



# The Florida Senate

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Committee on Transportation

Senator James "Jim" Hargrett, Chairman

## EVALUATION AND SELECTION OF PRODUCTS FOR THE DEPARTMENT OF TRANSPORTATION'S QUALIFIED PRODUCTS LIST

### SUMMARY

The Qualified Products List (QPL) provides assurance to contractors, consultants, and department personnel that the products and materials included therein meet the appropriate construction specifications and are approved for use on department projects. The QPL review process involves a combination of laboratory and field testing designed to evaluate the product relative to the compositional and performance criteria contained in the department's specifications. Generally, products appearing on the QPL are manufactured items with standardized applications (paints, reflective sheeting, pavement markers, etc.)

During the course of this review the committee received a number of comments from manufacturers, suppliers, and contractors relative to the QPL program. These comments were generally mixed, reflecting both praise and criticism for the current QPL program. Most of the complaints were related to the issues of fairness, consistency, and efficiency.

Comparison of Florida's QPL program with similar product evaluation programs revealed that the department's procedures and program requirements are generally reasonable and comparable to procedures used in other states. As in Florida, much of the concern in other states relative to product evaluation centers on new products where there are no existing specifications.

We identified several opportunities for improving the QPL program. Recommended actions include the following: increased acceptance of national product evaluation and testing standards; improved access to program procedures and testing methods; and the creation of a joint department/industry committee to oversee the development of performance-related specifications.

### BACKGROUND

The Florida Department of Transportation (FDOT) and its contractual partners use thousands of different products and materials in the construction and maintenance of the state's transportation system. These products and materials represent millions of dollars in expenditures annually. Public safety and the wise investment of public funds dictate that the department ensure that products and materials utilized in the construction of roads and bridges meet minimum standards. To assure the integrity of construction materials, the department has established specifications which describe qualitative characteristics and acceptance criteria. Certain categories of products and materials which have been evaluated and approved as complying with the specifications are included on the department's Qualified Products List.

Section 334.044, Florida Statutes, provides that the department is to develop and adopt uniform minimum standards and criteria for the design, construction, maintenance, and operation of public roads. Requirements relating to the evaluation and selection of products for inclusion on the Qualified Products List are not specifically addressed in statute. Rather, these requirements are established in the department's policies, procedures, and standards.

### Standard Specifications

The department's *Standard Specifications for Road and Bridge Construction* establish general requirements governing the work performed, as well as the quantities and qualities of materials used in FDOT projects. The Standard Specifications are included, along with the construction plans, supplemental specifications, special provisions, and supplementary documents, as a part of the contract document which constitutes the legally binding agreement between the department and

contractor setting forth the obligations of each party.

The Standard Specifications are composed of three divisions: (I) general contract requirements and covenants; (II) construction details; and (III) materials. Division II (construction details) describes the general construction procedures that contractors must adhere to in the execution of work. Division III (materials) establishes minimum requirements (including testing standards) for substances used in construction projects. Contractors are required to only use materials that meet the requirements of the applicable specifications, and that have been approved by the appropriate FDOT engineer.

Methods of sampling and testing materials are in accordance with FDOT procedures and applicable testing standards. Testing standards are prescribed by the American Association of State Highway and Transportation Officials (AASHTO), the American Society for Testing Materials (ASTM), the Florida Test Methods or other appropriate testing standard. In addition, the department has adopted procedures that establish approval and production control requirements for certain types of materials which have site or design specific characteristics. For example, the department only accepts mineral aggregates (asphalt, concrete, etc.) that are produced under a FDOT-approved Producer Quality Control Program. The department retains the authority to inspect or test products and materials at any time.

*Other Specifications* - In addition to the Standard Specifications, the department has several categories of specifications that are unique to each project. As with the Standard Specifications, these specifications are considered part of the contract document. Identified below are examples of other categories of specifications.

