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**ANÁLISIS DE LA INFLUENCIA DEL BIODETERIORO DE LA GUADUA EN LA
RESPUESTA CÍCLICA DE MUROS DE BAHAREQUE CARGADOS EN EL PLANO**

PROYECTO DE GRADO PARA OPTAR AL TÍTULO DE
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¡Al ser universal que creó esta tierra, nuestro hogar, nuestras vidas y todas las cosas bonitas de la vida que nos motivan a querer navegar a través de ella y querer aprender de todo lo que vemos y querer superar nuestros límites cada día ¡

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RESUMEN

El sistema constructivo de bahareque no cementado, muros compuestos de *Guadua angustifolia* y madera aserrada rellenos con mezclas de tierra, representa una alternativa sostenible, usando materiales típicos de estas regiones viable para mitigar el déficit habitacional que afecta a más de 2.3 millones de hogares rurales en Colombia. Sin embargo, a pesar de su uso histórico en las regiones, es limitada la documentación técnica relacionada con la afectación estructural en los elementos de guadua no tratados ante el biodeterioro; daño ocasionado por agentes ambientales como la humedad y presencia de insectos xilófagos y hongos.

La presente investigación evaluó la influencia del biodeterioro en la respuesta cíclica de los elementos de guadua que conforman los muros de bahareque mediante modelos de los Elementos Finitos (FEM), empleando ANSYS Mechanical APDL controlado mediante scripts en Python a través de la librería PyMAPDL. Se calibraron tres modelos con las topologías en pórtico en guadua (GS), pórtico con latas de guadua (GHS) y pórtico con latas relleno de tierra (GSHS); con datos experimentales extraídos de ensayos de carga cíclica.

El análisis paramétrico del biodeterioro en los elementos de guadua, se realizó mediante el método de *Muestreo por Hipercubo Latino* (LHS, N=100) con distribución normal truncada sobre su módulo de elasticidad. Se formularon 4 zonas de vulnerabilidad ante el biodeterioro y se evaluaron cinco escenarios de daño (A–E) sobre las tres topologías, totalizando 1400 iteraciones computacionales. La convergencia estadística se verificó mediante la estabilización asintótica del Coeficiente de Variación (COV), con diferenciales menores al 4.01%.

La degradación estocástica evidenció que, el biodeterioro en elementos de guadua reduce de forma cuantificable la capacidad de servicio de los muros de bahareque bajo cargas laterales equivalentes, siendo el daño en uniones y bases de columnas los modos más críticos de daño individual de los modelos estudiados. Los hallazgos demuestran que, en todas las tipologías, al aplicar biodeterioro simultáneamente en las cuatro zonas de vulnerabilidad, generó una amplificación sinérgica que superó la superposición lineal de los escenarios individuales.

Palabras Clave: bahareque no cementado, biodeterioro, *Guadua angustifolia*, método de elementos finitos, ANSYS, PyMAPDL, análisis paramétrico, Muestreo por Hipercubo Latino (LHS).

ABSTRACT

The uncemented *bahareque* construction system, composed of walls of *Guadua angustifolia* and sawn timber filled with earth mixtures, represents a sustainable alternative, using materials typical of these regions and viable for mitigating the housing deficit that affects more than 2.3 million rural households in Colombia. However, despite its historical use in these regions, there is limited technical documentation regarding the structural impact of biodeterioration on untreated guadua elements; damage caused by environmental agents such as humidity and the presence of wood-boring insects and fungi.

This research evaluated the influence of biodeterioration on the cyclical response of the guadua elements that make up the *bahareque* walls using Finite Element Modeling (FEM), employing ANSYS Mechanical APDL controlled by Python scripts through the PyMAPDL library. Three models were calibrated using the following topologies: guadua frame (GS), guadua frame with strips (GHS), and earth-filled guadua frame (GSHS), with experimental data extracted from cyclic loading tests.

The parametric analysis of biodeterioration in the guadua elements was performed using the Latin Hypercube Sampling (LHS, N=100) method with a truncated normal distribution applied to its elasticity's modulus. Four biodeterioration's vulnerability zones were defined, and five damage scenarios (A–E) were evaluated on the three topologies, totaling 1400 computational iterations. Statistical convergence was verified through the asymptotic stabilization of the Coefficient of Variation (COV), with differentials less than 4.01%.

Stochastic degradation analysis revealed that biodeterioration in guadua elements quantifiably reduces the service capacity of *bahareque* walls under equivalent lateral loads, with damage to joints and column bases being the most critical modes of individual damage in the studied models. The findings demonstrate that, in all typologies, applying biodeterioration simultaneously to the four vulnerability zones generated a synergistic amplification that exceeded the linear superposition of the individual scenarios.

