

TRAFFIC SIGNAL PAY QUANTITY NOTES (CONT.)
(OF 5 CONT.)

1.1 SYSTEM HARDWARE

THE MACHINE VISION SYSTEM HARDWARE SHALL CONSIST OF THREE COMPONENTS:
1) A COLOR, 22X ZOOM, MVP SENSOR
2) A MODULAR CABINET INTERFACE UNIT
3) A COMMUNICATION INTERFACE PANEL.

ADDITIONALLY, A PERSONAL COMPUTER (PC) SHALL HOST THE SERVER AND CLIENT APPLICATIONS THAT ARE USED TO PROGRAM AND MONITOR THE SYSTEM COMPONENTS. THE CONTRACTOR SHALL NOT BE REQUIRED TO SUPPLY A PC TO THE CITY UNLESS SPECIFICALLY MENTIONED BY SPECIAL PROVISIONS AND/OR CONTRACT BID ITEM. THE REAL-TIME PERFORMANCE SHALL BE OBSERVED BY VIEWING THE VIDEO OUTPUT FROM THE SENSOR WITH OVERLAID FLASHING DETECTORS TO INDICATE THE CURRENT DETECTION STATE (ON/OFF). THE MVP SENSOR SHALL OPTIONALLY STORE CUMULATIVE TRAFFIC STATISTICS INTERNALLY IN NON-VOLATILE MEMORY FOR LATER RETRIEVAL AND ANALYSIS.

THE MVP SHALL COMMUNICATE TO THE MODULAR CABINET INTERFACE UNIT VIA THE COMMUNICATIONS INTERFACE PANEL AND THE SOFTWARE APPLICATIONS USING THE INDUSTRY STANDARD TCP/IP NETWORK PROTOCOL. THE MVP SHALL HAVE A BUILT-IN, ETHERNET-READY, INTERNET PROTOCOL (IP) ADDRESS AND SHALL BE ADDRESSABLE WITH NO PLUG IN DEVICES OR CONVERTERS REQUIRED. THE MVP SHALL PROVIDE STANDARD MPEG-4 STREAMING DIGITAL VIDEO. ACHIEVABLE FRAME RATES SHALL VARY FROM 5 TO 30 FRAMES/SEC AS A FUNCTION OF VIDEO QUALITY AND AVAILABLE BANDWIDTH.

THE MODULAR CABINET INTERFACE UNIT SHALL COMMUNICATE DIRECTLY WITH UP TO EIGHT (8) MVP SENSORS AND SHALL COMPLY WITH THE FORM FACTOR AND ELECTRICAL CHARACTERISTICS TO PLUG DIRECTLY INTO A NEMA TYPE C OR D DETECTOR RACK PROVIDING UP TO THIRTY-TWO (32) INPUTS AND SIXTY-FOUR (64) OUTPUTS OR A 170 INPUT FILE RACK PROVIDING UP TO SIXTEEN (16) CONTACT CLOSURE INPUTS AND TWENTY-FOUR (24) CONTACT CLOSURE OUTPUTS TO A TRAFFIC SIGNAL CONTROLLER. THE COMMUNICATION INTERFACE PANEL SHALL PROVIDE FOUR (4) SETS OF THREE (3) ELECTRICAL TERMINATIONS FOR THREE-WIRE POWER CABLES FOR UP TO EIGHT (8) MVP SENSORS THAT MAY BE MOUNTED ON A POLE OR MAST ARM WITH A TRAFFIC SIGNAL CABINET OR JUNCTION BOX. THE COMMUNICATION INTERFACE PANEL SHALL PROVIDE HIGH-ENERGY TRANSIENT PROTECTION TO ELECTRICALLY PROTECT THE MODULAR CABINET INTERFACE UNIT AND CONNECTED MVP SENSORS. THE COMMUNICATIONS INTERFACE PANEL SHALL PROVIDE SINGLE-POINT ETHERNET CONNECTIVITY VIA RJ45 CONNECTOR FOR COMMUNICATION TO AND BETWEEN THE MODULAR CABINET INTERFACE MODULE AND THE MVP SENSORS.