- Supplemental Specifications: additions and revisions to the Standard Specifications;
- Developmental Specification: a specification developed around a new process, procedure, or material;
- Special Provisions: specific clauses adding to or revising the Standard Specifications, setting forth conditions varying from or additional to the Standard Specifications for a specific project;
- Supplemental Special Provisions: additions and revisions to the contract documents issued prior to bid opening; and
- Technical Special Provisions: Specifications prepared by a registered engineer other than the State Specifications Engineer or his designee, that are made part of the contract as an attachment to the contract documents.

### **The Qualified Products List**

The Qualified Products List (QPL) provides assurance to contractors, consultants, designers, and FDOT personnel that the products and materials which appear therein meet the appropriate specifications and are approved for use on department projects. Generally, products appearing on the QPL are manufactured items with standardized applications. Products which appear on the QPL are considered to have basic approval but may be subject to additional testing of individual lots or shipments as provided in the relevant specifications. The department limits contractor procurement and use of products and materials that require pre-approval in specifications to those items listed in the QPL. Florida cities and counties also use the QPL as an important product procurement resource.

*The QPL Review and Approval Process* - Responsibility for management of the QPL is assigned to the Product Evaluation Section in the Office of Design. Manufacturers are required to submit a product evaluation application with a certified test report from an independent test laboratory which indicates that the material meets all applicable specifications. If the product is not covered by an existing FDOT specification, the manufacturer must submit proposed specifications and certified test reports with the application (see below). The Product Evaluation Administrator forwards the application and any test data to the State Materials Office or other appropriate office for evaluation in accordance with the requirements of the appropriate specification.

*Removal from the Qualified Products List* - The Product Evaluation Administrator is responsible for reviewing recommendations by FDOT personnel to remove a product from the QPL due to non-compliance with specifications. The department's procedures state that any product experiencing two or more laboratory or field failures within a 12 month period will be considered in non-compliance with applicable

specifications and subject to removal from the QPL for a minimum period of one year.

*Profile of the Qualified Products List* - Currently, there are 1,550 products listed in the QPL. These products are broken down into 19 categories, based on application. Examples of these functional categories include: maintenance of traffic; reflective pavement markers; epoxy compounds; and safety devices. During fiscal year 1997-98, 291 products were submitted to the Product Evaluation Administrator for review. During this same time period 34 products were approved for inclusion on the QPL, and 15 products were rejected. The remaining 242 products are still in review or inactive. According to FDOT administrators, the only reason for rejecting a product is non-conformance with specifications.

### **Review and Evaluation of Products Not Covered by Specification**

The Product Evaluation Administrator is responsible for coordinating a preliminary review of new products not covered by an existing specification. This initial review examines the product as it relates to use, performance claims, field installation requirements, and other considerations. If the product is not recommended for further consideration the manufacturer is issued written notification.

If the department recommends further testing in actual highway usage, the Product Evaluation Administrator will request a detailed plan of research and evaluation from a department sponsor on a particular FDOT project. The work plan must identify specifications to be used for the product, the proposed application for the product, a plan for gathering evaluation data from the project, and a schedule for formalizing an evaluation report summarizing the findings. Proprietary specifications developed by the manufacturer may be used in evaluation of the product only if approved as part of the work plan.

If the field testing supports a finding that the product has potential for future use on FDOT projects, the Product Evaluation Administrator and the State Specifications Office will develop an appropriate non-proprietary specification. Based on the overall findings of the previous testing, acceptance criteria and supporting data, the Product Evaluation Administrator will then submit a recommendation for approval of the product for inclusion on the QPL.

## **METHODOLOGY**

In order to identify opportunities for improving FDOT's evaluation and selection of products, Senate staff conducted interviews with department officials, product and materials representatives, and other interested parties. In addition, committee staff reviewed related documents prepared by the department, the American Association of State Highway and Transportation Officials, the Transportation Research Board, the Federal Highway Administration and other sources. Staff also interviewed transportation officials in ten other states in order to ascertain product and material evaluation requirements in other states.

## **FINDINGS**

A number of parties have approached the Legislature in recent years with concerns relating to FDOT's product evaluation and selection procedures, including the QPL. In evaluating these concerns and the overall operation of the QPL program, we looked to the experiences of other states and national transportation product evaluation entities. Our research suggest that while the department's current product evaluation and testing procedures are generally reasonable and comparable to procedures used in other states, there are opportunities for continued improvement.

