Green Sheet Qualification/Specification Information

October 4, 2022

Oregon Department of Transportation

Technical Services

Traffic-Roadway Section

Traffic Standards Unit

Contents

Product Evaluation

This list contains the standards for all Green Sheets products. It is intended to be used by:

- The manufacturer/supplier when submitting a product to ODOT for evaluation for use on future projects
- The contractor when submitting a write-in product on the Green Sheets for evaluation for immediate use on a project under contract

Standards may be modified, added, or deleted at any time, so it is important to always download the most current copy from the website each time.

Product Evaluation for Immediate Use (Contractor Write-in Request)

The Contractor will submit the required documents as stated in the "To Request TRS Evaluation" listed for each product in this document if allowed. The majority of green sheet items do not allow write-in products for projects under contract due to testing requirement timelines and will be clearly marked as such (only prequalified products already listed on the green sheets will be approved for use for projects under contract).

Note that write-in requests:

- may be added to the Green Sheets for future use at the Traffic Standards Section (TRS) discretion

Product Evaluation for Future Use (Manufacturer/Supplier Request)

Product evaluation requests fall into two classes:

- EQUAL: products similar to products that are currently used by the Oregon Department of Transportation (ODOT) and have required standards listed in the Green Sheets. The Manufacturer/Supplier will submit the required documents as stated in the "To Request TRS Evaluation"
- NEW: products not addressed by current specifications or standards. The Manufacturer/Supplier will submit the all relevant documentation on product.

Typically a Manufacturer's product data sheet (cut sheet) showing compliance with the standards and a sample for physical/operational/environmental testing is required. Timelines for the physical/operational/environmental testing will vary depending on the item and staffing resources, but will typically be accomplished within 6 months of submittal. Additional information may be also requested, such as independent test results, installation instructions, samples, Material Safety Data Sheets, etc.

Products will be evaluated by ODOT Traffic Engineers, Traffic Signal Technicians, and Electricians. The Manufacturer/Supplier will be notified of the final product status.

Product Status

1. **Qualified:** Product meets all applicable standards and is placed on the Green Sheets

2. **Trial Use Only:** products will be allowed a trial installation on one project only, recommended for a demonstration project, or recommended as an experimental feature. They will be monitored during installation and for a limited performance period. The Traffic Standards Section (TRS) will locate an active or future ODOT project which will incorporate the product. This will typically be accomplished within one year of notice of "trial use only" status.

3. **Rejected:** product does not meet standards, has failed performance testing, or the requested product information is not provided within three (3) months of the request

Unsatisfactory Performance, at any time, will result in rejection of a product and removal from the Green Sheets.

Controller Cabinet & Equipment (Chamber Tested)

Controller Cabinet

Standard (Five Categories):	
332S 332 334 336 336S	• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above (Includes cabinet prints, wiring diagrams, scale drawings, etc.) • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.	

Controller

Standard (Three Categories):	
2070 Controller 1B	• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata for the 2070 versions.
2070 Controller 1E	• Conform to ODOT price agreement specifications for the ATC version. Contact state traffic signal engineer for copy.
ATC Controller (typically ODOT furnished)	
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.	

Conflict Monitor

Standard:
• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Load Switch

Standard:
• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:
• Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Flasher

Standard:
• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:
• Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Detector Amplifier

Standard:
• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:
• Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Isolator (DC and AC)

Standard (Three Categories):	
DC Isolator - 242	• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
AC Isolator - 252	
AC Isolator - 255	
To Request TRS Evaluation:	
• Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.	

Relay (FTR) Generic Model 430

Standard:
• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:
• Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Preeemption Interface

Standard:
• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Preemption Detector (Field Device)

Standard (Two Categories):	
Standard Optical	• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
GPS	
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for performance testing	

GPS Time Sync Module

Standard:
• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Controller Cabinet & Equipment (Non-Chamber Tested)

Battery Backup Systems

Standard (Two Categories):	
Stand-alone Systems **332 & 332S Integrated Systems**	• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for performance testing	

Communications Bracket

Standard (Two Categories):	
Copper Interconnect **Fiber Optic Interconnect**	• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata (Appendix B).
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for performance testing	

Fiber Optic Connection Patch Panel

Standard:
• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
To Request TRS Evaluation:
• Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for performance testing

Video/Radar/Hybrid Detection Systems (Chamber tested)

Video Detection Systems

Standard:
- System includes both field devices and necessary controller cabinet equipment.   - Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.   - Shall integrate with Q-free ATC controller running Q-Free MaxTime software
To Request TRS Evaluation:
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract):   - Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above.   - Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Hybrid Video/Radar Detection Systems

