

Building Fragility

1 Overview

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Overview

This page is intended to help users get their own building fragilities into Ergo.

File Types and Format

There are two acceptable formats, comma separated value (CSV) and Extensible Markup Language (XML). The simplest way to get fragilities into Ergo is the CSV format which will internally be converted to XML. Both formats will be explained in their own section after the field descriptions.

Field Descriptions

Field Name	Field Description	Field Type	Acceptable Values	Informational
ID	Unique numeric identifier in the fragility dataset	Integer	N/A	No
Fragility ID Code	Unique key for each fragility (e.g. SF_C1_1 for structural fragility for C1 structure type)	String	N/A	No
Author	Identifies the person(s) who provided each fragility set.	String	N/A	Yes
Structure Type	Structure Type this fragility curve is designed for	String	N/A	Yes
Stories	Identifies the number of stories used for the model building when constructing fragilities. .	Integer	A value of "0" indicates multiple story levels were considered (for fragility surfaces)	Yes
Description	A textual description providing information about the derivation of this fragility curve set	String	N/A	Yes
Ground Motions	Ground motion records used for time-history analyses when constructing fragilities	String	N/A	Yes
Code	Design code for the fragility set	String	High-Code, Moderate-Code, Low-Code, Pre-Code	Yes
Damage Type	The type of damage type this fragility represents	String	Structural, Non-Structural	Yes
Demand Type	The demand type required by the fragility, can include the period if applicable (e.g. 0.2 Sa)	String	PGA, PGV, PGD, Sa, Sd, Sv	No
Demand Unit	The units of the demand type	String	g, %g, etc	No
Limit States	The limit states which define the transitions between damage states for each fragility set.	String	3 limit states with a colon delimiter (e.g. Moderate: Extensive: Complete)	No
T Eqn Type	Equation to estimate the natural period of a building.	Integer	1, 2, or 3 (see technical manual)	No
T Eqn Param0	First parameter to estimate natural period	Double	N/A	No
T Eqn Param1	Second parameter to estimate natural period	Double	N/A	No
T Eqn Param2	Third parameter to estimate natural period	Double	N/A	No
Frag Eqn Type	Fragility equation type.	Double	1 - Lognormal distribution, 2 - Normal Distribution	No
Parameters	The number of fragility parameters (e.g. 6 if three curves with median and beta), 18 if a surface.	Integer	N/A	No
Median0	First fragility median value	Double	N/A	No
Beta0	First fragility beta value	Double	N/A	No
Median1	Second fragility median value	Double	N/A	No

Beta1	Second fragility beta value	Double	N/A	No
Median2	Third fragility median value	Double	N/A	No
Beta2	Third fragility beta value	Double	N/A	No

In the sample fragility file, you will notice there are additional fields (e.g. FS Param 0, FS Param 1, etc). These fields are reserved for surface fragilities and can be ignored if you don't have surface fragilities. If you do have surface fragilities, see the [technical manual](#) section on "Fragility Surface Parameters" for more information. A brief description of these additional fields can be seen in the below:

Limit State	Field Name	Field Description	Field Type	Acceptable Values	Informational
Limit State 1 PL1	FS Param0	Surface equation parameter - _11	Double	N/A	No
	FS Param1	Surface equation parameter - _12	Double	N/A	No
	FS Param2	Surface equation parameter - _13	Double	N/A	No
	FS Param3	Surface equation parameter - _14	Double	N/A	No
	FS Param4	Surface equation parameter - _21	Double	N/A	No
	FS Param5	Surface equation parameter - _22	Double	N/A	No
Limit State 2 PL2	FS Param6	Surface equation parameter - _11	Double	N/A	No
	FS Param7	Surface equation parameter - _12	Double	N/A	No
	FS Param8	Surface equation parameter - _13	Double	N/A	No
	FS Param9	Surface equation parameter - _14	Double	N/A	No
	FS Param10	Surface equation parameter - _21	Double	N/A	No
	FS Param11	Surface equation parameter - _22	Double	N/A	No
Limit State 3 PL3	FS Param12	Surface equation parameter - _11	Double	N/A	No
	FS Param13	Surface equation parameter - _12	Double	N/A	No
	FS Param14	Surface equation parameter - _13	Double	N/A	No
	FS Param15	Surface equation parameter - _14	Double	N/A	No
	FS Param16	Surface equation parameter - _21	Double	N/A	No
	FS Param17	Surface equation parameter - _22	Double	N/A	No

Import Sample Fragility

You can download an example CSV file with fragility data here: [Ergo_Fragility_Example.csv](#) After downloading the sample building fragility file, follow the steps found in the [Bridge Fragility](#) example to ingest the data. The only difference will be when selecting the **data type**, select **Building Fragilities**. The rest of the steps are identical.