BID FORM

MISSOURI DEPARTMENT OF TRANSPORTATION
GENERAL SERVICES
2309 Barrett Station Rd.,
Ballwin, MO. 63021

REQUEST NO.	SL15-090-RW
DATE	April 27, 2015

SEALED BIDS, SUBJECT TO THE ATTACHED CONDITIONS WILL BE RECEIVED AT THIS OFFICE UNTIL

10:00 a.m., Local Time, May 21, 2015

AND THEN PUBLICLY OPENED AND READ FOR FURNISHING THE FOLLOWING SUPPLIES OR SERVICES.

BIDS TO BE BASED F.O.B. MISSOURI DEPARTMENT OF TRANSPORTATION
Submit net bid as cash discount stipulations will not be considered

St. Louis Signal Bldg.
2309 Barrett Station Rd.
Ballwin, MO. 63021

BUYER: **Teresa (Terri) Mount**
BUYER EMAIL:
Teresa.Mount@modot.mo.gov

BUYER TELEPHONE: 314-301-1431

SUPPLIES OR SERVICES

Traffic Controller Cabinets

To establish a contract to furnish **"Traffic Controllers Cabinets"** with an effective date of Notice to Proceed and ending September 30, 2016 in accordance with the following pages.

***NOTE: It is the responsibility of the Bidder to access MoDOT's website in order to obtain any and all addenda(s) issued during the course of this RFB process.**

All questions regarding this RFB shall be submitted to the RFB Coordinator/Contact.

(SEE ATTACHED FOR CONDITIONS AND INSTRUCTIONS)

In compliance with the above Request For Bid, and subject to all conditions thereof, the undersigned bidder agrees to furnish and deliver any or all the items on which prices were bid within the timeframe specified herein, after receipt of formal purchase order.

Date: _____
Telephone No.: _____
Fax No.: _____
Email Address: _____

Firm Name: _____
Address: _____
_____
By (Signature): _____
Type/Print Name _____
Title:
Is your firm WBE certified? ☐ Yes ☐ No

1. INTRODUCTION AND GENERAL INFORMATION

1.1 Introduction:

1.1.1 This Request for Bid seeks bids from qualified organizations to provide **traffic signal cabinets**, with an effective contract period of Notice to Proceed through September 30, 2016, to the Missouri Highways and Transportation Commission (MHTC) and Missouri Department of Transportation (MoDOT). All questions regarding the RFB shall be submitted to Teresa (Terri) Mount Bids must be returned to the office of General Services Procurement, St. Louis, no later than 10:00 ., Local Time, May 21, 2015.

RFB Coordinator:
Teresa (Terri) Mount
Missouri Department of Transportation
General Services – Procurement- St. Louis

Phone: **314-301-1431**
E-mail: **Teresa.Mount@modot.mo.gov**

1. SCOPE OF WORK

1.1 General Requirements:

1.1.1 The contractor shall provide *NEMA TS1 signal cabinets- no controllers or MMU* (hereinafter referred to as "traffic signal cabinets") on an as needed, if needed basis for the Missouri Highway and Transportation Commission (MHTC) and Missouri Department of Transportation (MoDOT), in accordance with the provisions, phase sheets and requirements stated herein.

1.1.2 The contractor shall provide all deliverables/services to the sole satisfaction of the MoDOT.

1.1.3 MoDOT estimates, but does not guarantee, the purchase of the estimated quantities stated herein.

1.1.4 MoDOT reserves the right to obtain "like or similar" products as specified herein from other manufacturers, exclusive of the contract, when use of such products is deemed in the best interest of the MoDOT.

1.1.5 Unless otherwise specified herein, the contractor shall furnish all material, labor, facilities, equipment, and supplies necessary to provide the deliverables/services required herein.

1.2 Specific Requirements:

1.2.1 The contractor shall insure all materials, equipment, and/or services comply with the attached MoDOT specifications, and as specified in any other provisions outlined in the solicitation document.

1.2.2 The contractor shall insure traffic cabinets are built according to the attached specifications and wired according to the attached individual *Traffic Signal Controller Order Forms*.

1.2.3 The contractor shall provide traffic cabinets in which all boxes required to complete the traffic controller assembly are packaged together as one.

1.2.4 The contractor shall agree and understand that only items on the latest revision of the MoDOT Approved Products List for Traffic Signals and Highway Lighting Equipment will be accepted.

1.3 Delivery Requirements:

1.3.1 The contractor shall deliver the specified traffic cabinets to MoDOT St. Louis District , Signals 2309 Barrett Station Road, Ballwin, MO. 63021.

1.3.2 The contractor shall not deliver any traffic cabinets to MoDOT until being notified by MoDOT by telephone or purchase order.

1.3.3 The contractor shall deliver traffic controllers at the specified location within 90 calendar days after the issue date of a purchase order.

1.3.4 The contractor shall agree and understand that MoDOT shall not receive any deliveries on a Saturday or Sunday.

1.4 Additional Requirements:

1.4.1 The contractor shall agree and understand that all traffic controllers/ cabinets shall be subject to a twenty (20) day acceptance period, which includes fifteen (15) days for testing the equipment and five (5) days for the contractor to repair or replace any defective equipment.

a. The test period shall begin no later than fifteen (15) days after the date the equipment is received. Any failure or malfunction of the equipment during the test period shall be corrected at the contractor's expense. The equipment shall then be tested for an additional fifteen (15) days. The procedure shall be repeated until the equipment has operated to the state's satisfaction for fifteen (15) consecutive days.

1.5 Liquidated Damage Requirements:

1.5.1 The contractor shall agree and understand that providing traffic controller cabinets in accordance with the requirements stated herein is considered critical to the efficient operations of the MoDOT. However, since the amount of actual damages would be difficult to establish in the event the contractor fails to comply with the contractual requirements, the contractor shall agree and understand that the amount identified below as liquidated damages shall be reasonable and fair under the circumstances.

a. In the event the contractor fails to provide traffic controllers in accordance with the contractual requirements specified herein, the contractor shall be assessed liquidated damages in the amount of $50.00 per controller/ cabinet per day for each such delinquent day after the twenty (20) day acceptance period.

b. The contractor shall further agree and understand that such liquidated damages shall either be deducted from the total amount due the contractor or paid by the contractor as a direct payment to the MoDOT, at the sole discretion of the MoDOT.

c. The contractor shall understand that the liquidated damages described herein shall not be construed as a penalty.

d. The contractor shall understand and agree that all assessments of liquidated damages shall be within the discretion of each District as a separate entity, and shall be in addition to, not in lieu of, the rights of the State of Missouri to pursue other appropriate remedies. The contractor shall understand and agree that each District's decision shall be individual, final, and without recourse.

e. The contractor shall agree and understand that all assessments of liquidated damages shall be within the discretion of the State of Missouri and shall be in addition to, not in lieu of, the rights of the State of Missouri to pursue other appropriate remedies.

1.6 Invoicing and Payment Requirements:

1.6.1 The contractor shall submit an itemized invoice to the applicable requesting address, as specified herein.

1.6.2 The contractor shall be paid in accordance with the firm, fixed price(s) stated on the pricing page of this document, after completion of deliverables specified herein and acceptance by MoDOT.

1.6.3 Other than the payment specified above, no other payments or reimbursements shall be made to the contractor for any reason whatsoever.

1.6.4 Unless otherwise provided for in the solicitation documents, payment for all equipment, supplies, and/or services required herein shall be made in arrears. The Missouri Highways and Transportation Commission (MHTC) shall not make any advance deposits.

1.6.5 The MHTC assumes no obligation for equipment, supplies, and/or services shipped or provided in excess of the quantity ordered. Any authorized quantity is subject to the MHTC's rejection and shall be returned at the contractor's expense.

1.6.6 The MHTC reserves the right to purchase goods and services using the state-purchasing card.

1.7 Other Contractual Requirements:

1.7.1 Contract Period - The contract shall commence from the Notice to Proceed until September 30, 2016.

1.7.2 Inspection Specifications - MoDOT reserves the right to inspect the material at the point of manufacture, intermediate storage point, or at a destination which shall be at the discretion of MoDOT.

TRAFFIC CONTROLLER ASSEMBLY EQUIPMENT LIST
NEMA Traffic Signal Controller Assemblies

The following list shall be completed and returned with the bid. Equipment shall meet Missouri's Standard Specifications for Highway Construction and Approved Products List. Equipment shall be agreed to and approved prior to the contract award. All delivered equipment shall be the products listed below.

***New Controllers shall be fully assembled and furnished* <u>WITH J-Bolts</u>.**

***Replacement Controllers shall be fully assembled and furnished* <u>WITHOUT J-Bolts</u>.**

<u>Item</u>	**<u>Manufacturer</u>**	**<u>Catalog Number</u>**
Please circle one:	TS1 or TS2	
Cabinet and Back Panel Assembly	_____	_____
NEMA Controller	**NOT APPLICABLE**	
Conflict Monitor	**NOT APPLICABLE**	_____
Load Switch	_____	_____
Flasher	_____	_____
Flash Transfer Relay	_____	_____
Surge Protector	_____	_____
Controller Breaker	_____	_____
Auxiliary Breaker	_____	_____
Power Supply (Card Rack Detectors)	_____	_____
Detector, Induction Loop (2 Channel-Rack Mounted)	_____	_____

_____ _____ _____

_____ _____ _____

Signed: _____ Title: _____ Date: _____

3. BID SUBMISSION

2.1 Bid Submission Information:

2.1.1 All bids must be received in a sealed envelope clearly marked "**Traffic Controllers**".

2.1.2 All bids must be received at the following address no later than May 21, 2015 at 10:00 a.m., Local time.

The Missouri Department of Transportation
General Services – Procurement Division
Attn: Teresa Mount

2309 Barrett Station Road,
Ballwin, MO. 63021

2.1.3 The bidder should complete and submit a copy of *Equipment List for NEMA Traffic Signal Cabinets and/ Traffic Signal Controller* with the bid, listing each component with the manufacturer name, and model number.

2.1.4 The bidder may withdraw, modify or correct his bid after it has been deposited with MoDOT provided such request is submitted in writing and received at the location designated for the bid opening prior to the time specified for opening bids. Such a request received as specified will be attached to the bid and the bid will be considered to have been modified accordingly. With the exception of the equipment list specified herein, no bid may be modified after the time specified for the opening of bids.

2.1.5 Bids will be reviewed to determine if the bid complies with the mandatory requirements, and to determine the lowest and best bid.

2.1.6 *Cost Determination* – The low bid shall be determined by multiplying the estimated quantity with the unit price, to obtain a total price.