1.2 SYSTEM SOFTWARE

THE MVP SENSOR EMBEDDED SOFTWARE SHALL INCORPORATE MULTIPLE APPLICATIONS THAT PERFORM A VARIETY OF DIAGNOSTIC, INSTALLATION, FAULT TOLERANT OPERATIONS, DATA COMMUNICATIONS, DIGITAL VIDEO STREAMING, AND VEHICLE DETECTION PROCESSING. THE DETECTION SHALL BE RELIABLE, CONSISTENT, AND PERFORM UNDER ALL WEATHER, LIGHTING, AND TRAFFIC CONGESTION LEVELS. AN EMBEDDED WEB SERVER SHALL PERMIT STANDARD INTERNET BROWSERS TO CONNECT AND PERFORM BASIC CONFIGURATION, MAINTENANCE, AND VIDEO STREAMING SERVICES.

THERE SHALL BE A SUITE OF CLIENT APPLICATIONS THAT RESIDE ON THE HOST CLIENT/SERVER PC. THE APPLICATIONS SHALL EXECUTE UNDER MICROSOFT WINDOWS XP OR VISTA. AVAILABLE CLIENT APPLICATIONS SHALL INCLUDE:

MASTER NETWORK BROWSER: LEARN A NETWORK OF CONNECTED MODULAR CABINET INTERFACE UNITS AND MVP SENSORS, DISPLAY BASIC INFORMATION, AND LAUNCH APPLICATIONS SOFTWARE TO PERFORM OPERATIONS WITHIN THAT SYSTEM OF SENSORS.

CONFIGURATION SETUP: CREATE AND MODIFY DETECTOR CONFIGURATIONS TO BE EXECUTED ON THE MVP SENSOR AND THE MODULAR CABINET INTERFACE UNIT.

OPERATION LOG: RETRIEVE, DISPLAY, AND SAVE FIELD HARDWARE RUN-TIME OPERATION LOGS OF SPECIAL EVENTS THAT HAVE OCCURRED.

SOFTWARE INSTALL: RECONFIGURE ONE OR MORE MVP SENSORS WITH NEWER RELEASE OF EMBEDDED SYSTEM SOFTWARE.

STREAMING VIDEO PLAYER: PLAY AND RECORD STREAMING VIDEO WITH FLASHING DETECTOR OVERLAY.

DATA RETRIEVAL: FETCH ONCE OR POLL FOR TRAFFIC DATA AND ALARMS AND STORE ON PC STORAGE MEDIA.

COMMUNICATIONS SERVER: PROVIDE FAULT-TOLERANT, REAL-TIME TCP/IP COMMUNICATIONS TO/FROM ALL DEVICES AND CLIENT APPLICATIONS WITH FULL LOGGING CAPABILITY FOR SYSTEMS INTEGRATION.

2. FUNCTIONAL CAPABILITIES

2.1 MVP SENSOR

THE MVP SENSOR SHALL BE AN INTEGRATED IMAGING COLOR CCD ARRAY WITH ZOOM LENS OPTICS, HIGH-SPEED, DUAL-CORE IMAGE PROCESSING HARDWARE BUNDLED INTO A SEALED ENCLOSURE. THE CCD ARRAY SHALL BE DIRECTLY CONTROLLED BY THE DUAL-CORE PROCESSOR, THUS PROVIDING HIGH-QUALITY VIDEO FOR DETECTION THAT HAS VIRTUALLY NO NOISE TO DEGRADE DETECTION PERFORMANCE. IT SHALL BE POSSIBLE TO ZOOM THE LENS AS REQUIRED FOR SETUP AND OPERATION. IT SHALL PROVIDE JPEG VIDEO COMPRESSION AS WELL AS STANDARD MPEG-4 DIGITAL STREAMING VIDEO WITH FLASHING DETECTOR OVERLAY. THE MVP SHALL PROVIDE DIRECT REAL-TIME IRIS AND SHUTTER SPEED CONTROL. THE MVP IMAGE SENSOR SHALL BE EQUIPPED WITH AN INTEGRATED 22X ZOOM LENS THAT CAN BE CHANGED USING EITHER CONFIGURATION COMPUTER SOFTWARE. THE DIGITAL STREAMING VIDEO OUTPUT AND ALL DATA COMMUNICATIONS SHALL BE TRANSMITTED OVER THE THREE-WIRE POWER CABLE.

2.2 POWER

THE MVP SENSOR SHALL OPERATE ON 110/220 VAC, 50/60 HZ AT A MAXIMUM OF 25 WATTS. THE CAMERA AND PROCESSOR ELECTRONICS SHALL CONSUME A MAXIMUM OF 10 WATTS AND THE REMAINING 15 WATTS SHALL SUPPORT AN ENCLOSURE HEATER.

