

# Migrating legacy (PMED v2) data libraries into the modern (PMED v3) software

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Most XML files containing PMED library data from older versions of the PMED app (e.g. the desktop app with version series 2.x) are directly compatible with version series 3.x (the web app). However, over the course of time in the development and release of new versions, some properties have been added to some of the XML file schemas. When uploading XML files from older versions of PMED in the web interface of v3.x, these new properties will be set to their default values. It is the user's responsibility to carefully review and, if necessary, adjust these properties to ensure they correspond to the expected values for their design input profile.

This document summarizes properties that have been added to PMED's library XML data schemas since approximately version 2.2. Library schemas that have not had any properties added are not included in this document.

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## 1. Library Type: Performance Criteria

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- XML schema: `AnalysisLimitsImport`

Two properties, a distress limit and a reliability percentage, have been added for the SJPCP-over-AC design type's performance criterion for longitudinal cracking in the PCC layer. The default limit is 15% of slabs, and the default reliability is 50%.

Here is a screenshot of the relevant UI section:

Performance Criteria	Limit	Reliability
Initial IRI (in/mi)	63 ✓	
SJPCP Longitudinal cracking (percent slabs)	15 ✓	50 ✓

## 2. Library Type: Calibration Factors

- XML schema: CalibrationMain

### 2.1. AC Bottom-Up Cracking

The  $C_2$  factor was updated and has the following defaults:

$$C_2 = \begin{cases} 2.1585 & \text{if } h_{AC} < 5 \\ 0.867 + 0.2583 h_{AC} & \text{if } 5 \leq h_{AC} \leq 12 \\ 3.9666 & \text{if } 12 < h_{AC} \end{cases}$$

Bottom up AC cracking C2: < 5 in.	2.1585 ✓
Bottom up AC cracking C2: 5 in. <= hac <= 12 in.	(0.867 + 0.2583 * hac) * 1 + 0 ✓
Bottom up AC cracking C2: > 12 in.	3.9666 ✓

### 2.2. AC Top-Down Cracking

Several factors were introduced for top-down cracking and have the following defaults:

$$\begin{aligned}
C_1 &= 2.5219 \\
C_2 &= 0.8069 \\
C_3 &= 1 \\
K_{L1} &= 64\,271\,618 \\
K_{L2} &= 0.2855 \\
K_{L3} &= 0.011 \\
K_{L4} &= 0.01488 \\
K_{L5} &= 3.266 \\
\sigma_{RE} &= 0.3657 \text{ TDC}_{\text{mean}} + 3.6563
\end{aligned}$$

Top down AC cracking C1	2.5219	✓
Top down AC cracking C2	0.8069	✓
Top down AC cracking C3	1	✓
Top down AC cracking kL1	64271618	✓
Top down AC cracking kL2	0.2855	✓
Top down AC cracking kL3	0.011	✓
Top down AC cracking kL4	0.01488	✓
Top down AC cracking kL5	3.266	✓
Top down AC cracking standard deviation	0.3657 * TOP + 3.6563	✓

### 2.3. AC Fatigue Cracking

The  $B_{f,1}$  factor was updated and has the following defaults:

$$B_{f,1} = \begin{cases} 0.02054 & \text{if } h_{AC} < 5 \\ 5.014 h_{AC}^{-3.416} & \text{if } 5 \leq h_{AC} \leq 12 \\ 0.001032 & \text{if } 12 < h_{AC} \end{cases}$$

AC fatigue BF1: < 5 in.	0.02054	✓
AC fatigue BF1: 5 in. <= hac <= 12 in.	$(5.014 * \text{Pow}(\text{hac}, -3.416)) * 1 + 0$	✓
AC fatigue BF1: > 12 in.	0.001032	✓

## 2.4. JPCP Friction

During the integration of NCHRP 1-51, several factors were introduced for JPCP friction and have the following defaults:

$$\begin{aligned} \text{friction degradation} &= 1 \\ C_c &= 1 \\ A &= 6 \\ B &= 20 \end{aligned}$$

Friction damage degradation	1	✓
Curling and other stresses (CC Factor)	1	✓
Built-in curling A	6	✓
Built-in curling B	20	✓

## 3. Library Type: Report Customization

- XML schema: ReportConfigurationSetting

Six properties have been added to allow users to determine the visibilities of larger sections in the PMED analysis output report. These properties apply to all designs, and the corresponding report sections default to visible.

Here is a screenshot of the relevant UI section:

Visibility	Report Section
<input checked="" type="checkbox"/> Show	Traffic
<input checked="" type="checkbox"/> Show	Climate
<input checked="" type="checkbox"/> Show	Design Properties
<input checked="" type="checkbox"/> Show	Analysis Output Charts
<input checked="" type="checkbox"/> Show	Layer Information
<input checked="" type="checkbox"/> Show	Calibration

## 4. Library Type: AC Material

- XML schema: AsphaltObject

Four categories of properties have been added to the AC Material library schema:  $|E^*|$  prediction, top-down cracking (TDC), indirect tensile (IDT) strength, and multiple stress creep recovery (MSCR) binder grading.

### 4.1. $|E^*|$ Prediction

- $|E^*|$  prediction model selection
  - A choice of two options: NCHRP 1-37A or NCHRP 1-40D (a.k.a. "G\*").
  - Defaults to 1-37A.

Use G\* for HMA  $|E^*|$  predictive model

### 4.2. TDC Properties

- Asphalt content by weight of mix
  - Defaults to 4.5%.
- Aggregate gradation parameter

- This value can be provided directly by the the user, or it can be calculated by the software based on the asphalt aggregate gradation values provided by the user.
- Defaults to being calculated by the software.

Percentage asphalt content by weight of mix (%)

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**Aggregate Gradation**

**Gradation** 📄 📋 ?

Gradation	Percent Passing
3/4 in sieve	<input type="text" value="100"/>
3/8 in sieve	<input type="text" value="77"/>
#4 sieve	<input type="text" value="60"/>
#200 sieve	<input type="text" value="6"/>

Enter user-calculated value for gradation parameter

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Aggregate gradation parameter

### 4.3. IDT Strength Properties

- IDT strength input level
  - Defaults to level 3, with all IDT strength values internally calculated.

**Indirect Tensile Strength**

Input Level

**Indirect Tensile Strength at 14 °F (psi)**  

Temperature (°F)	Indirect tensile strength (psi)
14	361.13634636251663
40	259.3543015974265
70	96.94868648900663
100	43.437884935415

- IDT strength maximum
  - Available only at input level 2.

**Indirect Tensile Strength**

Input Level

**Indirect Tensile Strength at 14 °F (psi)**  

Temperature (°F)	Indirect tensile strength (psi)
14	<input type="text" value="361.1363556635449"/> ✓
40	259.3543015974265
70	96.94868648900663
100	43.437884935415

- IDT strength matrix

- Available only at input level 1.

### Indirect Tensile Strength

Input Level

Number of temperatures

#### Indirect Tensile Strength at 14 °F (psi)

Temperature (°F)	Indirect tensile strength (psi)
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

#### 4.4. MSCR Binder Grading Properties

These properties are available only when (a) the dynamic modulus input level is at level 2 and (b) MSCR is the selected binder grading method.

- Temperature
- Complex shear modulus ( $G^*$ )
- Phase angle
- Percent recovery at 3200 Pa

## Asphalt Binder (Level 2 - MSCR)

Binder Category

MSCR

### MSCR Binder



Temperature (°F)

Binder G\* (Pa)

Phase angle (deg)

Recovery @ 3.2 Kpa (%)

0



0



0



0

