IX. CONTROLLER CABINETS

A. GENERAL:

1. CONTROLLER CABINETS:

a. EQUIPMENT: THE CONTROLLER CABINET SHALL BE OF THE MODEL SPECIFIED IN THE MAJOR ITEMS OF THE ELECTRONIC EQUIPMENT LIST SHOWN ON THE TRAFFIC SIGNAL QUANTITIES SHEET. THE CABINET SHALL, AT A MINIMUM, COME EQUIPPED WITH THE ELECTRONIC EQUIPMENT AS SHOWN IN THE SAME LIST. ALL ELECTRONIC EQUIPMENT SHALL MEET THE REQUIREMENTS OF THE TSCES AS MODIFIED BELOW.

b. COLOR: THE CONTROLLER CABINET SHALL BE NATURAL ALUMINUM.

X. 333SD - ITS TYPE 3 TRAFFIC SIGNAL CABINET

A. GENERAL:

1. CONTROLLER CABINETS: THE CONTROLLER CABINET SHALL BE A MODEL 333SD–ITS TYPE 3. THE 333SD–ITS TYPE 3 CABINET SHALL INCLUDE A BASE EXTENSION ASSEMBLY. EACH CABINET SHALL BE NATURAL ALUMINUM WITH ANCHOR BOLTS IN ACCORDANCE WITH THE FHWA–IP–78–16 SPECIFICATION. THE INPUT FILES SHALL MEET THE REQUIREMENTS OF THE SPLIT INPUT FILE DETAILS.

QUANTITY:

2 EA. – INTERNAL (FRONT/BACK) FLUORESCENT LAMPS
1 EA. – NEW YORK 330 PULL–OUT DRAWER ASSEMBLY
2 EA. – FAN PANEL ASSEMBLIES
1 EA. – TRANSIENT VOLTAGE SURGE SUPPRESSION SYSTEM (SHA–1210)
2 EA. – SPLIT INPUT FILES w/ LEAD EDGED PLASTIC CARD GUIDES
1 EA. – OUTPUT FILE w/ LEAD EDGED PLASTIC CARD GUIDES
(NO PHOENIX CONNECTORS)
1 EA. – RED MONITOR KIT ASSEMBLY
1 EA. – TRAFFIC UPS (SEE SPECIFICATIONS)
2 EA. – CABINET LIFTING PLATES (MOUNTED ON THE SIDES OF THE CABINET)

CABINET DIMENSIONS: 54"X44½"X26"

CABINET SHALL HAVE FOUR (4) DOORS AND CORBIN #2 LOCKS & KEYS

THE LEFT SIDE OF THE 333SD–ITS CABINET ASSEMBLY SHALL HAVE SHELVES ASSEMBLED TO THE EIA RACK ASSEMBLY TO HOUSE ADDITIONAL EQUIPMENT SUCH AS, BUT NOT LIMITED TO; VIDEO DETECTION, STANDBY UNINTERRUPTED POWER SUPPLY AND COMMUNICATION EQUIPMENT.

ALL CABINETS SHALL HAVE A PROTECTIVE SHIELD OVER THE CIRCUIT BREAKERS TO PREVENT THEM FROM BEING ACCIDENTALLY TURNED OFF. THE SHIELD SHALL BE MOUNTED IN SUCH A WAY THAT THE SWITCHES ARE STILL READILY VISIBLE TO THE TECHNICIAN AND CAN BE TURNED ON OR OFF.

B. OUTPUT FILE:

1. THE OUTPUT FILE SHALL HAVE EIGHT "FLASH PROGRAMMING JUMPER BLOCKS," ONE FOR EACH OF THE EIGHT PHASES AND SHALL CONTAIN UPPER & LOWER LEAD EDGED PLASTIC CARD GUIDES.

C. INPUT FILE:

1. THE INPUT FILES SHALL BE SPLIT (44PIN) AND CONTAIN UPPER & LOWER LEAD EDGED PLASTIC CARD GUIDES.

D. TRAFFIC UNINTERUPTED POWER SUPPLY (UPS):

THE 333SD–ITS SHALL HAVE A UPS AS SPECIFIED BELOW RACK MOUNTED IN THE LEFT CABINET.