2.1.7 *Contract Award* – The contract will be awarded to the lowest responsive bidder determined as specified above.

a. Award of this bid will be made on a using the "lowest and best" principle of award.

2.1.8 MHTC reserves the right to reject any or all bids, and no award is final until formally approved by the MHTC.

a. Notification of award shall be at the time the tabulation is posted to the Internet. It is the sole responsibility for all bidders to check the website for bid results.

3. PRICING PAGE

3.1 NEMA TS1 Traffic Signal Cabinets - The bidder shall provide firm, fixed prices in the table below for providing the deliverables/services in accordance with the provisions and requirements of this RFB. All costs associated with providing the required deliverables/services shall be included in the prices stated below.

TRAFFIC Signal Cabinets – TS1				
Item #	**Description and C/S Code**	**Estimated Qty.**	**Firm, Fixed Price,** ***per unit***	**Extended Price**
001	NEMA TS1 Traffic Signal with TS1 Cabinet –St. Louis	11	**$_____** ***per unit***	**$_____** ***total***

_____ _____

Signature ***Date***

VENDOR INFORMATION & PREFERENCE CERTIFICATION FORM

Vendor Information
All bidders must furnish ALL applicable information requested below

Vendor Name/Mailing Address:	**Vendor Contact Information (including area codes):**
Email Address:	Phone #: Cellular #: Fax #:
Printed Name of Responsible Officer or Employee:	**Signature:**
For Corporations - State in which incorporated:	**For Others -** State of domicile:

If the address listed in the Vendor Name/Mailing Address block above is not located in the State of Missouri, list the address of Missouri offices or places of business:

If additional space is required, please attach an additional sheet and identify it as ***Addresses of Missouri Offices or Places of Business.***

M/WBE INFORMATION: List all certified Minority or Women Business Enterprises (**M/WBE**) utilized in the fulfillment of this bid. Include percentages for subcontractors and identify the M/WBE certifying agency:

M/WBE Name	Percentage of Contract	M/WBE Certifying Agency

If additional space is required, please attach an additional sheet and identify it as ***M/WBE Information***

Preference Certification
All bidders must furnish ALL applicable information requested below

GOODS/PRODUCTS MANUFACTURED OR PRODUCED IN USA: If any or all of the goods or products offered in the attached bid which the bidder proposes to supply to the MHTC are **not** manufactured or produced in the "United States", or imported in accordance with a qualifying treaty, law, agreement, or regulation, list below, by item or item number, the country other than the United States where each good or product is manufactured or produced.

Item (or item number)	Location Where Item is Manufactured or Produced

If additional space is required, please attach an additional sheet and identify it as ***Location Products are Manufactured or Produced****.*

MISSOURI SERVICE-DISABLED VETERAN BUSINESS: Please complete the following if applicable. Additional information may be requested if preference is applicable. See below definitions for qualification criteria:

Service-Disabled Veteran is defined as any individual who is disabled as certified by the appropriate federal agency responsible for the administration of veterans' affairs.

Service-Disabled Veteran Business is defined as a business concern:

a. Not less than fifty-one (51) percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than fifty-one (51) percent of the stock of which is owned by one or more service-disabled veterans; and
b. The management and daily business operations of which are controlled by one or more service-disabled veterans.

Veteran Information	Business Information
Service-Disabled Veteran's Name (Please Print)	Service-Disabled Veteran Business Name
Service-Disabled Veteran's Signature	Missouri Address of Service Disabled Veteran Business

COOPERATIVE AGREEMENT NOTICE

The Department is interested in assisting Missouri governmental entities, etc. in purchasing equipment, various materials, and supplies that meet the MoDOT specifications.

Each bidder is asked to indicate below whether they would be willing to offer **Traffic Signal Cabinets** listed in the attached "Request for Bid" for sale to these local political entities at the same bid price offered to this Department.

It is understood the Department will not issue purchase orders, accept delivery nor make payment for these items ordered by any of these agencies. It is further understood the price is based on the **Traffic Signal Cabinets** meeting the Department specifications. Any added options, deletions, or extra freight costs would be negotiated between the local agency and the successful vendor.

Indicate below whether your company is willing to offer such cooperative purchasing for Missouri counties, cities or other political entities.

YES _____ NO _____

If the price varies throughout the state on Department bids because of different delivery destinations, please indicate the price f.o.b. your location that would be offered as described.

F.O.B. Location _____

Indicate the deadline date that orders will be accepted. _____

COMPANY NAME _____

ADDRESS _____

PHONE NUMBER _____

SIGNATURE _____

TITLE _____

DATE _____

(Each vendor should complete the appropriate sections of form and submit with bid.)

a. The solicitation for the procurement of the supplies referenced therein, to which these "Standard Bid Provisions, General Terms and Conditions and Special Terms and Conditions" are attached, is being issued under, and governed by, the provisions of Title 7 – Missouri Department of Transportation, Division 10 – Missouri Highways and Transportation Commission, Chapter 11 – Procurement of Supplies, of the Code of State Regulations. The Missouri Highways and Transportation Commission (**MHTC**), acting by and through its operating arm, the Missouri Department of Transportation (**MoDOT**), draws the Bidder's attention to said 7 CSR 10-11 for all the provisions governing solicitation and receipt of bids/quotes and the award of the contract pursuant to this solicitation.

b. All bids/quotes must be signed with the firm name and by a responsible officer or employee. Obligations assumed by such signature must be fulfilled.

GENERAL TERMS AND CONDITIONS

Definitions

Capitalized terms as well as other terms used but not defined herein shall have the meaning assigned to them in section 7 CSR 10-11.010 Definition of Terms.

Nondiscrimination

a. The Contractor shall comply with all state and federal statutes applicable to the Contractor relating to nondiscrimination, including, but not limited to, Chapter 213, RSMo; Title VI and Title VII of Civil Rights Act of 1964 as amended (42 U.S.C. Sections 2000d and 2000e, *et seq.*); and with any provision of the "Americans with Disabilities Act" (42 U.S.C. Section 12101, *et seq*).

b. Sanctions for Noncompliance: In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, MHTC shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

   i. withholding of payments to the Contractor under the contract until the Contractor complies, and/or,
   ii. cancellation, termination or suspension of the contract, in whole or in part.

Contract/Purchase Order

a. By submitting a bid/quote, the Bidder agrees to furnish any and all equipment, supplies and/or services specified in the solicitation documents, at the prices quoted, pursuant to all requirements and specifications contained therein.

b. A binding contract shall consist of: (1) the solicitation documents, amendments thereto, and/or Best and Final Offer (BAFO) request(s) with any changes/additions, (2) the Contractor's bid response, and (3) the MHTC's acceptance of the bid by post-award contract or purchase order.

c. A notice of award does not constitute an authorization for shipment of equipment or supplies or a directive to proceed with services. Before providing equipment, supplies and/or services, the Contractor must receive a properly authorized notice to proceed and/or purchase order.

Applicable Laws and Regulations

a. The contract shall be construed according to the laws of the State of Missouri. The Contractor shall comply with all local, state, and federal laws and regulations related to the performance of the contract. The exclusive venue for any legal proceeding relating to or arising, out of the contract shall be in the Circuit Court of Cole County, Missouri.

b. The Contractor must be registered and maintain good standing with the Secretary of State of the State of Missouri, Missouri Department of Revenue, and other regulatory agencies, as may be required by law or regulations. Prior to the issuance of a purchase order and/or notice to proceed, the Contractor may be required to submit to MHTC a copy of their current Authority Certificate from the Secretary of State of the State of Missouri and/or a copy of their Certificate of No Tax Due from the Missouri Department of Revenue.

c. Prior to the issuance of a purchase order and/or notice to proceed, all **out-of-state** Contractors **providing services** within the state of Missouri must submit to MHTC a copy of their current Transient Employer Certificate from the Missouri Department of Revenue, in addition to a copy of their current Authority Certificate from the Secretary of State of the State of Missouri.

Executive Order:

The Contractor shall comply with all the provisions of Executive Order 07-13, issued by the Honorable Matt Blunt, Governor of Missouri, on the sixth (6^{th}) day of March, 2007. This Executive Order, which promulgates the State of Missouri's position to not tolerate persons who contract with the state engaging in or supporting illegal activities of employing individuals who are not eligible to work in the United States, is incorporated herein by reference and made a part of this Agreement.

1) "By signing this Agreement, the Contractor hereby certifies that any employee of the Contractor assigned to perform services under the contract is eligible and authorized to work in the United States in compliance with federal law."
2) In the event the Contractor fails to comply with the provisions of the Executive Order 07-13, or in the event the Commission has reasonable cause to believe that the contractor has knowingly employed individuals who are not eligible to work in the United States in violation of federal law, the Commission reserves the right to impose such contract sanctions as it may determine to be appropriate, including but not limited to contract cancellation, termination or suspension in whole or in part or both.
3) The Contractor shall include the provisions of this paragraph in every subcontract. The Contractor shall take such action with respect to any subcontract as the Commission may direct as a means of enforcing such provisions, including sanctions for noncompliance.

Preferences

a. In the evaluation of bids/quotes, preferences shall be applied in accordance with 7 CSR 10-11.020(7). Contractors should apply the same preferences in selecting subcontractors. The attached document entitled **"VENDOR INFORMATION AND PREFERENCE CERTIFICATION FORM"** must be completed and returned with the solicitation documents.

b. Bidders are encouraged to obtain minority business enterprise (MBE) and women business enterprise (WBE) participation in this work through the use of subcontractors, suppliers, joint ventures, or other arrangements that afford meaningful participation for M/WBEs. Bidders are encouraged to obtain 10% MBE and 5% WBE participation.

Cancellation of Contract

The MHTC may cancel the Contract at any time for a material breach of contractual obligations or for convenience by providing Contractor with written notice of cancellation. Should the MHTC exercise its right to cancel the contract for such reasons, cancellation will become effective upon the date specified in the notice of cancellation sent to the Contractor.

Bankruptcy or Insolvency

Upon filing for any bankruptcy or insolvency proceeding by or against the Contractor, whether voluntarily, or upon the appointment of a receiver, trustee, or assignee, for the benefit of creditors, the Commission reserves the right and sole discretion to either cancel the Agreement or affirm the Agreement and hold the Contractor responsible for damages.

Warranty

The Contractor expressly warrants that all equipment, supplies, and/or services provided shall: (1) conform to each and every specification, drawing, sample or other description which was furnished to or adopted by the MHTC, (2) be fit and sufficient for the purpose expressed in the solicitation documents, (3) be merchantable, (4) be of good materials and workmanship, and (5) be free from defect.