Standard:
- System includes both field devices and necessary controller cabinet equipment.   - Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.   - Shall integrate with Q-free ATC controller running Q-Free MaxTime software
To Request TRS Evaluation:
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract):   - Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above.   - Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Radar Detection Systems

Standard (Three Categories):	
Near Range	• System includes both field devices and necessary controller cabinet equipment.
Far Range	• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.
Side Fire	• Shall integrate with Q-free ATC controller running Q-Free MaxTime software

To Request TRS Evaluation:
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for physical, operational, and environmental testing as per the ODOT Standard Specification For Microcomputer Signal Controller, including published errata.

Field Devices (Non-Chamber Tested)

Audible Pedestrian Signal

Standard:	
Traffic Signal	• Shall be capable of using tones and programmable voice messages • Shall have a locator tone • Shall have a vibro-tactile arrow located on the pushbutton • Shall be capable of adjusting volume based on ambient noise • Shall comply with the MUTCD • Control system will be within the button mount or pedestrian signal head, not the controller cabinet.
RRFB	• Meet all requirements shown above for "Traffic Signal" audible pedestrian signal. • Shall be compatible with "**Rectangular Rapid Flashing Beacon (RRFB) Assembly**"
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for performance testing	

Beacon Assemblies (Non-chamber tested)

24/7 Flashing Beacon Assembly

Standard (Three Categories):	
Yellow	- Shall be capable of operating 24 hours a day, 7 days a week. - Shall be weatherproof and fully operational between -20° F to 130° F and in humidity range of 0% to 100% non-condensing - Shall have the capability to be powered using 12VDC for battery/solar power or 120V AC. - Have a 12" circular yellow beacon meeting the requirements of TM460 - Control system that activates the flashing beacon 24/7 - Shall comply with the MUTCD - Meet requirements for mounting shown in DET44670, DET4681, or DET4450
Yellow + Speed Feedback	- Shall be capable of operating 24 hours a day, 7 days a week. - Shall be weatherproof and fully operational between -20° F to 130° F and in humidity range of 0% to 100% non-condensing - Shall have the capability to be powered using 12VDC for battery/solar power or 120V AC. - Have a 12" circular yellow beacon meeting the requirements of TM460 - Control system that activates the flashing beacon 24/7 - Shall comply with the MUTCD - Meet requirements for mounting shown in DET4451 - Speed feedback sign to meet requirements stated for "Unintegrated Speed Feedback Assembly" - One control system to activate both the flashing beacon and the speed feedback sign.
Red	- Shall be capable of operating 24 hours a day, 7 days a week. - Shall be weatherproof and fully operational between -20° F to 130° F and in humidity range of 0% to 100% non-condensing - Shall have the capability to be powered using 12VDC for battery/solar power or 120V AC. - Have a 12" circular red beacon meeting the requirements of TM460 - Control system that activates the flashing beacon 24/7 - Shall comply with the MUTCD - Meet requirements for mounting shown in DET44670, DET4681, or DET4452
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): - Manufacturer's product data sheet (cut-sheet) showing compliance with standards listed above - Sample of product for performance testing	

Actuated Flashing Beacon Assembly

Standard (Five Categories):	
Ped/Bike	• Shall be capable of operating 24 hours a day, 7 days a week. • Shall be weatherproof and fully operational between -20° F to 130° F and in humidity range of 0% to 100% non-condensing • Shall have the capability to be powered using 12VDC for battery/solar power or 120V AC. • Have a 12" circular yellow beacon meeting the requirements of TM460 • Control system that activates the flashing beacon upon actuation of a pushbutton, for a programmable amount of time • Shall comply with the MUTCD • Meet requirements for mounting shown in DET4453
EV	**Place holder for now**
School	• Shall be capable of operating 24 hours a day, 7 days a week. • Shall be weatherproof and fully operational between -20° F to 130° F and in humidity range of 0% to 100% non-condensing • Shall have the capability to be powered using 12VDC for battery/solar power or 120V AC. • Have a 12" circular yellow beacon meeting the requirements of TM460 • Control system that actives the flashing beacon via time of day/day of week programing, for a programmable amount of time. • Shall comply with the MUTCD • Meet requirements for mounting shown in DET4454
School + Speed Feedback (small) School + Speed Feedback (large)	• Meet all applicable requirements shown above for "School" actuated flashing beacon assembly. • Speed feedback sign to meet requirements stated for "Unintegrated Speed Feedback Assembly" for the small or large sign size. • One control system to activate both the flashing beacon and the speed feedback sign. • Meet requirements for mounting shown in DET4455
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheet (cut-sheet) showing compliance with standards listed above • Sample of product for performance testing	