Keywords: uncemented *Bahareque*, biodeterioration, *Guadua angustifolia*, finite element method, ANSYS, PyMAPDL, parametric analysis, Latin Hypercube Sampling (LHS).

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1 INTRODUCCIÓN

1.1 Descripción del problema

Según los objetivos y metas de desarrollo sostenible establecidos por las Naciones Unidas, se requiere dar fin a la pobreza y construir comunidades sostenibles (Naciones Unidas, 2022). De acuerdo con el Informe Sintetizado del ODS 11 del Foro Político de Alto Nivel del año 2023, se estima que más de 1.600 millones de personas en el planeta están afectadas por diversas formas de déficit de vivienda, de las cuales cerca de 1.100 millones residen en barrios marginales y asentamientos informales (United Nations Human Settlements Programme, 2023). Dependiendo del traslape de los indicadores de déficit de vivienda, el rango de variación de personas afectadas oscila entre 1.600 millones y 3.000 millones.

En el ámbito nacional, el Ministerio de Vivienda de Colombia reportó en el año 2023 que más de 2.3 millones de hogares rurales presentan déficit de vivienda, de los cuales el 24 % corresponde a un déficit cuantitativo y el 57 % a un déficit cualitativo (Ministerio de Vivienda Ciudad y Territorio, 2023). El acceso a viviendas constructivamente seguras, adecuadas y sostenibles para la población vulnerable de las zonas rurales de Colombia se encuentra limitado por las dificultades de acceso a los materiales tradicionales de construcción y por la ausencia de estándares técnicos que garanticen condiciones seguras de habitabilidad. De acuerdo con el Documento de Trabajo sobre Investigación de Políticas 8746 del Banco Mundial, Colombia contaba en 2019 con un Índice de Acceso Rural (RAI) del 23.9 % (Mikou et al., 2019), indicador que refleja la dificultad y el alto costo que implica adquirir materiales convencionales de construcción —ladrillo, concreto, acero— en las zonas rurales del país. Por lo anterior, se concluye que es necesario aplicar soluciones alternativas de vivienda que sean sostenibles, construidas con materiales típicos y asequibles en estas regiones, y que resulten técnicamente seguras para su ocupación.

Un tipo de solución tradicional en el país que se ajusta a lo anterior son las viviendas construidas en muros de bahareque no cementado, un sistema compuesto por pórticos de guadua, madera o una combinación de ambos, rellenos manualmente en su interior con una mezcla de suelos, materiales fibrosos y agua en estado plástico. Esta alternativa histórica y empírica se convierte en una opción idónea para la construcción en zonas tropicales y rurales, donde la disponibilidad de materiales de construcción convencionales puede ser limitada. Existen diversos

registros históricos que reportan que viviendas de uno y dos pisos construidas con este sistema empírico han soportado exitosamente eventos sísmicos; un ejemplo de ello son los registros obtenidos tras el terremoto de Armenia en enero de 1999, donde varias viviendas construidas bajo este sistema permanecieron en pie y habitables con pequeñas reparaciones (Castillo et al., 1999).

A pesar de lo anterior, el uso de materiales alternativos de construcción está regido por la normativa NSR-10 (Asociación Colombiana de Ingeniería Sísmica, 2010) y la Ley 400 de 1997 (Congreso de la República de Colombia, 1997), cuyos artículos 10 y 11 establecen que los métodos alternativos deben ser autorizados por la Comisión Asesora Permanente para el Régimen de Construcciones Sismo Resistentes y sustentados mediante métodos de análisis y diseño estructural distintos a los prescritos. Esto evidencia la necesidad de que este sistema constructivo tradicional sea evaluado desde una perspectiva sismorresistente, a fin de que pueda integrarse a las normas de diseño nacionales y ser empleado con la seguridad requerida. Adicionalmente, es común que el sistema constructivo empleado en el bahareque de tierra tradicional se centre en resolver la necesidad habitacional sin atender aspectos clave como la durabilidad. En muchos casos, los elementos estructurales de guadua, como los pies y las diagonales de los paneles, no reciben tratamientos preventivos para evitar su biodeterioro —principalmente el generado por el ataque de insectos—, el cual tiene efectos directos en la respuesta mecánica del sistema. Por tanto, resulta imperativo cuantificar estas pérdidas de rigidez transversal bajo métodos numéricos estandarizados, lo que conduce a la formulación de la siguiente pregunta de investigación:

¿Cómo influye el biodeterioro en elementos de guadua en la respuesta cíclica de muros de bahareque cargados en el plano?