Status of Independent Contractor

The Contractor represents itself to be an independent Contractor offering such services to the general public and shall not represent itself or its employees to be an employee of the MHTC. Therefore, the Contractor shall assume all legal and financial responsibility for taxes, FICA, employee fringe benefits, workers' compensation, employee insurance, minimum wage requirements, overtime, etc., and agrees to indemnify, save and hold the MHTC, its officers, agents and employees harmless from and against any and all losses (including attorney fees) and damage of any kind related to such matters.

Non-Waiver

If one of the parties agrees to waive its right to enforce any term of this Contract, that party does not waive its right to enforce such term at any other time or to enforce any or all other terms of this Contract.

Indemnification

The Contractor shall defend, indemnify and hold harmless MHTC, including its members and department employees, from any claim or liability whether based on a claim for damages to real or personal property or to a person for any matter relating to or arising out of the Contractor's performance of its obligations under the contract awarded pursuant to this solicitation.

SPECIAL TERMS AND CONDITIONS

Temporary Suspension of Work

a. The **District Engineer** shall have authority to suspend work wholly or in part for such period or periods as may be deemed necessary when weather or other conditions are such that in the opinion of the engineer, the work may be done at a later time with advantage to MoDOT or for failure on the part of the Contractor to comply with any of the provisions of the Contract.
b. If MoDOT suspends the work for its own advantages and not because of the Contractor's failure to comply with the Contract, the Contractor will be allowed an equal number of calendar days after the completion date for the completion of the work. MoDOT may at its discretion give the Contractor an extension of time for completing the work where the Contractor incurs delays for causes beyond his control.
c. Normal rainfall is not considered a cause qualifying for an extension of time. Claim for extension of time for all causes must be submitted by the Contractor in writing within **30 Days** after the claimed cause for the delay has ceased to exist.

MISSOURI DEPARTMENT OF TRANSPORTATION
NEMA TS2 TRAFFIC CONTROLLER ASSEMBLIES

The equipment shall conform to the latest revision of Section 1092 of the Missouri Standard Specifications for Highway Construction and the following:

1. Controller operation shall comply with the phasing shown on the attached controller order form.

2. Time-delay-to-call shall be integral with detectors so indicated. Calling detectors shall be supplied where indicated.

3. Cabinets indicated for side of pole mounting shall be furnished with the bottom undrilled or with a plate of the same cabinet material, covering 85 percent of the bottom area, attached to the bottom with four, 1/4 inch diameter bolts.

4. Furnish three complete operation manuals for all equipment, including but not limited to controllers, conflict monitors, detectors and auxiliary equipment. Furnish four complete cabinet wiring diagrams with each controller. The cabinet wiring diagrams shall include labeling for all field terminal connections and shall provide an orientation of the terminal layout that conforms with the intersection information supplied.

5. TS2 Controller Assembly Requirements:

A. Traffic Controller Assemblies. Traffic controller assemblies are defined as the complete assembly of all required equipment and components for control of traffic signal indications. Traffic controller assemblies shall conform to the requirements of the latest revision of NEMA Standards Publications No. TS 2, hereafter called NEMA. Each assembly shall consist of a controller cabinet, controller unit, back panel, malfunction management unit, all required wiring, switches and connectors and all other equipment as defined in these specifications and as shown on the plans. Double controller assemblies to control two intersections shall consist of a controller cabinet, two controller units, two back panels, two malfunction management units all required wiring, switches and connectors and all other equipment as defined in these specifications and as shown on the plans.

1. General.

a. Voltage and Temperature Variations. Variations in the voltage of the power supply from 89 to 135 volts or sustained temperatures inside the cabinet between –30 F(-34 C) and +165 F (+74 C) shall not change the timing of any functions or cause electrical or mechanical damage. Heater elements shall not be used to attain compliance with these requirements.

b. Fuse Protection. All controllers and other specified auxiliary equipment shall be properly protected with fuses on each applicable unit. Fuses shall be installed in ¼ twist or screw-in type fuse holders or shall be automotive blade-type fuses. Pop-out fuse holders shall not be used. There shall be no exposed high voltage contacts on the outside of any unit.

c. Warranty. All controller units, on-street system masters, malfunction management units, terminals and facilities, detectors and any other auxiliary unit(s) provided as specified shall be warranted by the manufacturer to be free from defects in workmanship and material for at least one year from the date of project acceptance. Any components found to be defective during the warranty period shall be replaced free of charge. All warranties provided shall be transferred to the Commission upon project acceptance. No direct payment will be made for warranties.

2. Controller Units (CU). This section supplements NEMA in describing the general specifications for actuated solid-state controller units. If requested by the engineer, the contractor shall provide a prototype controller for testing and evaluation.

a. CU Configuration.

(i) CU shall be NEMA Actuated Type 2 with the following connectors:

Port 1
Port 2
Port 3
Connector A
Connector B
Connector C
Connector D

(ii) Cus shall be capable of operation of a minimum of 12 vehicle and pedestrian phases and 8 overlaps.

(iii) All phases and overlaps shall be activated or inactivated by program entry.

b. Actuated Coordination. Actuated coordination shall conform to NEMA and the following:

(i) Signal phases controlling the movements on which signal progression is desired (coordinated phases) shall be

serviced during a guaranteed period as specified by programming. While under coordination, the designated coordinated phase(s) shall be capable of releasing from a hold status and operating in the actuated mode. The CU shall operate in actuated mode from a designated hold release point to the corresponding force off point(s) of the coordinated phase(s). If the coordinated phase(s) gaps out or reaches the force off point and there is a conflicting phase with a call or recall, the CU shall terminate the coordinated phase(s) and service the next phase in the sequence with a call or recall.

(ii) For non-coordinated actuated phases, vehicle and pedestrian detectors shall remain active. The non-coordinated actuated phases may gap out prior to the force off point or shall be forced off at the force-off point and the next phase in the sequence with a call or recall shall be serviced. The coordinator shall provide selectable recall by signal plan for non-coordinated phases. The coordinator shall be capable of fixed time operation for any and all active phases by timing plan.

(iii) The coordinator shall be capable of generating individual force-off points for each available phase in each timing plan even though it may not be necessary to use all of phases. The position of the force-off points shall be settable at any percentage point or seconds in any selected timing plan. The coordinator shall be capable of placing force-off points at fixed points in the cycle or floating points as selected by programming. With floating force-offs split times govern the force-off point in each cycle regardless of the starting point of the phase.

(iv) The coordinator shall have all of the following methods of synchronizing to the master sync pulse:

(1) Dwell. The coordinator shall establish a new offset by stopping the cycle timer in the coordinated phase(s) green, until the new offset value is reached.

(2) Dwell with Interrupt. The coordinator shall establish a new offset by stopping the cycle timer in the coordinated phase(s) green. The maximum time the coordinator can dwell shall be adjustable from 1 to 99 seconds.

(3) Shortway. The coordinator shall establish a new offset by the shortest route possible.

(v) For hardwire systems, if the sync monitor detects a fault the controller shall revert to internal time based control unless no time based control is programmed. In that case, the CU shall revert to free mode.

(vi) A MoDOT D-plug shall be provided between the D-plug on the controller and the interconnect panel on the cabinet. In the absence of the sync signal, the coordination interface shall be configured to cause the controller to default to free operation. Configuration of the MoDOT D-plug shall be as follows:

Pin	**Assignment**	**Pin**	**Assignment**	**Pin**	**Assignment**
D1	Cycle 1	D10	Split 4	D19	Future (Pre-empt 4)
D2	Cycle 2	D11	Offset 1	D20	Flash
D3	Cycle 3	D12	Offset 2	D21	Hardwire Interconnect[a]
D4	Cycle 4	D13	Offset 3	D22	Future
D5	Future (Cycle 5)	D14	Future (Offset 4)	D23	Future
D6	Future (Cycle 6)	D15	Future (Offset 5)	D24	Future
D7	Split 1	D16	Pre-empt 1	D25	Future
D8	Split 2	D17	Pre-empt 2		
D9	Split 3	D18	Pre-empt 3		

(vi) The MoDOT D-plug shall be a Cinch TRW Super D Connection as follows:

1 – Part #TB 25P	Plug	1 – Part #SHD-25GL	Hood with Latch
1 – Part #TB 25SLB-1	Socket	1 – Part #SHD-25GFCS	Hood with Filler Ends

c. Time Base Control. Time Base Control shall conform to NEMA and the following:

(i) The CU shall be zero time based, settable to the second, programmable for 52 weeks, accommodate at least 3 weekly programs, 12 day programs and not less than 12 exception day programs. Total event changes shall not be less than 160. It shall be possible to interrogate the CU to determine the year, month, day, hour, minute, second, a.m. and p.m., as well as program information programmed in the unit. Indicators shall show the condition of all outputs.

(ii) The first program of the day shall be implemented at the beginning of the minute selected. When changing from one cycle length to another while in the coordination mode, the change to the new cycle length shall not occur until the present cycle length has terminated. If the controller is operated in the free mode between cycle lengths, the next cycle length programmed shall begin at the beginning of the minute selected.

(iii) The CU shall be capable of generating a daily reference point at which time all coordinated cycles are resynchronized. This daily reference point shall be either 12:00 midnight or a selectable time of which 12:00 midnight could be selected. The resynchronization reference time is an arbitrary point in time that marks the beginning of all cycles on a daily basis.

(iv) The CU shall be capable of generating an absolute reference point at which time all coordinated cycles are resynchronized. This absolute reference point shall be a selectable time by date and hour and minute that marks the beginning of all cycles.

(v) Timing base shall be the 60 hertz power line frequency. Timing error shall not exceed plus or minus one second per month from any adjacent CU operating from the same power company substation. Timing error due to power failure or low voltage shall not exceed plus or minus 0.005 percent.

d. Detector Functions. The CU shall allow vehicle and pedestrian detector inputs to be programmed to any available phase. In addition to normal detector operation, the CU shall have the following programmable functions for vehicle detector inputs.

(i) Call Detector. A mode of operation where the detection of a vehicle places a locking call into the assigned phase when the assigned phase is not green.

(ii) Detector Switching. Besides the normal assigned phase, the detector input can be programmed to switch to a secondary phase while the secondary phase is green and the assigned phase is not green. In all other conditions the detector input acts as a normal detector input for the assigned phase.

(iii) Extend Function. While the assigned phase is green, each detector actuation input is extended a programmed amount of time with a range of at least 0 to 99 seconds.