1. OPERATION:

a. THE TRAFFIC UPS SHALL BE CAPABLE OF PRODUCING–SIMULTANEOUSLY–FULLY REGENERATED, CONDITIONED AND TRUE SINE WAVE, STANDBY AND CONTINUOUS AC OUTPUTS.

b. SUGGESTED OPERATING MODE FOR RESPECTIVE OUTPUTS DURING POWER FAILURE: CONTINUOUS OUTPUT PROVIDED FOR SIGNAL CONTROLLERS AND MODEMS; STANDBY OUTPUT PROVIDED FOR SIGNALS IN FLASH MODE OPERATION (OPTIONAL DELAY TIMER AVAILABLE FOR SHORT–TERM BATTERY RUN UNDER FULL CYCLING OPERATION).

c. UP TO THE MAXIMUM RATING, THE TRAFFIC UPS SHALL BE CAPABLE OF RUNNING ANY COMBINATION OF SIGNAL HEADS, WHETHER INCANDESCENT, LED OR NEON, BY ANY MANUFACTURER, REGARDLESS OF POWER FACTOR, WITHOUT OVERDRIVING THE POORER POWER FACTOR LED HEADS WHICH MAY CAUSE EARLY DEGRADATION, LOW LUMINOSITY OR EARLY SIGNAL FAILURE.

d. UPON LOSS OF UTILITY POWER THE TRAFFIC UPS SHALL INSERT BATTERY POWER INTO THE SYSTEM VIA A SUPPLIED POWER INTERFACE MODULE (PIM). IN CASE OF UPS FAILURE AND/OR BATTERY DEPLETION, THE PIM WILL ENSURE THAT THE UPS WILL DROP OUT AND, UPON RETURN OF UTILITY POWER, THE TRAFFIC CONTROL SYSTEM WILL DEFAULT TO NORMAL OPERATING MODE.

e. THE POWER INTERFACE MODULE SHALL ENABLE REMOVAL AND REPLACEMENT OF THE TRAFFIC UPS WITHOUT SHUTTING DOWN THE TRAFFIC CONTROL SYSTEM (i.e. "HOT SWAP" CAPABILITY). CONNECTORS SHALL BE EQUIPPED WITH A "SAFETY INTERLOCK" FEATURE.

f. FOR 2070 OR "CALIFORNIA" STYLE CABINETS UPON LOSS OF POWER THE TRAFFIC UPS SHALL ACTUATE THE EXISTING FLASH TRANSFER RELAYS (FTRs) AND MERCURY CONTACTOR (MC) TO FORCE THE TRAFFIC CONTROL SYSTEM INTO FLASH MODE OPERATION.

g. EXISTING FLASHER MODULES AND FLASH TRANSFER RELAYS SHALL BE UTILIZED.

h. TO FACILITATE EMERGENCY CREWS AND POLICE ACTIVITIES, THE TRAFFIC UPS SHALL BE COMPATIBLE WITH POLICE PANEL FUNCTIONS (i.e. "SIGNALS OFF" SWITCH MUST KILL POWER TO THE FIELD WIRING EVEN WHEN ON UPS/BATTERY POWER).

i. THE TRAFFIC UPS SHALL NOT DUPLICATE OR TAKE OVER FLASH OPERATION OR FLASH TRANSFER RELAY FUNCTIONS.

j. THE TRAFFIC UPS SHALL BE CAPABLE OF PROVIDING CONTINUOUS, FULLY CONDITIONED, REGULATED, SINUSOIDAL (AC) POWER TO SELECTED DEVICES SUCH AS SIGNAL CONTROLLERS, MODEMS, COMMUNICATION HUBS, NTCIP ADAPTERS AND VIDEO EQUIPMENT.

2. DESCRIPTION: THE TRAFFIC UPS SHALL CONSIST OF THREE MAJOR COMPONENTS, THE ELECTRONICS MODULE, THE POWER INTERFACE MODULE, AND THE BATTERY SYSTEM.

