the lens.
    f. An automatic electronic shutter that is user selectable from 1/60 to 1/10,000 of a second.
    g. A digital signal processor that provides a minimum 10x digital zoom.
    h. Programmable azimuth and compass display with ability to display pan and tilt position with a 1 degree resolution.
3. CCTV camera must comply with FDOT Specification Section 682-1.2.9 (Additional Requirements for IP Cameras) for:
    a. Video Encoding
    b. Encoded Video Interoperability
    c. Encoded Video Specifications
    d. Network Interface
    e. Configuration Management

1.04 WARRANTY

A. Ensure that CCTV cameras have a manufacturer's warranty covering defects for a minimum of three years. Ensure that the warranty requires the manufacturer to furnish replacements for any part or equipment found to be defective during the warranty period at no cost to the County within 10 calendar days of notification.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Use a dome-type High Definition (HD) Internet Protocol (IP) CCTV camera assembly that meet the requirements of this Specification and are listed on the Miami-Dade County TSS Division Qualified Products List (TSSQPL) and the Florida Department of Transportation (FDOT) Approved Product List (APL). Ensure equipment is permanently marked with the manufacturer's name or trademark, part number, and serial number and:

1. Is compatible with the current version of the FDOT's SunGuide® software system, and any other camera operating software indicated in the Plans and contract documents.
2. Has a minimum 18x motorized optical zoom lens with automatic iris that is:
    a. Capable of automatic and manual focus and iris control.
    b. Have a lens depth of field provides a clear image of roadside areas under all lighting conditions; and
    c. Has a maximum aperture of at least f/1.6.
3. Has an integrated pan/tilt mechanism capable of providing 360 degree continuous pan with a minimum 90 degree tilt range (i.e., 0 degrees to minus 90 degrees); provide variable speed control; have a preset position return accuracy of plus or minus 0.36 degree, or less than 0.10% or better; support a minimum of 64 presets; support a minimum of one tour with a minimum of 32 presets; and support a minimum of eight programmable blackout zones.
4. Has a positioner with a minimum automatic pan speed of 240 degrees per second to a preset camera position; that the maximum manual pan speed is a minimum of 80 degrees per second; and that maximum manual tilt speed is a minimum of 40 degrees per second.
5. Supports the National Transportation Communications for ITS Protocol (NTCIP) 1205 v1.08. Ensure that the camera is capable of communication with other devices using Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA)-232 or TIA-422 at a rate of 9600 bps, transmission control protocol (TCP)/IP, or user datagram protocol (UDP)/IP. Ensure that the CCTV camera supports the communication links shown in the Plans. The camera must be capable of remote firmware upgrade via the communication interface.
6. Supports the Open Network Video Interface Forum (ONVIF) Core, Streaming, and Media Service specification.

B. Electrical Specifications:

1. Camera must operate on a nominal voltage of 120 volts alternating current (VAC). Supply an appropriate voltage converter for devices that require operating voltages of less than 120 VAC.
2. Meet the requirements of FDOT Specification Section 620 for Grounding and Lightning Protection.

C. Mechanical Specifications:

1. Provide camera housings and hardware that are light in color or as noted in the Plans.
2. Ensure that the camera housing has a sunshield to reduce the solar heating of the camera. Ensure that the total weight of dome type CCTV cameras (including the

housing, sunshield, and all internal components) is less than 17.0 pounds. Ensure that the lower dome of the camera housing is distortion free clear plastic.

3. Ensure that pressurized dome-type housings are capable of pressurization at 5 pounds per square inch (psi) using dry nitrogen, that they have a low-pressure alarm feature, and has a NEMA 4X/IP-67 rating.

4. If a non-pressurized dome-type housing enclosure is used, ensure that the unit is vented with a thermostat-controlled heater and blower. Ensure that the non-pressurized enclosure has a NEMA 4/IP-66 rating.

5. Ensure that the total weight of external positioner-type CCTV cameras (including housing, sunshield, all internal components, and external pan and tilt mechanism) is less than 35 pounds.