(iv) Delay Function. While the assigned phase is not green each detector actuation input is delayed a programmed amount of time with a range of at least 0 to 99 seconds.

e. Special Functions. Any special functions, special sequences, or modes of operation specified in the plans or required to operate the specified signal phasing and timing shall be included in the programming capability of the CU.

3. Malfunction Management Unit (MMU). Each controller assembly shall contain a malfunction management unit external to the controller circuitry conforming to NEMA. When the MMU actuates flashing operation, the controller shall freeze or stop timing with the stop time switch in Normal position in the condition causing the actuation until manually reset.

a. Phases or overlaps with only one signal head shall have load resistors installed across the outputs to prevent a single lamp failure from actuating the MMU.

4. Terminals and Facilities. All terminals and facilities in the controller assembly shall conform to NEMA TS2 Type 1 and the following requirements. For double controller assemblies, two complete sets of all terminals and facilities shall be provided with all items contained in the same compartment as the associated CU.

a. Wiring and Terminations

(i) Back Panel Wiring. All wiring carrying 120 volts AC shall be discrete insulated wires and shall be soldered directly to lugs on the back of terminal blocks or sockets. All discrete wiring on the backside of the back panel shall be neatly bundled and secured with plastic cable ties.

(ii) Any multi-conductor cable shall be contained in an expandable braided sleeving.

(iii) Input/output terminals shall be configured according to the following NEMA configurations:

Specified Operation		NEMA Configuration (NEMA Table 5.3.1-1)
2 through 8 Phases		Configuration 3 (12 Load Switch Positions)
9 through 12 Phases or		Configuration 4

more than		(16 Load Switch Positions)
4 Overlaps or Ped Phases		

(iv) In addition to the minimum NEMA requirements, four pedestrian call input terminals shall be provided.

(v) If hardwire interconnection is specified, the following input/output terminals shall be provided:

Timing Plan A Output
Timing Plan B Output
Timing Plan C Output
Timing Plan D Output
Offset 1 Output
Offset 2 Output
Offset 3 Output
Timing Plan A Input
Timing Plan B Input
Timing Plan C Input
Timing Plan D Input
Offset 1 Input
Offset 2 Input
Offset 3 Input
Interconnect Common

(vi) Buss Interface Units (BIU) and BIU racks shall be provided for all required terminals and facilities.

(vii) All Port 1 cable connectors shall have positive strain relief latches such that tension on the cable will not disconnect the connector from the unit they are connected to.

b. Switches and Controls. Each controller cabinet shall be furnished with the following switches and controls. For double controller cabinets, two sets of switches and controls are provided, one set for each controller installed in each compartment.

(i) Power Interrupt Switch – A switch located inside the main cabinet shall interrupt electrical power to the controller during maintenance on the controller. Operation of this switch shall not affect the flash operation. This switch shall not be accessible via the police panel.

(ii) Flash Switches – The following switches shall place the signal on flash. Operation of these switches shall not affect the

electrical power supply to the controller. When the signals are returned to normal operation the external start shall be activated causing the controller to revert to the programmed initialization phase(s).

(1) Each controller cabinet shall be furnished with a clearly labeled flash switch mounted in the access or police panel.

(2) Each controller cabinet shall be furnished with a clearly labeled flash switch mounted on the cabinet door in the inside of the cabinet.

(iii) Stop Time Switch – A three position switch mounted inside the main cabinet shall provide the following functions:

(1) Stop Time – Causes the controller to stop time.

(2) Normal – Allows the controller to cycle all phases, but during MMU flash causes the controller to stop time.

(3) Run – Allows the controller to cycle all phases and during any flashing operation allows the controller to continue cycling all phases without displaying them on the signal heads.

(iv) Switches or relays which completely interrupt power to the signal heads other than the protective circuit breaker shall not be installed in the cabinet.

(v) If specified, a manual operation push button shall be installed in the police panel. The push button shall be wired for manual operation of the signals. The push button shall be water resistant and designed to protect the user against electrical shock and shall be supplied with a coiled cord with a nominal 6-foot (2-m) stretched length. A clearly labeled switch shall also be installed in the police panel to switch between manual or automatic operation of the controller.

c. Detector Facilities.

(i) At a minimum, one NEMA Configuration 2 detector rack shall be provided with the associated BIU. If more than 16 detector channels are specified, additional NEMA Configuration 1 or 2 detector racks and associated BIU(s) shall be provided for the required number of detectors. Each

detector channel shall be assigned to a separate detector input into the CU.

(ii) Detector loop connections shall be provided for the total number of detector channels available in the detector racks supplied as specified above.

(iii) Two terminals shall be provided for each detector as follows.

(1) Screw terminal strips mounted vertically on the left side of the cabinet approximately 6 inches (150 mm) from the bottom of the cabinet.

(2) All inductive loop detector inputs shall be protected with two 30-volt metal oxide varistors (MOV) with a 30 Joule rating. An MOV shall be connected between each field terminal and cabinet ground.

(iv) The detector rack shall be attached to the controller cabinet shelf by an easily removable attachment. Sufficient wire lengths shall be provided for access to the back of the rack. The rack shall not block the back panel or other termination panels.

(v) Unless shown differently on the controller order form, each detector field input into the card rack shall be associated with the appropriate card position as follows:

Channel	*Card Position*							
	1	2	3	4	5	6	7	8
1	Phase 1	1 or 6	6	6	3	3 or 8	8	8
2	Phase 5	5 or 2	2	2	7	7 or 4	4	4

(vi) Each detector channel shall be clearly labeled with detector number, phase and direction.

d. Power Distribution.

(i) Each assembly shall contain a separate aluminum power panel located in the lower right portion of the cabinet containing the following equipment:

(1) Main breaker – one type B circuit breaker conforming to Sec 1091 that shall interrupt power to the controller and

signals. The frame size and trip rating is shown on the traffic signal plans or designated in the contract.

(2) Auxiliary breaker – one type B circuit breaker conforming to Sec 1091 that interrupts power to cabinet lamp and receptacle. The frame size and trip rating shall be 15 amperes.

(3) One mercury contactor that controls power to the signal bus.

(4) One radio frequency interference suppresser.

(5) One AC service transient suppression device.

(6) One terminal block for AC power input.

(7) One earth ground bus terminal block.

(8) One isolated AC neutral bus terminal block.

(ii) Each controller assembly shall have a fluorescent lighting fixture.

5. Auxiliary Interfaces for Controllers. Interface panels shall be aluminum panels with deburred edges and rounded corners installed in the controller cabinet containing the required terminals and equipment. Interface panels shall be neatly laid out, neatly wired and easily accessible. For double controller cabinets, the auxiliary interface shall be located in the same compartment as the associated CU.

a. Pre-emption Interface. The preemption operation and interface shall conform to NEMA. The pre-emption interface shall include any field wire termination panels, relays or isolators, wiring and connectors required for proper operation. Each preemption field input shall be protected with a metal oxide varistor (MOV). For 120-volt inputs, a 150-volt MOV with an 80-Joule rating shall be used and for 24-volt inputs, a 30-volt MOV with a 30-Joule rating shall be used.

b. Hardwire Master and Local Coordination Interface. The coordination interface shall consist of any field wire termination panels, wiring and connectors required for proper operation. The master coordination interface shall output commands to the local controllers in the system. Local coordination interfaces shall accept command inputs from the master coordination interface.

Coordination interfaces shall be connected to one another or to a telephone interconnection unit, by a multi-conductor cable.

The coordination interface shall provide a control terminal strip for 7 or 12 wire interconnect as specified in the plans, vertically or horizontally mounted, that shall be located 6 (150 mm) to 8 (200 mm) inches above the bottom of the cabinet. Control voltages applied to the terminals are associated with the following input/output functions:

7 – Wire	12 – Wire
Neutral	Neutral
Timing Plan A (Dial 2)	Timing Plan A (Dial 2)
Timing Plan B (Dial 3)	Timing Plan B (Dial 3)
Timing Plan C (Split 2)	Timing Plan C (Split 2)
Offset 1	Timing Plan D (Split 3)
Offset 2	Offset 1
Automatic Flash	Offset 2
	Offset 3
	Automatic Flash

All command voltages applied to these terminals shall be 120 volts AC. Terminals for interconnect cable shall be fused and provided with a 150-volt metal oxide varistor (MOV) with an 80 Joule rating. Interface circuitry between this terminal strip and the controller shall be by solid state or relay logic.

c. Closed Loop System Interface. If the controller assembly will be part of a closed loop system, all components required to interface with the system shall be in accordance with the plans.

d. Dial-Up Modem Interface. This panel shall provide for interfacing of a leased, unconditioned telephone drop to a Hayes compatible modem that connects to the on-street system master or local controller as specified in the plans. The panel shall be mounted on the inside of the cabinet on the right side. A telephone network interface, such as a Siecor CAL3000 or other approved interface acceptable to the local phone company shall be attached to the aluminum panel. The telephone interface shall also include the installation of the necessary cable, connectors, etc. to connect the interface to the telephone drop provided by the local telephone company.

6. *Auxiliary Devices.* Each auxiliary unit shall be enclosed in a suitably finished metal or molded plastic case. It shall be mounted in the controller cabinet unless otherwise specified. The function of each

auxiliary unit shall be indicated by an identification plate on the case. Auxiliary equipment cases shall be ventilated. Temperature, voltage and frequency shall meet the requirements of Sec 1a unless otherwise specified.

a. External Time Switches. External time switches shall be solid state, keyboard entry and contain filtering and shielding circuitry to protect the unit's operation against electrical interference. Timing shall be based on the 60 Hz power supply frequency. Each unit shall contain a programmable automatic central daylight time compensation feature. Each unit shall contain a back-up power source to maintain time and memory functions during loss of AC power. Each unit shall provide a weekly program with at least 20 event changes per week.

b. Dial-Up Modem. The unit shall be an auto-dial, auto-answer modem. The modem shall be Hayes compatible capable of responding to the standard "Hayes command set". The modem shall be self-contained. The unit shall be powered by a nominal 120 VAC from the duplex service outlet provided in the cabinet. The modem shall be capable of operating at all standard baud rates from 300 to 56K baud over a standard dial-up, unconditioned telephone line. Installation shall include the appropriate interface cable to connect to an RJ-11 telephone jack on the telephone interface panel, the RS-232 cable from the modem to the system master, all other cabling, connectors and incidental items necessary for operation.