3. THE ELECTRONICS MODULE SHALL CONSIST OF THE FOLLOWING:

a. TRUE SINE WAVE, HIGH FREQUENCY INVERTER UTILIZING IGBT TECHNOLOGY.

b. 3–STAGE, TEMPERATURE COMPENSATED, BATTERY CHARGER.

c. FOR CONNECTION FROM THE ELECTRONICS MODULE TO THE POWER INTERFACE MODULE AND BATTERY SYSTEM, DEDICATED HARNESS SHALL BE PROVIDED WITH QUICK–RELEASE, KEYED, CIRCULAR CONNECTORS AND BRAIDED NYLON SLEEVING OVER ALL CONDUCTORS.

d. LOCAL AND REMOTE CONTROL OF UPS FUNCTIONS.

e. LOCAL AND REMOTE COMMUNICATIONS CAPABILITIES.

f. AND BE CAPABLE OF ACCEPTING AN NTCIP–READY ADAPTER OR A SPREAD SPECTRUM RADIO MODEM.

g. SEPARATE POWER INTERFACE MODULE (PIM) FOR INSERTING POWER SAFELY AND RELIABLY.

4. MOUNTING CONFIGURATION:

a. 2070 STYLE: MOUNTING METHOD SHALL BE 19" RACK–MOUNT. SHELF ANGLED OR RAILS, TYPICALLY SUPPLIED BY OTHERS, ARE AVAILABLE AS OPTIONAL ACCESSORIES.

5. BATTERY SYSTEM:

a. THE BATTERY SHALL BE COMPRISED OF EXTREME TEMPERATURE, DEEP CYCLE, AGM/VRLA (ABSORBED GLASS MAT/ VALVE REGULATED LEAD ACID) BATTERIES THAT HAVE BEEN FIELD PROVEN AND TESTED BY THE U.S. MILITARY.

b. THE BATTERY SYSTEM SHALL CONSIST OF ONE OR MORE STRINGS (TYPICALLY 4 OR 6 BATTERIES PER STRING) OF EXTREME TEMPERATURE, DEEP CYCLE, AGM/VRLA (ABSORBED GLASS MAT/ VALVE REGULATED LEAD ACID) BATTERIES SUCH AS CLARY OUTPOST(tm) BATTERIES OR EQUIVALENT.

c. BATTERIES SHALL BE CERTIFIED TO OPERATE AT EXTREME TEMPERATURES FROM –40*C TO +74*C.

d. THE BATTERIES SHALL BE PROVIDED WITH APPROPRIATE INTERCONNECT WIRING AND A CORROSION–RESISTANT MOUNTING TRAY AND/OR BRACKETS APPROPRIATE FOR THE CABINET INTO WHICH THEY WILL BE INSTALLED.

e. THE INTERCONNECT CABLE SHALL BE PROTECTED WITH ABRASION–RESISTANT NYLON SHEATHING.

f. THE INTERCONNECT CABLE SHALL CONNECT TO THE BASE MODULE VIA A QUICK–RELEASE CIRCULAR CONNECTOR.

g. FOR PURPOSES OF SAFETY AND PROPER OPERATION, THE CIRCULAR BATTERY CONNECTOR SHALL HAVE INTERLOCKING PINS TO PREVENT TURN–ON IF BATTERIES ARE NOT CONNECTED, AND TO SHUT OFF THE UPS SHOULD THE BATTERIES BE DISCONNECTED.

h. BATTERY CONSTRUCTION SHALL INCLUDE HEAVY–DUTY, INTER–CELL CONNECTIONS FOR LOW–IMPEDANCE BETWEEN CELLS, AND HEAVY–DUTY PLATES TO WITHSTAND SHOCK AND VIBRATION.

i. THE TOP COVER SHALL USE TONGUE AND GROOVE CONSTRUCTION AND SHALL BE EPOXIED TO THE BATTERY CASE FOR MAXIMUM STRENGTH AND DURABILITY.

j. AN OPTIONAL LIFTING HANDLE SHALL BE AVAILABLE ON BATTERY MODELS.