Rectangular Rapid Flashing Beacon (RRFB) Assembly

Standard:
- Shall be capable of operating 24 hours a day, 7 days a week.   - Shall be weatherproof and fully operational between -20° F to 130° F and in humidity range of 0% to 100% non-condensing   - Shall have the capability to be powered using 12VDC for battery/solar power or 120V AC.   - Shall meet the requirements of FHWA interim approval and MUTCD.   - Flash only upon actuation of a pushbutton, for a programmable amount of time.   - Meet requirements for mounting shown in TM493
To Request TRS Evaluation:
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract):   - Manufacturer's product data sheet (cut-sheet) showing compliance with standards listed above   - Sample of product for performance testing

Unintegrated Speed Feedback Assembly

Standard (Two Categories):	

Small (<45 mph)	**General**
	• Strobes or Flashing Lights are not allowed. If strobes or flashing lights are present, Owner's/User's Manual shall provide directions on disabling them.
	• Shall be capable of operating 24 hours a day, 7 days a week.
	• Shall comply with the MUTCD.
	• Shall be weatherproof and fully operational between -20° F to 130° F and in humidity range of 0% to 100% non-condensing.
	• Shall be mountable to 4" diameter pipe (4 ½" O.D).
	• Shall have the capability to be powered using 12VDC for battery/solar power or 120V AC.
	
	Radar and Programming
	• Shall monitor advancing vehicle speed via radar.
	• The radar shall have an accuracy of ± 1 mph.
	• The radar shall be a K band, single direction Doppler radar, and FCC part 15 compliant. No license shall be required.
	• Shall be programmable with the posted speed limit and threshold maximum speed (15 mph over the posted speed limit) and operate as follows:
	    ○ When no speed is detected the dynamic display shall be blank.
	    ○ When a speed less than or equal to the threshold maximum speed is detected the dynamic display shall display the speed.
	    ○ When a speed above the threshold maximum speed is detected, the dynamic display shall be blank or display "SLOW DOWN".

Large (≥45 mph)	**Dynamic Components** • The housing for the dynamic components shall be a minimum NEMA 3R rated. • The display shall include a 2 digit LEDs legend that does not flash. Smiley faces, messages other than "SLOW DOWN", or other graphics are not allowed. If other graphics or flashing options are present, Owner's/User's Manual shall provide directions on disabling these features. • The pitch of the pixels shall be 26 mm or less. • The display background shall be an opaque black. • The display shall adjust automatically for ambient or operational light conditions. • The illuminated display color shall be yellow or amber LEDs. The LEDs shall have a wavelength between 580-596 nm (nanometer). • Secondary LED displays are not allowed. **Static Sign part of the Speed Feedback sign** • The sign shall be available in black on yellow and black on fluorescent yellow. • The retroreflective sheeting shall be listed on ODOT's Signing Approved/Qualified Products List for Sheeting Materials. • The substrate shall be aluminum and shall meet ODOT Specifications 02910. • The sign shall be rectangular in shape. • The YOUR SPEED font shall be C Series, D Series, or E Series Highway Font. Fonts defined in FHWA's Standard Highway Signs and Markings documents.
CONTINUED ON NEXT PAGE	

Drawing:

Small　　　　　　Large

Sign Size	Dynamic Numeric Min. Character Height	Static Numeric Min. Character Height
Small	12 inches	4 inches
Large	18 inches	6 inches

To Request TRS Evaluation:

Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract):

- Manufacturer's product data sheet (cut-sheet) showing compliance with standards listed above
- Sample of product for performance testing

ITS Projects Only (Non-Chamber tested)

ITS Cabinet & Subassemblies

Standard (Two Categories):	
340 Cabinet, 4-door (Ground Mounted)	• Conform to most current version of the ODOT Standard Specification For Microcomputer Signal Controller, including published errata. • Conform to ITS special provisions.
342 Cabinet, 2 door (Ground Mounted)	
346 Cabinet, (Pole Mounted)	
To Request TRS Evaluation:	
Note: Due to testing requirement timelines, no write-in products are allowed for projects under contract – only prequalified products already listed on the green sheets will be approved for use for projects under contract): • Manufacturer's product data sheets (cut-sheets) showing compliance with standards listed above. • Sample of product for performance testing	