7. Controller Cabinets. Controller cabinets shall be cast aluminum or 0.125 inch (3.2 mm) reinforced sheet aluminum alloy and be of clean-cut design and appearance. The cabinet shall provide ample space for housing all equipment and components. Controller cabinets housing solid state controllers shall be furnished with unused cabinet space measuring 18 inches (450 mm) wide by 12 inches (300 mm) high by 12 inches (300 mm) deep. Cabinet size shall be not less than 54 inches (1350 mm) high by 38 inches (950 mm) wide by 25 inches (625 mm) deep and support a 12 or 16 position backpanel. The cabinet shall contain rigid shelves of such construction that the CU and auxiliary equipment may be withdrawn from the cabinet without breaking any electrical connections or interrupting normal controller operation.

a. A hinged door or doors shall provide complete access to the interior of the cabinet. Door holds shall be furnished which shall hold the door in an open position at least 90 degrees from the closed position. The doors shall fit against a rain tight gasket. Each door shall be provided with a cabinet lock and shall have a stamped

or raised outside designation, "Traffic Control" or other approved identification. An auxiliary door, positioned on each main cabinet door, equipped with a rain tight gasket, shall allow access to a switch panel and shall be equipped with a lock whose key will not unlock the main door. Two keys shall be furnished for each type lock used. The door hinges and pins shall be of corrosion resistant metal. Pins shall be rolled or solid rod, at least 1/8 inch (3.18 mm) in diameter, except if continuous hinges are furnished, the pins shall be continuous the full length of the hinges and shall be not less than 1/16 inch (1.59 mm) in diameter.

b. The back panel in all controller cabinets shall be hinged at the bottom to permit the top of the panel to be rotated forward and down to an angle of not less than 45 degrees with all components, including load switches, attached for maintenance purposes. The bottom of the back panel shall be not less than 6 inches (150 mm) above the bottom of the cabinet.

c. Cabinets shall have a thermostatically controlled ventilating fan with exhausting capability, in an enclosure, of at least 150 cubic feet per minute (4.25 m^3/min) for cabinets up to 30.5 cubic feet (0.86 m^3) and at least 250 cubic feet per minute (7.08 m^3/min) for cabinets 30.5 cubic feet (0.86 m^3) and more, installed in the top of the cabinet. These cabinets shall be supplied with a replaceable furnace type fiberglass filter of at least one square foot (m^2) area mounted behind louvers in the lower one fourth of the door.

d. Double controller cabinets for two controllers shall be not less than 57 inches (1425 mm) high by 74 inches (1850 mm) wide by 17 inches (425 mm) deep and shall support two 12 position back panels. All double cabinets shall have two doors that are hinged on the outside corners of the cabinet so that the doors open away from each other. Double cabinets shall have a divider between the two halves of the cabinet with an 8-inch (200-mm) opening between the compartments at the bottom of the divider for wiring between the compartments.

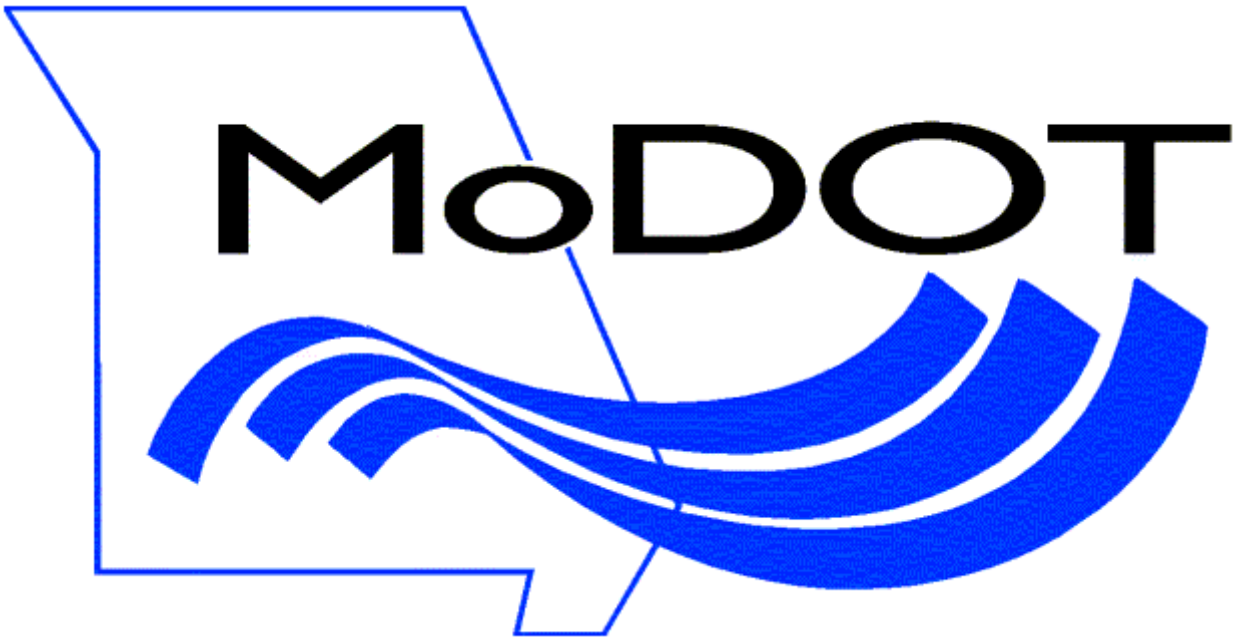
B. Induction Loop Detectors. Loop detector units shall conform to NEMA. If specified, each channel shall have extension and delay timing features as specified in NEMA. Each detector shall have a regulator for the power input. The regulator shall have the appropriate power and voltage rating for operation of the detector. Card rack detectors shall be card rack-mounted detectors as specified in NEMA unless otherwise specified on the controller order form.

6. These controllers shall be equipped with internal time base coordination using

daily midnight reference or a selectable daily reference of which midnight can be selected. All necessary components shall be furnished. Cabinet type, interconnect information and delivery locations are attached.

7. All boxes of equipment delivered for a specific intersection should be clearly marked with both the controller number and the intersection, as shown on the Delivery Schedule.

8. All controllers shall be stamped or tagged with a manufacturer's serial number.



Traffic Operations

APPROVED PRODUCTS LIST

TRAFFIC SIGNALS, HIGHWAY LIGHTING, AND HIGHWAY SIGNING EQUIPMENT

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

TRAFFIC SIGNALS AND HIGHWAY LIGHTING EQUIPMENT

I. GENERAL

This Approved Products List (APL) is based on equipment meeting department specifications and being tested for the specified test period with satisfactory performance. All models shall conform to the latest revision of the Missouri Standard Specifications for Highway Construction unless otherwise indicated. The models indicated on the list are approved, but are subject to final field inspection before acceptance.

The department frequently tests new products and equipment for traffic signals and highway lighting. These new products may be installed on a construction project, purchased on parts orders or with controller orders. Vendors may also submit items, at no cost to the department, for the test period. Only a limited number of units will be accepted for test statewide until an item is added to the Approved Products List. A vendor wishing to initiate a test on a new product shall submit a Product Evaluation Request Form - Signal and Lighting Equipment. Copies of this form can be obtained from our website at www.modot.state.mo.us or contact MoDOT Traffic Operations. Minor model changes do not require an evaluation period, although the vendor shall submit specification sheets and a sample of the product for the Department to inspect.

All equipment evaluations are coordinated through MoDOT Traffic Operations. The vendor supplying the equipment shall provide equipment specifications and a certification that the equipment meets department specifications before the test is performed. The equipment is tested for the period specified on the APL. Products that are not performing satisfactorily will be replaced with an approved product if the vendor cannot provide timely correction of the problem or if unsatisfactory operation of the intersection results.

If a vendor is proposing a product that does not meet department specifications, an explanation of why the product meets or exceeds the current specifications must be provided by the vendor in writing to Traffic Operations. If approved, the product may be tested for the specified period as described above. If the product is satisfactory, the Department will consider a revision to the applicable specifications. Products will not be added to the Approved Products List that do not meet department specifications.

Products on the APL shall continue to perform satisfactorily. In addition, the vendors shall support the products. Products not performing as required or not supported are subject to removal from the APL.

Grounds for removal of products include but are not limited to:

Significant change in product specifications or design without notification to the department.

Failure to correct or replace products that are defective in manufacturing or workmanship.

Repeated patterns of malfunctions of a product not adequately corrected by the vendor.

Unreasonable pricing of repair parts or repair work. Repair work not completed in a reasonable time frame.

Excessive delivery times for new purchases or replacement parts.

Changes in standard specifications may also necessitate removal of specific products from the APL. If this occurs, there will be a grace period where the product will be retained on the list after the specifications are changed. However the product will be removed from the list if it is not revised to meet specifications.

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

II. TRAFFIC SIGNAL EQUIPMENT

All traffic signal equipment requires a one-year evaluation period.

CONTROLLERS

NEMA TS1 CONTROLLERS	MODEL
Econolite	ASC/2-2100
Econolite	ASC/2S-2100
Econolite	ASC/3-2100
Naztec	980
Peek	3000
Siemens	EPAC Genesis M40
Siemens	EPAC M42
Siemens	EPAC M52
Traffic Control Technologies (TCT)	LMD-8000

NEMA ON-STREET MASTER CONTROLLER	MODEL
Econolite	KMC-10,000
Econolite	ASC/2M
Siemens	MARC 360

SOLID STATE PRETIMED CONTROLLERS (ALL TYPES)	MODEL
Siemens	EPIC Series
Traffic Control Technologies (TCT)	LMD 40 Series

170 CONTROLLERS	MODEL
McCain	170E
Phillips/Sisson Industries, Inc.	170E
Safetran	170E
Siemens	170E

CABINETS AND BACK PANELS (NEMA & S.S. PRETIMED)

NOTE: Cabinets and Back panels that meet MoDOT specifications from the following manufacturers will be accepted. ALL other manufacturers must provide a model that meets specifications and complete a satisfactory one-year evaluation as described above to be added to the list.

NEMA CABINET AND BACK PANEL ASSEMBLIES

Control Technology
Econolite
Henke/Bison
IDC/Gibbons
Naztec P-44
Siemens

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

SOLID STATE PRETIMED CABINET AND BACK PANEL ASSEMBLIES

Siemens

CABINETS AND RACKS (TYPE 170 CONTROLLERS)

NOTE: Cabinets and Racks that meet MoDOT specifications from the following manufacturers will be accepted. ALL other manufacturers must provide a model that meets specifications and complete a satisfactory one-year evaluation as described above to be added to the list.