2.3 DETECTION ZONE PROGRAMMING

PLACEMENT OF DETECTION ZONES SHALL BE BY MEANS OF A PERSONAL COMPUTER (PC) WITH A WINDOWS XP OR VISTA OPERATING SYSTEM, A KEYBOARD, AND A MOUSE. THE PC MONITOR SHALL BE ABLE TO SHOW THE DETECTION ZONES SUPERIMPOSED ON IMAGES OF TRAFFIC SCENES.

THE DETECTION ZONES SHALL BE CREATED BY USING A MOUSE TO DRAW DETECTION ZONES ON THE PC MONITOR. USING THE MOUSE AND KEYBOARD IT SHALL BE POSSIBLE TO PLACE, SIZE, AND ORIENT DETECTION ZONES TO PROVIDE OPTIMAL ROAD COVERAGE FOR VEHICLE DETECTION. IT SHALL BE POSSIBLE TO DOWNLOAD DETECTOR CONFIGURATIONS FROM THE PC TO THE MVP SENSOR AND CABINET INTERFACE MODULE. TO RETRIEVE THE DETECTOR CONFIGURATION THAT IS CURRENTLY RUNNING IN THE MVP SENSOR, AND TO BACK UP DETECTOR CONFIGURATIONS BY SAVING THEM TO THE PC FIXED DISKS OR OTHER REMOVABLE STORAGE MEDIA.

THE SUPERVISOR COMPUTER'S MOUSE AND KEYBOARD SHALL BE USED TO EDIT PREVIOUSLY DEFINED DETECTOR CONFIGURATIONS TO PERMIT ADJUSTMENT OF THE DETECTION ZONE SIZE AND PLACEMENT, TO ADD DETECTORS FOR ADDITIONAL TRAFFIC APPLICATIONS, OR TO REPROGRAM THE MVP SENSOR FOR DIFFERENT TRAFFIC APPLICATIONS OR CHANGES IN INSTALLATION SITE GEOMETRY OR TRAFFIC REROUTING.

2.4 MODULAR CABINET INTERFACE UNIT

THE MODULAR CABINET INTERFACE UNIT SHALL PROVIDE THE HARDWARE AND SOFTWARE MEANS FOR UP TO EIGHT (8) MVP SENSORS TO COMMUNICATE REAL-TIME DETECTION STATES AND ALARMS TO A LOCAL TRAFFIC SIGNAL CONTROLLER. IT SHALL COMPLY WITH THE ELECTRICAL AND PROTOCOL SPECIFICATIONS OF THE DETECTOR RACK STANDARDS. THE CARD SHALL HAVE 1500 VRMS ISOLATION BETWEEN RACK LOGIC GROUND AND STREET WIRING.

THE MODULAR CABINET INTERFACE UNIT SHALL BE A SIMPLE INTERFACE CARD THAT PLUGS DIRECTLY INTO A 170 INPUT FILE RACK OR A NEMA TYPE C OR D DETECTOR RACK. THE MODULAR CABINET INTERFACE UNIT SHALL OCCUPY ONLY 2 SLOTS OF THE DETECTOR RACK. THE MODULAR CABINET INTERFACE UNIT SHALL ACCEPT UP TO SIXTEEN (16) PHASE INPUTS AND SHALL PROVIDE UP TO TWENTY-FOUR (24) DETECTOR OUTPUTS.

2.5 COMMUNICATIONS INTERFACE PANEL

THE COMMUNICATIONS INTERFACE PANEL SHALL SUPPORT UP TO EIGHT MVP'S. THE COMMUNICATIONS INTERFACE PANEL SHALL ACCEPT 110/220 VAC, 50/60 HZ POWER AND PROVIDE PREDEFINED WIRE TERMINATION BLOCKS FOR MVP POWER CONNECTIONS, A BROADBAND-OVER-POWER-LINE (BPL) TRANSCEIVER TO SUPPORT UP TO 10MB/S INTERDEVICE COMMUNICATIONS, ELECTRICAL SURGE PROTECTORS TO ISOLATE THE MODULAR CABINET INTERFACE UNIT AND MVP SENSORS, AND AN INTERFACE CONNECTOR TO CABLE DIRECTLY TO THE MODULAR CABINET INTERFACE UNIT.