### **Complaints and the Department's Response**

*Manufacturer and Vendor Complaints* - During the past two years, the Senate Transportation Committee has received several complaints relative to the QPL and the department's administration of the QPL. Following the initiation of this interim project, the committee solicited comments from all interested groups. While a handful of parties came forward with additional concerns, the committee also received a number letters from product manufacturers and contractors indicating support for the current QPL policies and procedures. We noted that the majority of the complaints originated from firms engaged in the manufacture and marketing of traffic safety and traffic control products.

Rather than evaluate the relative merits of the individual complaints, we reviewed the submitted complaints in order to identify those issues which have program-wide implications. Based on our review, we identified the following major concerns:

- The QPL evaluation process is too time consuming;
- The department is sometimes arbitrary in the selection of product testing methods (Florida Test Methods, ASTM, AASHTO, etc.);
- There is a lack of readily available information on the QPL and the corresponding testing procedures;
- The department does not do enough to safeguard against sole sourcing products; and
- There are opportunities for department or contractor bias to influence the outcome of product evaluation.

*The Department's Response* - At the request of this committee, the department provided a written response to each of the concerns previously identified. The department's response is summarized below.

Time to Qualify - The department does not maintain statistics on the length of time required to complete the QPL review process. According to FDOT, the time required to complete the evaluation varies according to the product and the corresponding field testing. Many products must undergo field testing for a minimum of six months to one year.

Selection of Testing Methods - The department stated that the Florida Test Methods are based on national specifications and test methods promulgated by ASTM and AASHTO. This allows manufacturers to develop materials and products that are generic and not manufacturer specific. According to FDOT managers, the Florida Test Methods are specified where national standards are perceived to be deficient. For example, in recognition of Florida's climate, the Florida Test Methods contain more stringent ultraviolet requirements.

Lack of Readily Available Information on QPL - The department asserts that the specifications and procedures governing product evaluation are very specific with respect to the information required and the testing requirements. The department further states that the Florida Test Methods are detailed regarding how the test is performed and the duration of the test period. These documents are available to the public upon request.

Sole Sourcing of Products - The department claims that it is very sensitive to the issue of sole sourced items and makes every effort to avoid specifications that could result in only one item appearing in the QPL. However, the department contends that it has a responsibility not to sacrifice quality and safety in the name of competition.

Bias in Testing - The department maintains that it attempts to minimize bias and ensure consistency by basing its testing procedures on national specifications and testing standards. To further reduce the opportunity for bias, the department requires the manufacturer to assume responsibility for independent testing and the installation of their products on test platforms (where applicable).

### **National Perspective on Product Evaluation**

Interviews with representatives of transportation agencies in other states revealed that most states employ similar approaches to product testing and evaluation. However, there is wide variation among the states in terms of the specific testing criteria. Efforts to standardize and coordinate product testing and evaluation procedures among the various states have met with limited success. As in Florida, much of the concern in other states relative to product testing and evaluation centers on new products where there are no existing specifications.

*Differing Evaluation Standards* - Transportation agencies in each state are responsible for adopting road and bridge specifications to guide contractors in the execution of their work. Similarly, states generally maintain an approved or qualified products list that contains a listing of products which have been subjected to prescribed laboratory and field testing. This testing is designed to evaluate the composition and performance of the product under the particular geologic and climatic conditions of that state. In addition to testing methods established by national organizations such as AASHTO and ASTM, most states have developed customized test methods similar to those contained in the Florida Test Methods.

While product evaluation procedures are generally similar, there is considerable variation in the methods of testing used by states. Field testing requirements for retroreflective pavement markers provide an example of how testing criteria vary from state to state. In addition to laboratory testing carried out in conformance with ASTM specifications, FDOT uses a six month field

performance test on roads of 17,000 to 20,000 average daily traffic. In comparison, markers in California are subjected to a one year field test on roads of 200,000 to 250,000 average daily traffic. In Georgia, markers are subjected to a two year field test on roads of 50,000 to 60,000 average daily traffic. Some states, including North Carolina and Oregon, do not specify any minimum average daily traffic criteria.