6. ELECTRICAL SPECIFICATIONS:

a. INPUT SPECIFICATIONS:

NOMINAL INPUT VOLTAGE – 120 VAC, SINGLE PHASE
INPUT VOLTAGE RANGE – 85 VAC TO 140 VAC
INPUT FREQUENCY – 50 OR 60Hz (+/– 5%)
INPUT CONFIGURATION – 3 WIRE (HOT, NEUTRAL & GROUND)
INPUT CURRENT (MAX DRAW) – 7.2 AMPS, POWER–FACTOR CORRECTED
INPUT PROTECTION – INPUT FUSE (12 AMPS)

b. OUTPUT SPECIFICATION:

NOMINAL OUTPUT VOLTAGE – 120 VAC, SINGLE PHASE
POWER RATING 1kVA (1000VA/700W)
OUTPUT VOLTAGE REGULATION – +/– 2% FOR 100% STEP LOAD CHANGE AND FROM HIGH BATTERY TO LOW BATTERY CONDITION
OUTPUT FREQUENCY – 50 OR 60 Hz (+/– 5%)
OUTPUT CONFIGURATION – KEYED, CIRCULAR CONNECTORS AND DUPLEX RECEPTACLE
OUTPUT WAVE FORM – TRUE SINEWAVE
OVERLOAD CAPABILITY – 110% FOR 10 MINUTES, 200% FOR 1/2 SECOND
FAULT CLEARING – CURRENT LIMIT AND AUTOMATIC SHUTDOWN
SHORT CIRCUIT PROTECTION – CURRENT LIMIT AND AUTOMATIC SHUTDOWN
EFFICIENCY – 85% AT FULL LOAD
LOAD POWER FACTOR – .7 LAGGING THROUGH UNITY TO .7 LEADING

7. PHYSICAL SPECIFICATIONS, UPS ELECTRONICS MODULE:

a. DIMENSIONS:
RACK–MOUNT: WIDTH = 19", DEPTH = 12", HEIGHT = 3.5" (2U)
SHELF MOUNT: WIDTH = 19", DEPTH = 12", HEIGHT = 3.5"
WALL–MOUNT/UNISTRUT RAIL MOUNT: WIDTH = 6.9", DEPTH = 9.5", HEIGHT = 16"
SEPARATE POWER–INTERFACE MODULE: WIDTH = 6", DEPTH = 2.8", HEIGHT = 9"

b. WEIGHT:
UPS = 20LBS., SHIPPING WEIGHT = 25LBS.

8. ENVIRONMENTAL SPECIFICATIONS:

a. THE UPS SHALL MEET OR EXCEED NEMA TEMPERATURE STANDARDS FROM –40*C TO +74*C.

b. THE UPS SHALL BE CERTIFIED AND FIELD PROVEN TO MEET OR EXCEED NEMA TEMPERATURE STANDARDS. A CERTIFICATE OF COMPLIANCE SHALL BE MADE AVAILABLE UPON REQUEST.

9. BATTERY SPECIFICATIONS:

a. THE BATTERY SYSTEM SHALL BE CERTIFIED AND FIELD PROVEN TO MEET OR EXCEED NEMA TEMPERATURE STANDARDS FROM –40*C TO +74*C.

b. AMPERE– HOUR RATINGS (SEE TABLE 1)

c. HYDROGEN GAS EMISSIONS MUST MEET MIL–SPEC #MIL–B–8565J

d. DIMENSIONS – (SEE TABLE 1)

e. WEIGHTS – (SEE TABLE 1)

10. COMMUNICATIONS, CONTROLS & DIAGNOSTICS:

a. ALARM FUNCTION MONITORING: THE UPS SHALL COME STANDARD WITH A DB–9F CONNECTOR WITH OPEN COLLECTORS (40V@20mA) INDICATING, LOSS OF UTILITY POWER, INVERTER FAILURE AND LOW BATTERY.

b. AN RS232 INTERFACE SHALL BE PROVIDED VIA A DB–9F CONNECTOR ALLOWING FULL, INTERACTIVE, REMOTE COMPUTER MONITORING AND CONTROL OF THE UPS FUNCTIONS.

c. FRONT PANEL CONTROLS: POWER ON, COLD (DC) START, ALARM SILENCE, BATTERY TEST, BYPASS BREAKER, AND DC/BATTERY BREAKER.

11. RELIABILITY:

a. CALCULATED MTBF IS 100,000 HOURS BASED ON COMPONENT RATINGS.

b. WHEN BYPASS AND POWER INTERFACE MODULE ARE INCLUDED, SYSTEM MTBF INCREASES TO 150,000 HOURS.