D. Environmental Specifications:

1. Ensure that the CCTV camera performs all required functions during and after being subjected to the environmental testing procedures described in NEMA TS2, Sections 2.2.7, 2.2.8, and 2.2.9.

E. CCTV Equipment Cabinet.

1. General. The cabinet shell must be a Caltrans Type 336 cabinet type (36”H x 24”W x 20 to 22”D) meeting the requirements of FDOT Specification subarticle 676-2.5 (Intelligent Transportation System Cabinets) with a typical equipment layout as shown in FDOT Design Standards Index 18104. In urban areas where the minimum required right-of-way clearances cannot be maintained with a standard cabinet, a Miami-Dade County TSSQPL approved pole mounted CCTV cabinet may be proposed by the Engineer of Record as an alternative to the standard cabinet. When proposed, the alternative cabinet type must be shown on the Plans along with all detailed cabinet specifications meeting the Miami-Dade County Alternative CCTV Cabinet requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Ensure that the CCTV camera is installed at the locations shown in the Plans. Install the CCTV camera in accordance with the Miami-Dade County standard details and as shown in the Plans.

B. Furnish and install the power supplies, local control equipment, and any other camera-related field electronic equipment and transient voltage surge suppressors within the approved lockable CCTV cabinet. Ensure that the cabinet protects these electrical and electronic devices from rain, dust, dirt, and other harmful elements of nature.

C. Furnish and install all power, video, and data cables necessary to provide connection points for camera video and pan/tilt/zoom (PTZ) control signals within the cabinet. Furnish and install any and all ancillary equipment required to provide a complete and fully operational CCTV camera. Verify that all wiring meets National Electric Code (NEC) requirements where applicable.

D. Ensure that data and video cables from the pole to the camera are routed inside the mounting hardware and protected from exposure to the outside environment.

E. Coat the exterior of the dome-type enclosure's lower half with a manufacturer-approved clear, rain repellant product prior to final acceptance.

3.02 FIELD QUALITY CONTROL

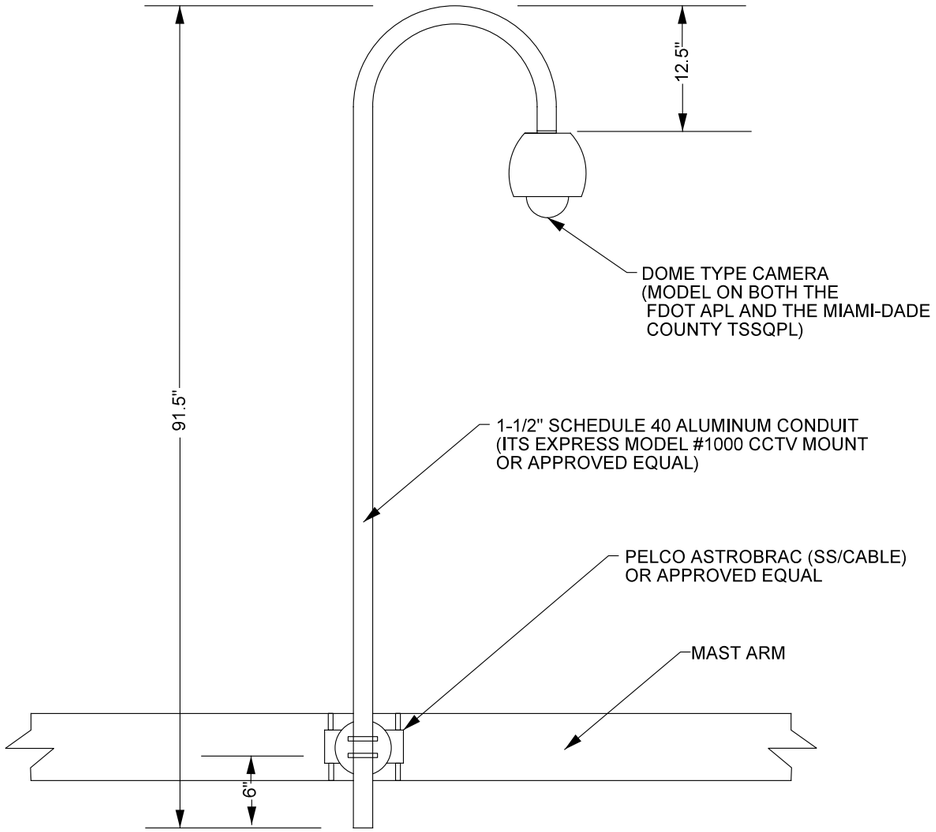
A. Subject the equipment covered by these specifications to a field acceptance test (FAT). Develop and submit a test plan to Engineer for review and approval. Ensure that the test plan demonstrates each and every functional requirement specified for the device or system under test. Engineer reserves the right to witness all tests:

B. Field Test Requirements: Perform local field operational tests at CCTV field sites according to the following:

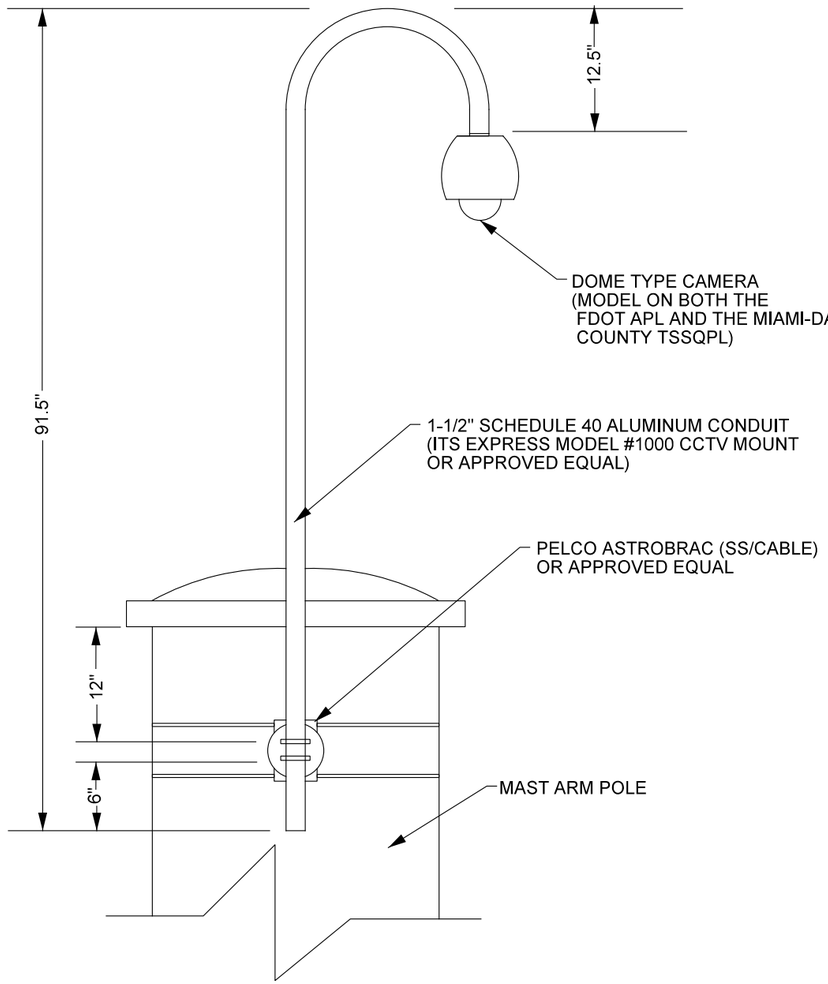
1. Verify that physical construction has been completed as specified in the Plans.
2. Verify the quality and tightness of ground and surge protector connections.
3. Verify proper voltages for all power supplies and related power circuits.
4. Verify all connections, including correct installation of communication and power cables.
5. Verify that the video signal from the camera is present and of consistent quality at all connection points between the camera, the cabinet, and any video devices therein.
6. Verify camera network configuration settings are correct and that encoded video from the camera can be viewed on the network via a local connection at the field site and from the TMC. Verify that field site and TMC video quality is consistent and does not exhibit source degradation such as distortion and artifacts.
7. Exercise PTZ and focus in all directions and execute a minimum of three other unique programming commands to ensure that the communication link between the cabinet and the camera is functioning properly.