THE INTERFACE PANEL SHALL PROVIDE POWER FOR UP TO EIGHT (8) MVP SENSORS, TAKING LOCAL LINE VOLTAGE 110/220 VAC, 50/60 HZ AND PRODUCING 110/220 VAC, 50/60 HZ, AT ABOUT 30 WATTS TO EACH MVP SENSOR. TWO 1/2-AMP SLO-BLO FUSES SHALL PROTECT THE COMMUNICATIONS INTERFACE PANEL.

3. SYSTEM INSTALLATION

THE SUPPLIER OF THE VIDEO DETECTION SYSTEM SHALL SUPERVISE THE INSTALLATION AND TESTING OF THE VIDEO DETECTION SYSTEM AS REQUIRED BY THE CITY OF NORMAN.

4. WARRANTY SERVICE AND SUPPORT

FOR A MINIMUM OF TWO (2) YEARS, THE SUPPLIER SHALL WARRANT THE VIDEO DETECTION SYSTEM. ONGOING SOFTWARE SUPPORT BY THE SUPPLIER SHALL INCLUDE SOFTWARE UPDATES OF THE MVP SENSOR, MODULAR CABINET INTERFACE UNIT, AND SUPERVISOR COMPUTER APPLICATIONS. THESE UPDATES SHALL BE PROVIDED FREE OF CHARGE DURING THE WARRANTY PERIOD. THE SUPPLIER SHALL MAINTAIN A PROGRAM FOR TECHNICAL SUPPORT AND SOFTWARE UPDATES FOLLOWING EXPIRATION OF THE WARRANTY PERIOD. THIS PROGRAM SHALL BE AVAILABLE TO THE CONTRACTING AGENCY IN THE FORM OF A SEPARATE AGREEMENT FOR CONTINUING SUPPORT.

(SP-9) POLYMER CONCRETE PULL BOXES SHALL BE USED. PRICE BID FOR PULL BOX INCLUDES ANY CONCRETE TO BE INSTALLED OR REMOVED AS WELL AS ANY SWEEPING 90° CONDUIT ELBOWS.

(SP-10) TO BE USED FOR TREE TRIMMING AS DIRECTED BY ENGINEER.

(SP-11) GENERAL DESCRIPTION
THE EQUIPMENT FURNISHED UNDER THIS SPECIFICATION SHALL BE THE LATEST PRODUCTION MODELS CONFORMING TO THE LATEST STANDARD SPECIFICATIONS OF THE OKLAHOMA DEPARTMENT OF TRANSPORTATION AND THE CITY OF NORMAN.

THE EQUIPMENT TO BE SPECIFIED IS A TESCO CLASS 22-46 BATTERY BACKUP UNIT, OR AN APPROVED EQUAL. THE BELOW LISTED SPECIFICATIONS ARE THE DESIRED MINIMUM. BIDDER'S EQUIPMENT SHOULD EQUAL OR EXCEED THESE SPECIFICATIONS. DEVIATIONS MAY BE ACCEPTED ONLY AS APPROVED BY CITY TRAFFIC ENGINEER.

1. GENERAL

THE EQUIPMENT SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA). ANY EQUIPMENT MANUFACTURER SHALL SUPPLY CERTIFICATION SHOWING THAT THE PARTICULAR MODEL OF EQUIPMENT INTENDED TO BE FURNISHED, HAS BEEN TESTED AND APPROVED BY A QUALIFIED INDEPENDENT TESTING LABORATORY PER REQUIREMENTS SPECIFIED IN THE NEMA STANDARD. A "QUALIFIED" INDEPENDENT TESTING LABORATORY IS DEFINED AS A LABORATORY WHICH CLEARLY SHOWS THAT IT IS CAPABLE OF PERFORMING THE TEST IN ACCORDANCE WITH THE NEMA. THE MANUFACTURER SHALL SUPPLY QUALIFICATION STATEMENTS AND/OR OTHER DOCUMENTATION THAT INDICATES THE LABORATORY IS PROFESSIONALLY RECOGNIZED, REPUTABLE IN NATURE, AND EQUIPPED WITH OR HAS ACCESS TO ALL NECESSARY TESTING APPARATUS TO SUPPLY A CERTIFIED LETTER WITH DELIVERY OF THE EQUIPMENT (IDENTIFIED BY LOCATION AND SERIAL NUMBER) INDICATING THAT THE PARTICULAR EQUIPMENT FURNISHED IS IDENTICAL TO THE EQUIPMENT THAT WAS TESTED AND APPROVED AND THAT ALL "COMPONENTS AND PARTS" USED IN ASSEMBLING THE EQUIPMENT ARE EQUAL OR SUPERIOR IN QUALITY TO THE ONES USED IN THE TESTING OF THE EQUIPMENT.