332 AND 336S CABINET AND RACK ASSEMBLIES

McCain
Phillips/Sisson Industries, Inc.
Safetran

CONFLICT MONITORS

NEMA CONFLICT MONITORS	MODEL
Eberle Design Incorporated (EDI)	NSM-6
Eberle Design Incorporated (EDI)	NSM-12
Eberle Design Incorporated (EDI)	SSM-12LE
Eberle Design Incorporated (EDI)	MMU-16E
Eberle Design Incorporated (EDI)	MMU-16LE
Naztec, Incorporated	NM512
Peek/Transyt	1200
Power Distribution & Control (PDC)	CM82-03
Power Distribution & Control (PDC)	CM82-06
Power Distribution & Control (PDC)	CM82-12
Reno A&E	MMU-1600 Series
Solid State Devices	NM-6
Solid State Devices	NM-12
Solid State Devices	LCD-6P
Solid State Devices	LCD-12P
Traffic Control Technologies (TCT)	LNM Series

170 CONFLICT MONITORS	MODEL
Eberle Design Incorporated (EDI)	210E
Reno A & E	2018
Solid State Devices	210P

CABINET ACCESSORIES

AUXILIARY TIME CLOCK	MODEL
Eltec	NTC-17E
Eltec	TC-14
RTC	AP41

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

EXTERNAL T.B.C. COORDINATORS	MODEL
Eltec	TC-14

FLASHERS (NEMA & 170)	MODEL
Eberle Design Incorporated (EDI)	810
Power Distribution & Control (PDC)	SSF-86
Power Distribution & Control (PDC)	SSF-88
Reno A & E	FL-200
Traffic Sensor Corp	204
Traffic Sensor Corp	204-15
Traffic Sensor Corp	304
Traffic Sensor Corp	304-15

FLASH TRANSFER RELAYS	MODEL
AMECO	136-4962
Struthers-Dunn	21ACPX-2/21ACPXD-5
Mid-Tex	136-62T-3A1
Power Distribution & Control (PDC)	FTR 91
Reno	TR-200

LOAD SWITCHES (NEMA & 170)	MODEL
Eberle Design Incorporated (EDI)	510
Power Distribution & Control (PDC)	SSS-86
Power Distribution & Control (PDC)	SSS-88
Reno A & E	LS-200
Traffic Control Technologies (TCT)	SSS-86
Traffic Sensor Corp	200
Traffic Sensor Corp	200-15
Traffic Sensor Corp	300
Traffic Sensor Corp	300-15

ISOLATORS (170 only) (242=DC, 252=AC)	MODEL
Eberle Design Incorporated	242
GDI	242
GDI	252
Power Distribution & Control (PDC)	242
Power Distribution & Control (PDC)	252
RENO A&E	242 = DC (2 Channel)
Safetran	242
Safetran	252

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

SURGE PROTECTORS	MODEL
Emerson Network Power	Edco SHA-1250

TONE RECEIVERS	MODEL
Iniven	IR30M-05-30

TONE TRANSMITTERS	MODEL
Iniven	IT30

DETECTORS

MICROWAVE DETECTORS	MODEL
Microwave Sensors	TC-26B
Electronic Integrated Systems, Inc. (EIS)	RTMS X-2

MICROLOOP, PROBE	MODEL
3M	Canoga 701

PEDESTRIAN PUSH BUTTONS	MODEL
Campbell	4 EVR 120
Polara Engineering, Inc.	BDSP-010-B

POWER SUPPLY FOR CARD RACK DETECTORS - NEMA	MODEL
ICC	PS24
PGK	PS-1.2

SINGLE CHANNEL SHELF MOUNT DETECTORS, STANDARD	MODEL
Eberle Design Incorporated (EDI)	LMD301S
Sarasota	535B/MS

SINGLE CHANNEL SHELF MOUNT DETECTORS, TIME DELAY	MODEL
Eberle Design Incorporated (EDI)	LMD301T
Sarasota	535T/MS

ULTRASONIC DETECTORS	MODEL
Microwave Sensors	TC-30

2-CHANNEL CARD RACK COUNTING DETECTORS, DUAL OUTPUT

Eberle Design Incorporated (EDI)	LMD632

2-CHANNEL CARD RACK COUNTING DETECTORS, SINGLE OUTPUT PULSE MODE (NEMA)	**MODEL**
Eberle Design Incorporated (EDI)	LMD632T
ICC	S27B
Reno A & E	C

2-CHANNEL CARD RACK DETECTORS, STANDARD (170)	**MODEL**
Eberle Design Incorporated (EDI)	LM222
Eberle Design Incorporated (EDI)	LMD222
Reno A & E	222
Sarasota	222-GP5
Sarasota	222 GP6

2-CHANNEL CARD RACK DETECTORS, STANDARD (NEMA)	**MODEL**
Eberle Design Incorporated (EDI)	LMD602R
ICC	S27B
Reno A & E	C
Reno A & E	G

2-CHANNEL CARD RACK DETECTORS, TIME DELAY (NEMA)	**MODEL**
3M	Canoga C800 Series
Eberle Design Incorporated (EDI)	LMD602TR
Reno A & E	C
Reno A & E	GT

SIGNAL HEADS

BACKPLATES	**MODEL**
Chapel Hill	44xx Series
Intelight	BP INTLIT Series
Pelco	BK-100x Series
Neodesia Plastics	BP Series

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

HARDWARE

NOTE: Hardware that meets MoDOT specifications from the following manufacturers will be accepted. ALL other manufacturers must provide equipment that meets specifications and complete a satisfactory six-month evaluation as described above to be added to the list.

Pelco
Reliable 3/8" Strandvise 5202
Reliable ¼" Strandvise 5200

LOUVERS	**MODEL**
Pelco	GPL

POLYCARBONATE SIDE-MOUNT BRACKETS WITH RELATED HARDWARE	**MODEL**
Component Products	Any
Eagle	UKS1452AB

SIGNAL HEADS - OPTICALLY LIMITED	**MODEL**
Intelight, Inc.	ESB Series
McCain	HPTS Series

SIGNAL HEADS - POLY CONVENTIONAL	**MODEL**
Chapel Hill	SIG-TPB-305-CTN-NVN-0N (3 section)
Chapel Hill	SIG-TPB-586-CTN-NVN-0N (5 section)
Eagle	SA Series
Econolite	TP Series
General Traffic Equipment Corp	T-30 POLY
IDC/Safetrans	LT Series
McCain	MTSTP Series
Traffic Control Technologies (TCT)	PSS Series

PEDESTRIAN HEAD – POLY 1-SECTION	**MODEL**
McCain	M32258

PEDESTRIAN LED SIGNAL INDICATION	**MODEL**

Pedestrian LED signal indications must be ETL verified. The ETL verified listing is located at Intertek ETL Verified Listing - Link

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

POSTS AND MAST ARMS

Note: Posts and Mast Arms do not require an evaluation period. Posts and Mast Arms shall be fabricated in accordance with MoDOT specifications and standards. Posts and Mast Arms shall be pre-approved as required by the MoDOT standards and specifications to be added to the list. The following manufacturers have pre-approved fabrication details and documentation on file with the department. Posts and Mast Arms are subject to field inspection before acceptance.

STEEL POSTS AND MAST ARMS	DRAWING NUMBER
Ameron International	MO9811 - Rev. 9 (Type C)
Ameron International	MO9812 - Rev. 10 (Type CL)
JEM Engineering & Manufacturing	MODOT1-4 Rev. 2 (Types C, CL, B & BL)
Maico Industries, Inc.	MOMAST 1-5A Rev. 1-6 (Types C, CL, B & BL)
Millerbernd Manufacturing Company	780C388 (Type B)
Millerbernd Manufacturing Company	780C389 (Type BL)
Millerbernd Manufacturing Company	780C49 (Type C)
Millerbernd Manufacturing Company	780C51 (Type CL)
Millerbernd Manufacturing Company	500A971
Pelco Structural, LLC	MODMA1001 & 1002 (Type B)
Pelco Structural, LLC	MODMAL1001 & 1002 (Type BL)
Pelco Structural, LLC	MOSMA1001 & 1002 (Type C)
Pelco Structural, LLC	MOSMAL1001 & 1002 (Type CL)
Union Metals	30443-B202 - Rev. 19 (Types C, CL, B & BL)
Valmont	DB00408 - Rev. G (Types C, CL, B & BL)

MISCELLANEOUS

LOOP SEALANTS (Loop sealants do not require material certification)	MODEL
3M	5000
Bondo	575
Bondo	P606
Chemque	290S
Chemque	296-06
Durant Paints	Stat-A-Flex Polyseal
RAI Products	Pro-Seal 6006

PEDESTAL BASES	MODEL
Akron Foundry	TS-1000-L-P
Akron Foundry	TS-1000-L-WP
Component Products	CPI-BAS-1
Pelco	PB5336
Pelco	PB5337
Pelco	PB5340
Pelco	PB5341
Traffic Parts	TP 289 X

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

SPLICE KITS (DETECTOR LEAD-IN)	MODEL
3M	DBY Series
HOMAC HMC Industries	RAB 1/0 Series

METER SERVICE PEDESTAL (SIGNALS/SIGNALS & LIGHTING)	MODEL
Milbank 120V Signal Only	CP3B51C1PAAOMO1
Milbank 120V Signal with 2 –Circuit 240V Lighting	CP3B51C1PBAOMO2
Milbank 120V Signal with 2-Circuit 240V Lighting Dual Meter	CP3B62C2NBAOMO1
Myers 120V Signal with 2-Circuit 240V Lighting	MEUGLA-M100-MDOT
Myers 120V Signal with 2-Circuit 240V Lighting	MEUG 20
Pacific Utility Products 120V Signal Only	USP16-M2100-112C-MODOT6-TS
Pacific Utility Products 120V Signal with 2-Circuit 240V Lighting	USPA-100-100-MODOT
Pacific Utility Products 120V Signal with 2-Circuit 240V Lighting	USP16-M2100-112C-MODOT
Pacific Utility Products 120V Signal with 2-Circuit 240V Lighting	USP24-M2100-100-MODOT6-TSL
Pacific Utility Products 120V Sgnl w/2-Circuit 240V Lighting Dual Mtr	USPD-2M2100-100-MODOT6
Tesco 120V Signal with 2-Circuit 240V Lighting	28-105 Type III BF
Tesco 120V Signal with 2-Circuit 240V Lighting	28-102F

LIGHT EMITTING DIODES (LED)

LED's (circular and arrow) must be ETL verified. The ETL verified listing is located at Intertek ETL Verified Listing - Link

PROGRAMMABLE VIEW	MODEL
Dialight	P463R33003 (Red Ball)
Dialight	P463Y33003 (Yellow Ball)
Dialight	P463G33003 (Green Ball)
GELcore	DR3-RCFB-01A (Red Ball)
GELcore	DR3-YCFB-01A (Yellow Ball)
GELcore	DR3-GCFB-01A (Green Ball)

VIDEO DETECTION SYSTEMS

VIDEO DETECTOR	MODEL
Aldis	GridSmart
Econolite	Autoscope 2020
Econolite	Autoscope RackVision
Econolite	Autoscope RackVision Terra
Econolite	Autoscope Solo Terra
Iteris	Vantage Edge2
Peek Traffic Corp.	VideoTrak IQ-P
Peek Traffic Corp.	VideoTrak IQ-ITS
Traficon	VIP 3D.1
Traficon	VIP 3D.2

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

III. HIGHWAY LIGHTING

All highway lighting equipment require a one-year evaluation period except for items noted requiring a six-month evaluation.