END OF SECTION 682

TYPICAL MAST ARM CCTV MOUNTING DETAILS



MAST ARM MOUNT



MAST ARM POLE MOUNT

GENERAL NOTES:

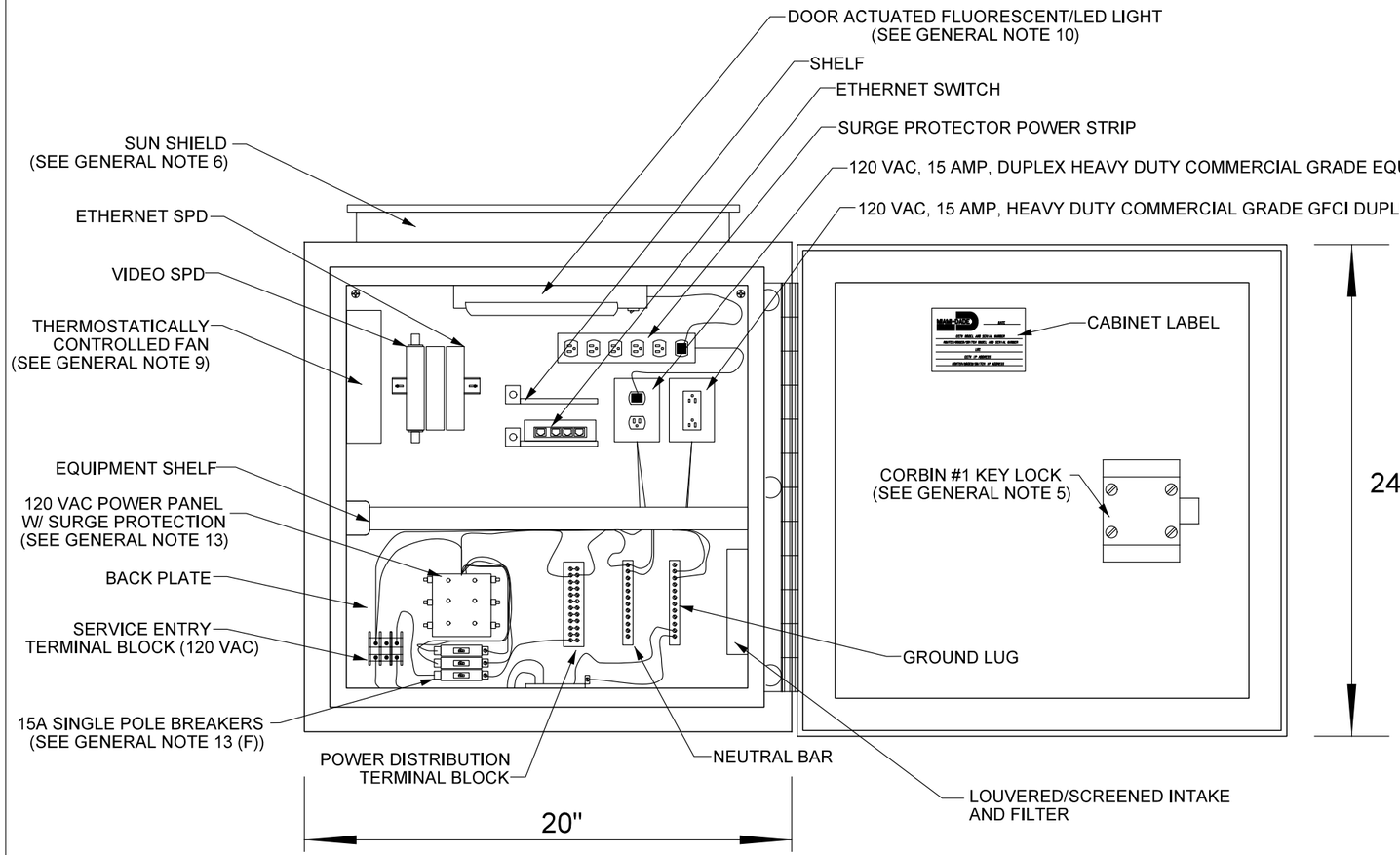
1. MEET THE REQUIREMENTS OF MIAMI-DADE COUNTY TRAFFIC CONTROL EQUIPMENT STANDARDS AND SPECIFICATIONS SECTION 682 (TRAFFIC MANAGEMENT CCTV CAMERAS).

