Process Review and Evaluation Design and Type Selection of New, Reconstructed and Rehabilitated Pavements

PURPOSE

This review will be conducted to evaluate the processes and procedures used by the State DOT in design and type selection of new, reconstructed and rehabilitated pavements. The evaluation will be the basis for determining the acceptability of the state's process as required by FHPM 6-2-4-1.

SCOPE OF REVIEW

This review will be conducted entirely at the State DOT Central office and will involve personnel in the Office of Road Design, Materials and Advance Planning.

REFERENCES

Techniques for Pavement Rehabilitation - FHWA
1986 AASHTO Guide for Design of Pavement Structures
1972 AASHTO Interim Guide for Design of Pavement Structures
FHPM 6-2-4-1
1960 AASHTO An Informational Guide of Project Procedures

REVIEW TEAM

Date and place of inspection:

Review Team Members:

TRAFFIC PROJECTIONS

How are present traffic volumes, vehicle classification and truck weights estimated?

Interstate
Primary
Others

How are design traffic volumes, vehicle classification and truck weights estimated?

Interstate
Primary
Others

How are design l8-kip equivalent single axle loads (ESAL's) determined?

Interstate
Primary
Others

How are growth factors calculated?

What design method is used for A.C.

HMA ELEMENTS

What Regional factor is used for the following:

Interstate

Primary
Others

What is the terminal serviceability (Pt)?

How is soil support value determined?

Any correlation between k-value and AASHTO soil type? Any correlation between k-value and CBRs?

What layer coefficients are used for the following:

Surfacing
Base
Subbase
Other

What pavement performance period is used?

How are overlays designed?

What analysis period is used for the following:

Interstate
Primary
Other

What is used for roadbed soil resilient moduli?

What is the design terminal serviceability?

Is soil swelling considered? How?

Is frost heave considered? How?

How are the elastic moduli of the various layers measured/calculated?

What's the range of values [elastic (resilient) modulus] for the following:

Surface
Binder/Base
Asphalt Treated Subbase
Granular Subbase

How is drainage figured in asphalt design?

How is infiltrated water removed?

Are edge drains used?

Continuous or intermittent?

Is future clean-out facilities included in the design? (i.e., clean-outs, bends, skew, etc.)

Are edge drain outlets well marked for ease in locating? How?

PCC PAVEMENT

How is the modulus of elasticity calculated or tested?

How is the k-value determined?

What is the load safety factor and how was it determined?

How is the modulus of rupture determined?

Obtain and attach an explanation of the calculation to determine the amounts of fatigue resistance used. Compare the results against a 1972 AASHTO design for equivalent traffic. Is the State's system adequate?

How is drainage figured?

How are tied concrete shoulders accounted for?

What value in the design is given for edge deflection reduction due to the following:

tied shoulders -
-3' widening
-2' widening
-1 1/2' widening

Where did the figures to support the deflection reduction come from?

What criteria is used for joint spacing? What is the joint spacing?

When are dowels used?

Epoxy coating required?

What is the shape factor used in transverse joints?

What sealer is used?

What surface texture is used?

RELIABILITY

Are State personnel familiar with the use of the reliability concept

Has a reliability analysis been performed? If yes, what were the results?

If not, does the State intend to use the values in the 1986 AASHTO Guide on Page 11-10, Table 2.2?

What levels of reliability will be used for the following:

	RURAL	**URBAN**
Interstate		
Primary		
Secondary		

PAVEMENT TYPE SELECTION

What analysis period is used for the following:

Interstate
Primary
Other

What is used as evidence to support your assumed pavement life?

What discount rate is used?

How many alternates are normally considered?

Are the alternates compared on an equivalent basis?

Is first cost used? Life cycle cost used? Is present worth used?

Is recycling considered? Is construction staging considered? How?

Who makes the final selection as to pavement type and how do they do it?

PAVEMENT REHABILITATION SELECTION PROCESS

How is a project brought to the attention of the programmers?

Is the information on pavement condition taken from the Pavement Management Data Base?

Is the Pavement Management Data Base accessible to the designers?

Is the Pavement Management Data Base integrated such that useful outputs, i.e., traffic analysis, network trends, project programming, project rankings, etc., can be obtained for decision makers?

What NDT is done to verify project condition?

If project is in severe structural condition, are both rehabilitation and reconstruction considered? Is a life cycle cost analysis made for each alternate?

How many alternates are normally considered? How is the decision made as to what alternates to consider?

Are there written procedures or guidelines available to guide the new designer?

Is the cause of the failure/distress determined? Does the rehabilitation effort address the cause of distress?

If the rehabilitation effort isn't selected on the basis of the economic analysis then what other factors are considered in the final decision?