1.1 THE BATTERY BACKUP SYSTEM SHALL HAVE MANUFACTURER'S CERTIFICATES (IF NEEDED), WARRANTY OF SERVICE, INSTRUCTION BOOKS, SERVICE MANUALS, A LIST OF GENERIC PART NUMBERS FOR SERVICE PERSONNEL, AND COMPLETE INSTALLATION INSTRUCTIONS.

1.2 THIS SPECIFICATION APPLICABLE TO A SPECIFIC INTERSECTION COVERS ONE COMPLETE UNIT OF UNINTERRUPTIBLE POWER SUPPLY TO BE ATTACHED TO TRAFFIC SIGNAL CABINETS TO OPERATE THE SIGNAL DURING POWER FAILURES. EACH UNIT SHALL CONSIST OF ONE CONTROL ASSEMBLY, ONE POWER TRANSFER SWITCH, 24V STRING OF 18AH BATTERIES, ONE BATTERY CABINET WITH GENERATOR KIT INCLUDING BYPASS SWITCH AND RECEPTACLE COVER.

2. GENERAL EQUIPMENT

2.1 THE SYSTEM SHALL PROVIDE A 120 VAC 60 HZ PURE SINE WAVE. THE SYSTEM SHALL PROVIDE POWER FOR NORMAL SIGNAL OPERATION, FLASH OPERATION, AND NORMAL/FLASH COMBINATION MODE.

2.2 THE SYSTEM SHALL BE DESIGNED FOR OUTDOOR APPLICATIONS AND MEET THE ENVIRONMENTAL REQUIREMENTS AS IS STANDARD IN THE TRAFFIC INDUSTRY. IT SHALL CONFORM TO NEMA, NATIONAL ELECTRIC CODE (NEC), AND UNDERWRITERS LABORATORY (UL) STANDARDS.

2.3 THE UNINTERRUPTED POWER SUPPLY (UPS) SYSTEM SHALL INCLUDE ALL NECESSARY CABLES, WIRING HARNESSSES, BATTERY CABLES, AND ALL COMPONENTS FOR PROPER OPERATION.

3. UPS PANEL MINIMUM

3.1 GENERATOR TRANSFER SWITCH WITH UPS BYPASS AND 30 AMP EXTERNAL REVERSE SERVICE PLUG.

3.2 UPS BYPASS AND UPS ISOLATION SWITCH.

3.3 DEADFRONT SAFETY PANEL BOARD WITH ALL SWITCHES, INDICATING FUSES, PLUGS, AND ISOLATION FUSES FOR EACH BATTERY PRE-WIRED WITH PHENOLIC NAMEPLATES.

3.4 ALL NAMEPLATES SHALL BE SCREWED ON PHENOLIC ENGRAVED TYPE.

3.5 ALL WIRE TERMINATING LUGS SHALL BE FULL WRAP AROUND TYPE.

3.6 ALL BATTERIES SHALL BE CAPTIVE SPACED FROM EXTERNAL CABINET SIDES IN EARTHQUAKE PROOF BUCKETS.

3.7 CABINET VENTILATION SHALL BE BY TWO (2) 4" X 1/4" LOUVERS TOP AND BOTTOM WITH ENCAPSULATED BUG SCREENS, CLEANABLE FILTERS, AND A 100CFM FAN TO COMPLETELY EXCHANGE AIR A MINIMUM OF 25 TIMES PER MINUTE.

3.8 ALL DC TERMINALS AND CONNECTIONS SHALL INCORPORATE SAFETY COVERS SUCH THAT THE SAFETY COVERS ARE IN PLACE FOR EVERY NORMAL MAINTENANCE MODE.

3.9 EVENT COUNTERS AND TOTAL RUN TIME COUNTERS.

DESIGN	CEM	02/16	BOYD ST. AND UNIVERSITY BLVD.
DRAWN	CEM	02/16	
CHECKED	NDT	02/16	
APPROVED			
SQUAD	GARVER		

NOTES

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