2. SITE PLANS MUST IDENTIFY SPECIFIC PLACEMENT LOCATION ON MAST ARM. PROVIDE CERTIFICATION AND CALCULATIONS FROM ENGINEER OF RECORD THAT PROPOSED PLACEMENT WILL MEET APPLICABLE WIND LOADING REQUIREMENTS AND NOT EXCEED DESIGN LOADING LIMITS OR THE MAST ARM ASSEMBLY.

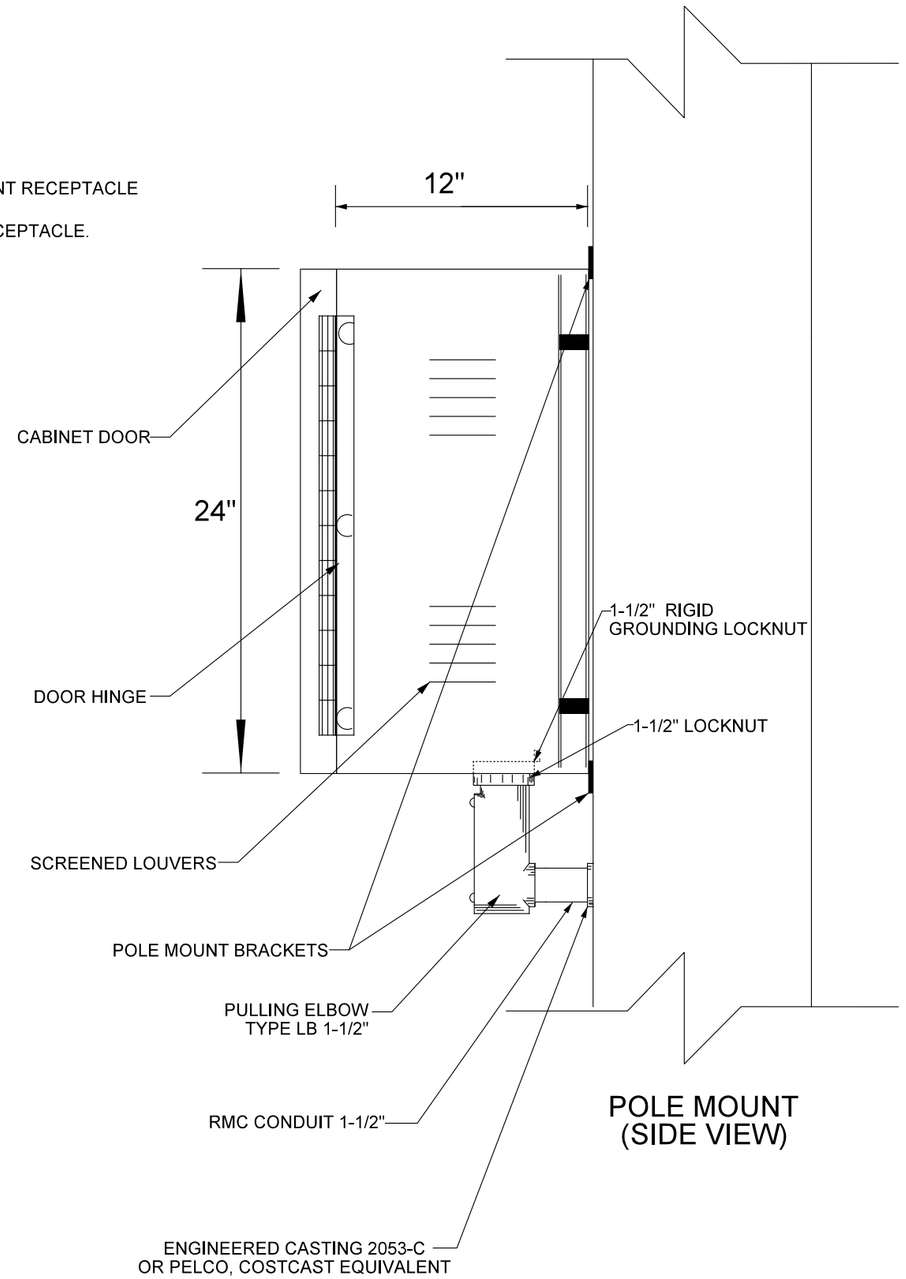
3. INCLUDE SITE-SPECIFIC DETAILS WITH PLANS THAT INCLUDE WIRING, CABLE ROUTING AND SUPPORTING SYSTEM EQUIPMENT.