*Efforts to Standardize Product Evaluation* - Product manufacturers and other parties have maintained that current product evaluation requirements are inefficient and burdensome. This is due to the fact that each state individually evaluates and approves products. Proponents of standardized product testing and evaluation point to the inherent advantages of national testing, including: elimination of duplication; enhanced public and private sector cooperation; streamlined product evaluation requirements for manufacturers; and “one-stop” shopping for states seeking information on products.

Past efforts to facilitate greater coordination in the testing and evaluation of transportation-related products have experienced limited success. Since the 1960's, the Federal Highway Administration, AASHTO, and other transportation entities have sponsored several programs that attempted to facilitate standardized testing and the development of a national database on product testing and evaluation. Representatives from these organizations speculated that these efforts have failed in part due to parochialism in the individual states. However, these representatives conceded that some of the objections raised by states were grounded in legitimate concerns relating to testing methods and the unique conditions of each state.

The most recent effort to create a mechanism for the standardized testing and reporting of transportation products is the National Transportation Product Evaluation Program (NTPEP). Sponsored by AASHTO with the cooperation of industry, the goal of this program is to provide test data to states on a range of products, materials and devices. This will enable the states to compare the performance of similar products and materials. The program does not accept or reject submitted materials, but instead, provides test and evaluation reports to member agencies for use in their decision-making processes. All testing and evaluations are conducted by state departments of transportation

under contract with AASHTO. Public and private cooperation ensures that test procedures are acceptable to both users and suppliers.

*New Product Evaluation* - Product evaluation administrators in other states indicated that product evaluation and testing is most problematic when dealing with a new type of product which is not addressed by an existing specification. Much of the difficulty stems from the fact that the transportation agency has to temporarily rely on the manufacturer's proprietary specification during the initial product testing period. If laboratory and field testing indicate that the product is suitable for the department's use, the department will attempt to write a non-proprietary or “generic” specification that will allow other products to enter the market and thus avoid the sole sourcing of the product. However, this sometimes leads to charges that the specification or supporting test methods are biased in favor of the initial product manufacturer.

In recognition of this and other problems associated with the evaluation of new types of products, several states have developed product evaluation procedures tailored to address new products. For example, several states we contacted have standing new product review committees. Similarly, in addition to the qualified or approved products list, some states maintain a new products list for items which are generally not addressed within existing specifications.

### **Performance-Related Specifications**

Product evaluation literature and interviews with federal and state transportation officials point to performance-related specifications as the long-term solution to many of the difficulties associated with product and material evaluation. However, the development of performance-related specifications involves a complex and time-consuming process of performance modeling and statistical analysis. Florida is one of only a handful of states that have to date attempted to develop and implement performance-related specifications.

*Defining Performance Specifications* - While traditional specifications are performance oriented in terms of their intent, the complexity and sophistication of modern transportation projects have raised questions regarding the ability of traditional specifications to provide the expected quality and accountability. Although there is some variation in the definition, performance-related specifications are generally recognized as specifications for materials and

construction quality characteristics that have been demonstrated to correlate with the long term performance of the finished work. These specifications are based on quantified relationships (models) between such characteristics measured at the time of construction and subsequent performance.

Unlike traditional specifications which address the components and processes used to produce the product, performance specifications are based on measurable attributes or properties of the finished product. Performance specifications are statistically based (prescribed sampling and testing criteria) and supported by performance modeling that correlates the performance of the finished product for specific materials and climatic conditions. In addition, performance specifications generally include financial incentives and disincentives based on the quality of the finished product.

*Use of Performance Specifications* - Until recently, most performance specification development programs have been limited to universities and industry consultants. Only recently have state transportation agencies initiated work on prototype performance specifications. One exception is the New Jersey Department of Transportation where operational performance specifications for portland cement concrete have been in place since 1990. Several of the states we interviewed indicated that they are currently establishing performance specification development programs.