12. OPTIONS:

a. BATTERY TRAY TO HOLD SIX (6) OP72A BATTERIES, UP TO FOUR (4) OP72B OR OP72C BATTERIES, AND UP TO THREE (3) OP72D BATTERIES. TRAY IS 19" WIDE FOR USE IN 170 TYPE CABINETS AND MOUNTS ON STANDARD RETMA RAILS.

b. SWING–OUT BATTERY BOX, MOUNTS ON RIGHT RAIL INSIDE BACK DOOR OF 170 TYPE CABINETS. BOX IS DESIGNED TO HOLD SIX (6) OP72A BATTERIES, UP TO FOUR (4) OP72B OR OP72C BATTERIES, AND UP TO THREE (3) OP72D BATTERIES.

c. ADJUSTABLE DELAY–TIMER TO PROVIDE UP TO 10 HOURS OF FULL CYCLING WHILE ON BATTERY BEFORE SWITCHING TO FLASH MODE (ONLY AVAILABLE WHERE 100% LOW–POWER/LED SIGNALS AND PED HEADS ARE USED) BATTERIES MUST BE SIZED PROPERLY TO FULLY UTILIZE THIS FEATURE.

d. SERVICE PEDESTAL–MOUNTING OPTION.

e. ONE–SHOT GROUND PULSE TO TRIGGER EXTERNAL START UPON RETURN OF AC POWER.

f. DIAL–OUT MODEM FOR WIRELESS OR LAND LINE COMMUNICATION.

g.ENHANCED BATTERY CHARGER PROVIDES ACCELERATED CHARGING CAPACITY (CONTACT FACTORY FOR DETAILS AND PROPER APPLICATION)

13. SERVICEABILITY & MAINTAINABILITY:

a. MTTR (MEAN–TIME–TO–REPLACE OR REPAIR)
ELECTRONICS = 15 MINUTES OR LESS,
BATTERY SYSTEM = 15 MINUTES OR LESS.

14. WARRANTY: STANDARD WARRANTY TERMS COVER ENTIRE TRAFFIC UPS INCLUDING BATTERY. TERMS ARE ONE–YEAR PARTS AND LABOR WITH LABOR F.O.B. FACTORY.

15. ALL OF THE ABOVE COMPONENTS PROVIDED ON THE PROJECT, EXCLUDING THE SIGNAL MONITOR UNIT, SHALL BE ON THE KANSAS QUALIFIED PRODUCTS LISTING.

16. A LIGHT SHALL BE MOUNTED ON TOP OF THE CABINET THAT WILL BE ON INDICATING WHEN SIGNAL IS OPERATING IN BATTERY BACK–UP.

TABLE 1

	ESTIMATED RUNTIME (assumes 77*F/25*C, to 1.75 volts per cell).			Unit Weight	Overall Dimensions Per Battery Inches (cm.)		
Volts/ A-hrs.	200 Watts	400 Watts	800 Watts	Lbs. (Kg.)	Length L	Width W	Height H
12 VDC 16 A-h	3.5 Hrs	1.73 Hrs	52 Min.	14.7 (6.7)	7.27 (18.46)	3.11 (7.89)	6.67 (16.93)
12 VDC 31 A-h	8.8 Hrs	3.8 Hrs	1.8 Hrs	23 (10.5)	7.68 (19.51)	5.15 (13.08)	7.22 (18.34)
12 VDC 39 A-h	11.3 Hrs	5.5 Hrs	2.3 Hrs	29 (13.2)	7.68 (19.51)	5.15 (13.08)	8.50 (21.59)
12 VDC 48 A-h	13.7 Hrs	6.7 Hrs	2.9 Hrs	32 (14.5)	9.41 (23.90)	5.22 (13.26)	9.35 (23.75)

*OP72X battery sets include six (6) batteries per set. Wired in series, each set provides 72 VDC.

NO.	DATE:	REVISION	BY:	APP'D
2	07–06–10	ADD CONTROLLER SPEC UNDER IX	KAP	LGV
1	01–14–08	ADD 333SD–ITS CONTROLLER DETAIL	KAP	LGV

DRAWN BY: K.PELTON

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STANDARD DETAILS

TRAFFIC SIGNAL SPECIFICATIONS

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