LIGHTING POLES

Note: Poles do not require an evaluation period. Poles shall be fabricated in accordance with MoDOT specifications and standards. They shall be pre-approved as required by the MoDOT standards and specifications in order to be added to the list. The following manufacturers have pre-approved fabrication details and documentation on file with the department. Lighting poles are subject to field inspection before acceptance.

STEEL POLES	DRAWING NUMBER
Ameron International	MO98AT3 – Rev. 4 (Type AT45) Design 1 & 2
Ameron International	MO98AT2 – Rev. 4 (Type AT45)Design 3, 4 & 5
Ameron International	MO98AT4 – Rev. 3 (Type AT30)
Ameron International	MO98B2 – Rev. 3 (Type B45 & MB45)
Ameron International	MO98B4 – Rev. 2 (Type B30)
JEM Engineering and Manufacturing	MO-AT30 – Rev. 3 (Type AT30)
JEM Engineering and Manufacturing	MO-AT45 – Rev. 3 (Type AT45)
Millerbernd Manufacturing Co.	730B907 (Type AT30)
Millerbernd Manufacturing Co.	730B653 (Type AT45)
Millerbernd Manufacturing Co.	730B908 (Type B30)
Millerbernd Manufacturing Co.	730B909 (Type B45)
Millerbernd Manufacturing Co.	730B910 (Type MB45)
Union Metals	71020-B2 - Rev. 5 (Type AT30)
Union Metals	71020-B3 - Rev. 4 (Type B30)
Union Metals	71019-B6 - Rev. 7 (Type AT45)
Union Metals	71019-B7 - Rev .4 (Types B45 & MB45)
Union Metals	71019-B8 – Rev. 3 (Type B30)
Union Metals	71019-B9 – Rev. 3 (Type B45)
Union Metals	71019-B10 – Rev. 3 (Type MB45)
Union Metals	71020-B103 – Rev. 3 (Type AT30)
Union Metals	71020-B104 – Rev. 4 (Type AT45)
Valmont	DB00019 – Rev. N (Types AT30 & B30)
Valmont	DB00020 – Rev. N (Types AT45, B45 & MB45)

ALUMINUM POLES

Valmont	MO-051707 (Type AT-30)

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

FOUNDATIONS

Note: Screw anchor foundations do not require an evaluation period. Screw anchor foundations shall be fabricated in accordance with MoDOT specifications and standards. They shall be pre-approved as required by the MoDOT standards and specifications in order to be added to the list. The following manufacturers have pre-approved fabrication details and documentation on file with the department. Screw anchor foundations are subject to field inspection before acceptance.

SCREW ANCHOR FOUNDATIONS	DRAWING NUMBER
Component Products, Inc.	SLSF 8-5 (Type AT30)
Component Products, Inc.	SLSF 10-7 (Type AT45)
Hubbell Chance	SA112-0696 – Rev. G (Type AT30)
Hubbell Chance	SA112-0786 – Rev. D (Type AT45)
Integrated Traffic Solutions, Inc.	ITS AT30 (Type AT30)
Integrated Traffic Solutions, Inc.	ITS AT45 (Type AT45)
J. H. Botts	JHB MOH 30 – Rev. C (Type AT30)
J. H. Botts	JHB MOH 45 – Rev. D (Type AT45)

LUMINAIRES

NOTE: Luminaires will not be furnished with photoelectric cells. Receptacles will have a shorting plug in place of cell. Multi-tap ballast for 120 Volt and 240 Volt fixtures is permissible.

BRACKET ARM MOUNT - 150 WATT	MODEL
American Electric Lighting	115 Series
American Electric Lighting	Durastar 2000, Series 30
Crouse-Hinds/Cooper	OVZ Series
Crouse-Hinds/Cooper	OVX Series
General Electric (GE)	M2RR Series
Holophane	Mongoose Series

BRACKET ARM MOUNT - 250 WATT	MODEL
American Electric Lighting	115 Series
American Electric Lighting	Durastar 2000, Series 30
Crouse-Hinds/Cooper	OVZ Series
Crouse-Hinds/Cooper	OVX Series
General Electric (GE)	MSRL Series
Holophane	Mongoose Series

BRACKET ARM MOUNT - 400 WATT	MODEL
American Electric Lighting	125 Series
American Electric Lighting	Durastar 2000, Series 30
Crouse-Hinds/Cooper	OVX Series
General Electric (GE)	MSRL Series
Holophane	Mongoose Series

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

HIGH MAST LIGHTING	MODEL

NOTE: High mast lighting is custom designed for the location. Fixtures from the following manufacturer's series are considered pre-approved.

Cooper	HMC Series
General Electric (GE)	HMA Series
Holophane	HMAO Series
Holophane	HMS Series
Metrolux	VA Series

POLE TOP MOUNTING	MODEL
Holophane	HL2A Series
Holophane	Mongoose Series

SIGN LIGHTING - 250 WATT	MODEL
General Electric (GE)	V2FN Series
Guth	B17632 Series
Holophane	PANL Series
Holophane	SNVW Series

SIGN LIGHTING - 400 WATT	MODEL
Holophane	PANL Series
Holophane	SNVW Series

UNDERPASS (WALLPACKS)	MODEL
American Electric Lighting	582 Series
Cooper	WPK Series
General Electric (GE)	WAL Series
Holophane	MDWP Series
Holophane	WL2K Series
Hubbell	PGM-150S Series

CONTROL EQUIPMENT

CONTACTORS-ELECTROMECHANICAL	MODEL
Square D	Type S
Westinghouse/Cutler-Hammer	A202 Series

CONTACTORS-MERCURY	MODEL
Dayton/Duracool	6A/6X Series
Magnecraft	WM Series

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

BASE MOUNTED CONTROL CABINETS

NOTE: Cabinets that meet MoDOT specifications from the following manufacturers will be accepted. All other manufacturers must provide a model that meets specifications and complete a satisfactory six-month evaluation as described above to be added to the list.

Cleveland Switchboard
Coxline
Hoffman
Shallbetter
Inland Technologies

MOUNTING SOCKET FOR PHOTOELECTRIC CONTROL.....MODEL

NOTE: Mounting sockets require a six-month evaluation.

American Electric Lighting .....DUR
Fischer-Pierce.....S476-71
General Electric (GE).....MB-PECTL

PHOTOELECTRIC CONTROL	**MODEL**
Area Lighting Research	SST-120 (120 volt)
Area Lighting Research	SST-240 (240 volt)
Area Lighting Research	SST-PV (120/240 volt)
American Electric Lighting	D120-1.0-STJ (Dark to Light) (120 volt)
American Electric Lighting	D124-1.0-STJ (120/240 volt)
American Electric Lighting	D240-1.0-STJ (240 volt)
American Electric Lighting	DE480-1.0-TJ (480 volt)
Fischer-Pierce	FPN7790B (105 – 285 volt)
Fischer-Pierce	FPN7772 (195 – 305 volt)
Fischer-Pierce	FPN7794 (480 volt)
Fischer-Pierce	FPN7760 (120 volt)
General Electric (GE)	PEC01TL (>120v/< 305v w/ time delay)
General Electric (GE)	PEC1TL (120v)
General Electric (GE)	PEC5TL (480v)
ITT	SAT-15
Tyco	6190 VPS

TYPE A CIRCUIT BREAKERS	**MODEL**
Square D	FAL Series
Westinghouse/Cutler-Hammer	EHD Series (1-Pole)
Westinghouse/Cutler-Hammer	FDB Series (2-Pole)

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

MISCELLANEOUS

AVIATION LIGHTING	MODEL
Hughey & Philips	KG114

FUSED SLIP CONNECTORS	MODEL

NOTE: Slip connectors require a six-month evaluation.

Buss	HEB-JWRYC
IDEAL	30-S2212

METER SERVICE PEDESTAL (LIGHTING)	MODEL
Milbank 4-Circuit 240V Lighting	CP3B51C1PBAOMO3
Milbank 4-Circuit 480V Lighting	CP3B51D1PBAOMO1
Milbank 4-Circuit 480V Lighting (used for Ameren cold sequence)	CP3B51D1PBAOMOCS1
Pacific Utility Products 4-Circuit 240V Lighting	USP24-M2100-100-MODOT6
Pacific Utility Products 4-Circuit 480V Lighting	USP16-M2100-112C-MODOT
Pacific Utility Products 4-Circuit 480V Lighting	USP24-M2100-100-MODOT6-480

NAVIGATION LIGHTING	MODEL
Tideland	ML-140 with TF-3AC Lamp Changer
Automatic Power, Inc.	FA-143

SPLICE KITS	MODEL
3M	82A1 (Single)
3M	82A2 (Single)
3M	82B1 (Three Way)
3M	82B2 (Three Way)
HOMAC HMC Industries	RAB 1/0 Series

TRANSFORMER BASES	MODEL
Akron Foundry	TB1-17H (for AT30)
Akron Foundry	TB3-17H (for AT45)

IV. POWER SUPPLY EQUIPMENT AND PULL BOXES

All items require a six-month evaluation period.