LATEST REVISION	DESCRIPTION:	TRAFFIC CONTROL EQUIPMENT STANDARDS AND SPECIFICATIONS	MIAMI-DADE	DTPW TRAFFIC SIGNALS AND SIGNS DIVISION 7100 NW 36th STREET MIAMI, FLORIDA 33166 305.592.3580		NAME	DATE	TYPICAL MAST ARM CCTV MOUNTING DETAILS (N.T.S.)	SHEET NO.
03/31/17					DRAWN BY	TRAVIS BREWER	09-29-16		1 of 1
					CHECKED BY	NAHUM FERNANDEZ	03-22-17		
					APPROVED BY: FRANK AIRA, P.E.				

ALTERNATIVE CCTV CABINET AND EQUIPMENT LAYOUT DETAILS



CABINET
(FRONT VIEW)



POLE MOUNT
(SIDE VIEW)

NOTES:

1. CABINET LAYOUT IS FOR POLE MOUNTED INSTALLATIONS.
2. ALL DIMENSIONS AND SCALE ARE APPROXIMATE.
3. THE MINIMUM CCTV CABINET DIMENSIONS SHALL BE 24"H X 20"W X 12"D.
4. CABINET MUST HAVE A 1-1/2" KNOCKOUT HOLE AT THE BOTTOM FOR POWER CONDUIT.
5. CABINET LAYOUT REPRESENTS PREFERRED PLACEMENT OF TYPICAL DEVICES. PROJECT-SPECIFIC DESIGNS MAY NOT INCLUDE ALL COMPONENTS ILLUSTRATED HERE.
6. CABINET MINIMUM MOUNTING HEIGHT IS 7'
7. WIRING IS SHOWN FOR ILLUSTRATION ONLY. REFER TO MANUFACTURER'S WIRING DIAGRAM FOR DETAILS.

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04/19/17					DRAWN BY	TRAVIS BREWER	10-26-16		1of 2
					CHECKED BY	NAHUM FERNANDEZ	03-22-17		
					APPROVED BY: FRANK AIRA, P.E.				

GENERAL NOTES:

ALTERNATIVE CCTV CABINET MUST BE:

1. MEET THE REQUIREMENTS OF MIAMI-DADE COUNTY TRAFFIC CONTROL EQUIPMENT STANDARDS AND SPECIFICATIONS SECTION 682 (TRAFFIC MANAGEMENT CCTV CAMERAS).

2. UL LISTED, FDOT APL CERTIFIED, AND ON MIAMI-DADE COUNTY TSSQPL.

3. FDOT APL CERTIFIED COMPONENTS AND ENCLOSURE MEETING THE REQUIREMENTS OF FDOT SPECIFICATION SUBARTICLE 676-2.5 EXCEPT THE MINIMUM SIZE MAY BE 24"H X 20"W X 12"D WITH A SINGLE DOOR THAT IS HINGED ON RIGHT SIDE WHEN VIEW FROM FRONT.