In Florida, FDOT recently adopted a new specification for traffic stripes and markings which has many of the elements of performance specifications. Most significantly, the specification requires that the contractor provide a five year maintenance bond on the traffic stripes and markings. Unlike traditional specifications, this specification has no compositional requirements of its own. Contractors would have the option to use any material that meets the performance attributes established in the specification provided that the material is listed in the QPL. The department is also continuing to evaluate the use of performance warranties for certain categories of products and materials.

### **Conclusions and Recommendations**

The challenge for the department is to embrace new and innovative transportation products while, at the same time, preserving a competitive procurement environment and safeguarding the public's interest. This task has become more difficult in recent years as technological

advances have introduced an array of new products and materials onto the market. Based on our review it appears that transportation product evaluation is by its very nature rigorous, time-consuming, and sometimes cumbersome. Comparison of the department's QPL program with product testing programs in other states reveals that Florida's requirements and procedures are generally similar to those in other states, with some differences in testing standards and criteria.

However, this is not to say that the individual complaints we received were completely unfounded. For example, several complaints involved incidents where the department or its contractors failed to strictly adhere to evaluation procedures. Similarly, some complaints involved legitimate differences of opinion regarding the extent to which the prescribed testing requirements correlate with actual product usage. Finally, we noted that small firms with new types of products in particular seem to experience difficulties in navigating this often bureaucratic and fiercely competitive environment.

Product representatives who feel that they are unable to resolve their problems within FDOT should first look to entities such as the American Traffic Safety Services Association and the Florida Transportation Builders Association for assistance. These organizations represent forums for the discussion and resolution of problems relating to specifications and product evaluation. As a last resort, manufacturers and vendors may seek recourse through legal means.

*Recommended Actions* - In the course of our research we identified several actions relative to product evaluation that the department should implement. These recommended actions are discussed below.

One option which could expedite the product evaluation and selection process would be greater acceptance on the part of FDOT of standardized product testing and evaluation data, such as that provided through the National Transportation Product Evaluation Program. This would also enable the department to more readily draw on the experiences of other states and eliminate some of the debate surrounding the use of different test methods.

The department could improve the accessibility of the QPL program by allowing the public and product vendors to retrieve QPL-related policies, procedures, and forms via the FDOT web site. This would also allow the department to make suppliers aware of procedural

changes relating to the QPL. Similarly, the department should also consider making the QPL document itself (currently available via the Internet) available in a more user friendly format.

In recognition of the future significance of performance specifications, the department should, in cooperation with the Florida Transportation Builders Association and other industry representatives, establish a committee on performance specifications. This joint public/private committee could serve an important function as the department moves forward with the difficult task of developing and implementing performance specifications.

The department should also consider following the example of other states who have established product evaluation review committees to hear appeals from the manufacturers of products that were denied inclusion on the QPL. This would provide an opportunity for product representatives to voice their concerns and facilitate a two-way exchange of information. The department may also want to evaluate the benefits of establishing a separate listing of new products that are not addressed within existing specifications.

Finally, the department should continue to make certain that FDOT personnel, contractors, and subcontractors strictly adhere to all procedures relating to product evaluation and selection. Similarly, the department should ensure that program requirements, including testing standards, are consistently and uniformly applied to all products.

**RECOMMENDATIONS**

We recommend that the department implement the following actions:

- Increase its use and acceptance of national standards and testing data, such as that provided through the National Transportation Product Evaluation Program;
- Improve understanding and access to the product evaluation process by making the relevant QPL policies, procedures, and forms available via the FDOT web page;
- Establish a joint department/industry committee on performance-related specifications to assist the department in the development and implementation of performance-related specifications;
- Create a product evaluation review committee to hear appeals from the manufacturers of products that were denied inclusion on the QPL; and
- Ensure that FDOT personnel, contractors, and subcontractors strictly adhere to the appropriate product evaluation and testing procedures and apply those procedures consistently.

**COMMITTEE(S) INVOLVED IN REPORT** *(Contact first committee for more information.)*  
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**MEMBER OVERSIGHT**  
 Senators Tom Lee and Daryl Jones