MAIN SERVICE DISCONNECT ENCLOSURE WITH SAFETY SWITCH (NEMA 4)	MODEL
General Electric (GE)	TE 100 CS
Square D	FA-100-DS Series E2
Westinghouse	WFDN 100

PREFORMED PULL BOX-CLASS 1	MODEL
Straight	
Armorcast Products Company	A6001640TAPCX22 (Box & Lid)
Carson Industries	H1730-24 (Box)
CDR	A14-1730 series-22” (Box & Lid)
Composite Industries	CI183024PB1P
Highline	PHA173024HO1R
	H1730-PI (Lid)
Martin Enterprises	173022PC
Strongwell/Quazite	PG1730B532 (Box)
	PG1730H511 (Lid)
	PG1730BA Series
Synertech	S1730B24AA (Box)
	S1730HBB0A (Lid)
Flared	
Armorcast Products Company	A6001640TAX24 (Box & Lid)
CDR	A12-1730 series-22” (Box & Lid)
Highline	CHA173024HO1R
Martin Enterprises	1730/22 FRP
NewBasis	FCA173022CC4126-62 (Box & Lid)
NewBasis	FCA173022CC4749-61 (Box & Lid)
NewBasis	FCA173024T Series (Box & Lid)
Pencell Plastics	PEM-1830-PCX (Box & Lid)

PREFORMED PULL BOX-CLASS 2	MODEL
Straight	
Armorcast Products Company	A6001974TAPCX26 (Box & Lid)
Armorcast Products Company	A6001974TAPCX24
Carson Industries	H2436-24 (Box)
	H2436-PI (Lid)
CDR	A14-2436 series-24” (Box & Lid)
Composite Industries	CI243624PB1P
Highline	PHA243624HO1R
Martin Enterprises	243624PC
Strongwell/Quazite	PG2436B539 (Box)
	PG2436H508 (Lid)
	PG2436BA Series
Synertech	S2436B26AA (Box)
	S2436HCB0A (Lid)

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

PREFORMED PULL BOX-CLASS 2	MODEL
Flared	
Armorcast Products Company	A6001974TAX26 (Box & Lid)
Armorcast Products Company	A6001974TAX24
CDR	A12-2436 series-24” (Box & Lid)
Highline	CHA243624HO1R
Martin Enterprises	2436/24 FRP
NewBasis	FCA243630CC4126-61 (Box & Lid)
NewBasis	FCA243630CC4749-61 (Box & Lid)
NewBasis	FCA243624T Series (Box & Lid)
Pencell Plastics	PEM-2436-36 (Box & Lid)
Pencell Plastics	PEM-2436-PCX-24 (Box & Lid)
Synertech	S2436B24AA (Box)
	S2436HCB0A (Lid)

PREFORMED PULL BOX-CLASS 3	MODEL
Straight	
Armorcast Products Company	A6001430TAPCX36 (Box & Lid)
Carson Industries	H3048-36 (Box)
	H3048-P1 (Lid)
CDR	A14-3048 series-36” (Box & Lid)
Composite Industries	CI304836PB1P
Highline	PHA304836HO1R
Martin Enterprises	304836PC
Strongwell/Quazite	PG3048B560 (Box)
	PG3048H517 (Lid)
	PG3048BA Series
Synertech	S3048B36AA (Box)
	S3048HCB0A (Lid)
Flared	
Armorcast Products Company	A6001550TAX36 (Box & Lid)
CDR	A12-3048-series 36” (Box & Lid)
Highline	CHA304836HO1R
Martin Enterprises	3048/36 FRP
NewBasis	FCA304836EE4749-61 (Box & Lid)
NewBasis	FCA304836T Series (Box & Lid)
Pencell Plastics	PEM-3048-36-PCX-SPLIT (Box & Lid)

PREFORMED PULL BOX-CLASS 5	MODEL
Flared	
Armorcast Products Company	A6001466TA (Box & Lid)
Armorcast Products Company	A6000172TAX36 (Box & Lid)
CDR	A12-3200 series-36” (Box & Lid)
Highline Products	CRA3236H01
Martin Enterprises	320036 FRP
NewBasis	FCA320036T Series
NewBasis	FCA540036C4800 (Box & Lid)
NewBasis	FCA540036C40336 (Box & Lid)
NewBasis	FCA540036-MODOT
Quazite	PR3944Z504

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

HIGHWAY SIGNING EQUIPMENT

V. GENERAL

This Approved Products List (APL) for highway signing equipment contains current pre-approved products for highway signing. This list is applicable to department purchases and construction contracts. The list includes products that have been approved for use based on satisfactory performance during a specified test period. Products listed have undergone sufficient field testing to be considered acceptable for use at any time. All field tests of new products or pending products should be arranged with Central Office Traffic.

The department frequently tests new products and equipment for highway signing. These new products may be installed on a construction project or used for normal department installations and maintenance. Vendors may also submit items, at no cost to the department, for the test period. Only a limited number of units will be accepted for test statewide until the product is added to the Approved Products List. A vendor wishing to initiate a test on a new product shall submit a Product Evaluation Request Form. Copies of this form can be obtained from our website at www.modot.state.mo.us or contact MoDOT Central Office Traffic. Minor model changes of previously approved products do not require a new evaluation period, although the vendor shall submit specification sheets and a sample of the product for the Department to inspect. Any modifications determined to potentially alter the performance of the product may require the product to undergo additional field testing and evaluation.

All product evaluations are coordinated through MoDOT Central Office Traffic. The vendor supplying the equipment shall provide equipment specifications and a certification that the equipment meets department specifications before the test is performed. The equipment is tested for the period specified by Central Office Traffic (typically one year). Products that are not performing satisfactorily will be left off of the list. Products that were previously approved that begin to perform unsatisfactorily will be removed or replaced with an approved product if the vendor cannot provide timely correction of the problem.

If a vendor is proposing a product that does not meet department specifications, an explanation of why the product meets or exceeds the current specifications must be provided by the vendor in writing to Central Office Traffic. If approved, the product may be tested for the specified period as described above. If the product is satisfactory, the Department will consider a revision to the applicable specifications. Products will not be added to the Approved Products List that does not meet department specifications.

Products on the APL shall continue to perform satisfactorily. In addition, the vendors shall support the products. Products not performing as required or not supported are subject to removal from the APL.

Grounds for removal of products include but are not limited to:

- Significant change in product specifications or design without notification to the department.
- Failure to correct or replace products that are defective in manufacturing or workmanship.
- Repeated patterns of malfunctions of a product not adequately corrected by the vendor.
- Unreasonable pricing of repair parts or repair work. Repair work not completed in a reasonable time frame.
- Excessive delivery times for new purchases or replacement parts.

Changes in standard specifications may also necessitate removal of specific products from the APL. If this occurs, there will be a grace period where the product will be retained on the list after the specifications are changed. However the product will eventually be removed from the list if it is not revised to meet specifications.

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

VI. HIGWAY SIGNING EQUIPMENT

BREAKAWAY DEVICES

MANUFACTURER	DESCRIPTION, MODEL
Ultimate Highway Products	Triangular Slip Base for 2.5” PSST, Slip-Mate
Xcessories Squared	Kleen Break 425 for 2” PSST, XKB42520-G
Xcessories Squared	Redi-Torque 280 for 2.5” PSST, SB8C-250A-G
Xcessories Squared	Redi-Torque Bolt Kit, RTSB-MPHDW
Northwest Pipe Company	S-Q 8” Square Slipbase for 2.5” PSST, 31209
Designovations, Inc	Snap n Safe S250 and S250 S
Dent Breakaway Industries, Inc	3/4” Dent Bolt, #6882
Dent Breakaway Industries, Inc	5/8” Dent Bolt, #6878
Dent Breakaway Industries, Inc	1/2” Dent Bolt, #6874
Dent Breakaway Industries, Inc	5/8” Ground Anchors (Galvanized)
Dent Breakaway Industries, Inc	5/8” Modified Dent Bolt, #6220
Dent Breakaway Industries, Inc	3/4" Modified Dent Bolt, #6882

FOUNDATIONS/ANCHORS

MANUFACTURER	DESCRIPTION, MODEL
None	None

SIGN HARDWARE

MANUFACTURER	DESCRIPTION, MODEL
Xcessories Squared	Aluminum Post Clamp for 2.5” Pipe, XAPC278RD
Xcessories Squared	Aluminum Post Clamp for 3” Pipe, XAPC350RD
Xcessories Squared	Aluminum Post Clamp for 4” Pipe, XAPC450RD
Xcessories Squared	Aluminum Bar for Post Clamps, XAB750
Xcessories Squared	Aluminum Sign Backer Bar, ASB200P1
Xcessories Squared	Extruded Panel Clamp for 2” PSST, EPPCS200SQ
Xcessories Squared	Extruded Panel Clamp for 2.5” PSST, EPPCS250SQ
Xcessories Squared	Extruded Panel Clamp for 2.5” Pipe, EPPCS250RD
Xcessories Squared	Extruded Panel Clamp for 3” Pipe, EPPCS300RD
Xcessories Squared	Extruded Panel Clamp for 4” Pipe, EPPCS400RD
Xcessories Squared	Extruded Panel Clamp for 4x4 Wood, EPPCS44W
Xcessories Squared	Extruded Panel Clamp for 4x6 Wood, EPPCS46W
Xcessories Squared	Extruded Panel Clamp for 6x6 Wood, EPPCS66W

SIGNS

MANUFACTURER	DESCRIPTION, MODEL
Tapco	Blinkersigns

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

ADDED:

ISOLATORS (170 only) (242=DC, 252=AC)	**MODEL**
RENO A&E	242 – DC (2 Channel)

VIDEO DETECTION SYSTEMS	**MODEL**
VIDEO DETECTOR	
Aldis	GridSmart
Peek Traffic Corp	VideoTrak IQ-P
Peek Traffic Corp	VideoTrak IQ-ITS

FUSED SLIP CONNECTORS	**MODEL**
IDEAL	30-S2212

PERFORMED PULL BOX-CLASS 1	**MODEL**
Flared	
Martin Enterprises	1730/22 FRP

PERFORMED PULL BOX-CLASS 2	**MODEL**
Flared	
Martin Enterprises	2436/24 FRP

PERFORMED PULL BOX-CLASS 3	**MODEL**
Flared	
Martin Enterprises	3048/36 FRP

PREFORMED PULL BOX-CLASS 5	**MODEL**
Flared	
Martin Enterprises	320036 FRP

DELETED:

LOOP SEALANTS	**MODEL**
Bondo	560

SURGE PROTECTORS	**MODEL**
Emerson Network Power	SHA 1210

MISSOURI DEPARTMENT OF TRANSPORTATION
APPROVED PRODUCTS LIST

REVISED:

MOUNTING SOCKET FOR PHOTOELECTRIC CONTROL .....MODEL

NOTE: Mounting sockets require a six-month evaluation.

American Electric Lighting .....PBC
Changed to *(April 2013)*
American Electric Lighting .....DUR

SURGE PROTECTORS **MODEL**
Emerson Network Power 1250
Changed to
Emerson Network Power .....Edco SHA-1250

STEEL POSTS AND MAST ARMS
Valmont.....DB00408 – Rev. C (Types C, CL, B & BL)
Changed to
Valmont.....DB00408 – Rev. G (Types C, CL, B & BL)