4. STAINLESS STEEL CABINET HARDWARE, TYPE 304 AND TWO 19" EIA RACK ANGLES AND MINIMUM 10" DEEP RACK MOUNTED SHELF.

5. DOOR: CORBIN STYLE, #1, DEADBOLT LOCK, WITH TWO KEYS;CONTINUOS, 14 GAUGE STAINLESS STEEL HINGE WHICH CANNOT BE REMOVED WITHOUT OPENING DOOR.

6. SUN SHIELD THAT SHIELDS THE ENTIRE HOUSING, EXCEPT THE DOOR, FROM DIRECT SUNLIGHT, CONSTRUCTED SO THAT IT ALLOWS THE FREE PASSAGE OF AIR BETWEEN THE CABINET AND THE SHIELD, BUT DOES NOT FORM A "SAIL" PLACING AN EXCESSIVE LOAD ON THE CABINET MOUNTING STRUCTURE IN HIGH WINDS. TOP SLOPED TO REAR TO PREVENT STANDING WATER.

7. ONE SPARE DIN-RAIL.

8. INSULATION PARTS AND WIRE INSULATION CAPABLE OF WITHSTANDING A MINIMUM OF 600 VOLTS.

9. FILTERED VENT OPENINGS WITH 4", 100 CFM, BALL BEARING, 120 VAC FAN WITH FAN THERMOSTAT, 1A FUSE AND FUSE HOLDER, AND R/C NOISE SUPPRESSOR.

10. DOOR ACTUATED FLUORESCENT (OR EQUIVALENT LED) LIGHTING FIXTURE INCLUDES A COOL WHITE LAMP, COVERED AND OPERATED BY A NORMAL POWER FACTOR, UL LISTED BALLAST.

11. DOOR SWITCH FOR ALARM LOCATED IN THE BOTTOM POSITION OF THE DOOR SWITCH BRACKET.

12. EQUIP THE CABINET WITH CIRCUIT BREAKERS, RADIO INTERFERENCE FILTERS, GROUND LOOP ISOLATORS, LIGHTING ARRESTERS AND SURGE PROTECTOR MEETING THE REQUIREMENTS OF FDOT SPECIFICATION SECTION 620.

13. POWER PANEL, FRONT RACK MOUNTED, EQUIPPED WITH AND WIRED FOR:

    A) 15A, 120VAC, 3W, SINGLE PHASE POWER.
    B) SERVICE ENTRANCE TERMINAL BLOCKS; FINGER-SAFE, SCREW TYPE.
    C) POWER DISTRIBUTION TERMINAL BLOCKS; FINGER-SAFE, SCREW TYPE.
    D) GROUNDING LUG.
    E) (1) MAIN POWER SURGE ARRESTOR, 120 / 240 VAC, 50 KA.
    F) (1) 15 AMP, SINGLE POLE, MAIN CIRCUIT BREAKER.
    G) (2) 15 AMP, SINGLE POLE, CIRCUIT BREAKERS. PROTECT THE FLUORESCENT LIGHT, GFCI-PROTECTED DUPLEX RECEPTACLE, AND FAN WITH ONE BREAKER. PROTECT THE CCTV EQUIPMENT WITH OTHER BREAKER.
    H) RECEPTACLES:
        1) 120 VAC, 15 AMP, DUPLEX HEAVY DUTY COMMERCIAL GRADE EQUIPMENT RECEPTACLE.
        2) 120 VAC, 15 AMP, HEAVY DUTY COMMERCIAL GRADE GFCI DUPLEX RECEPTACLE.

14. CABINET AND MOUNTING HARDWARE MUST MEET THE LOAD REQUIREMENTS OF SECTION 3 AASHTO LTS-6 AS MODIFIED BY FDOT STRUCTURES MANUAL VOLUME 3 USING A BASIC WIND SPEED (V) OF 150 MPH.

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04/19/17					DRAWN BY	TRAVIS BREWER	10-26-16		2 of 2
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