1.2 Objetivos de la investigación

1.2.1 Objetivo general

Evaluar la influencia del biodeterioro en la respuesta cíclica de muros de bahareque mediante simulaciones computacionales por el método de los elementos finitos para identificar el efecto de tratamientos químicos que velan por la durabilidad de los elementos de guadua del sistema tradicional empleado en el municipio de Jamundí Valle del Cauca.

1.2.2 Objetivos específicos

- Construir un modelo numérico con el método de los elementos finitos que represente la respuesta de muros de bahareque con pies y diagonales de guadua cargados en el plano en laboratorio.
- Establecer una metodología aleatoria de inclusión de elementos de guadua con biodeterioro mediante una aproximación probabilística.
- Analizar el efecto de la inclusión de elementos de guadua con biodeterioro mediante un análisis paramétrico sobre un modelo numérico.

1.3 Alcance y limitaciones

En la presente propuesta se analiza el efecto del biodeterioro de elementos de guadua en la respuesta cíclica de muros de bahareque cargados horizontalmente en el plano mediante simulación numérica con el uso del método de elementos finitos. La investigación es de tipo cuantitativa, orientada sobre un caso único específico, realizando el análisis y la evaluación del módulo estructural asumiendo los parámetros de una zona rural de Colombia con amenaza sísmica alta. Para la validación del comportamiento mecánico del material, se utilizan los datos experimentales existentes obtenidos dentro del proyecto de investigación “*Propuesta de edificación rural eco-amigable con muros de bahareque no cementado*” de la Pontificia Universidad Javeriana Cali (Cristancho, 2024), estableciendo así el efecto estructural de no considerar tratamientos previos que eviten el deterioro por ataque biótico.

Como limitación fundamental, el alcance de la modelación constitutiva se restringe al rango elástico secante, adoptando la metodología de Energía Equivalente Elástico-Plástica (EEEP, bajo los lineamientos de la norma ASTM E2126 (ASTM International, 2011)). En este sentido, la calibración cinemática se ejecuta exclusivamente mediante una topología de resortes lineales (elementos COMBIN14). Se excluyen de forma explícita los modelos de colapso no-lineal y de mecánica de daño, a favor de una aproximación probabilística enfocada en la pérdida de rigidez del marco estructural.

Bajo este enfoque, la vulnerabilidad del sistema se evalúa numéricamente a través de Estados Límite de Servicio (SLS). La degradación de las propiedades mecánicas se asigna en zonas de

vulnerabilidad empleando un muestreo estocástico mediante la técnica de Hipercubo Latino (LHS). Por restricciones de costo computacional y suficiencia estadística, el análisis paramétrico está delimitado a $N = 100$ iteraciones por cada escenario evaluado, cubriendo un total de 14 combinaciones topológicas y espaciales.

1.4 Organización del documento

La estructura del presente documento se divide en siete capítulos, organizados de la siguiente manera:

- El *Capítulo 1* sintetiza la descripción del problema de investigación, enuncia la pregunta central, los objetivos trazados y delimita el alcance y las limitaciones del estudio.
- El *Capítulo 2* presenta el marco teórico, abarcando las generalidades del sistema de bahareque no cementado, la modelación de los modelos y su calibración, los mecanismos de biodeterioro estructural en la guadua y los fundamentos de los métodos de análisis probabilístico mediante LHS y Estados Límite de Servicio (SLS).
- En el *Capítulo 3* se expone el desarrollo del modelo numérico mediante el Método de los Elementos Finitos (FEM), detallando la definición geométrica, la asignación de propiedades constitutivas, la configuración topológica de resortes lineales y la ejecución de la calibración elástica.
- El *Capítulo 4* describe la metodología probabilística de biodeterioro, incluyendo la caracterización estadística, la jerarquía de las zonas de vulnerabilidad, los escenarios de degradación y la arquitectura computacional diseñada para la ejecución estocástica LHS.
- El *Capítulo 5* se ejecuta el análisis paramétrico: evaluación de biodeterioro en escenarios de vulnerabilidad. Se incluye la validación estadística de convergencia, el establecimiento de los umbrales de daño SLS, la formulación de curvas de fragilidad lognormal y la discusión de los hallazgos estructurales obtenidos.
- En el *Capítulo 6* se consolidan las conclusiones derivadas del logro de los objetivos específicos, así como las recomendaciones propuestas para futuras líneas de investigación.

- El *Capítulo 7* contiene las referencias bibliográficas que fundamentan el desarrollo teórico y metodológico de la tesis.

2 MARCO TEÓRICO

Este capítulo establece las bases conceptuales que fundamentan la presente investigación. La revisión teórica se estructura en cinco componentes principales: las generalidades anatómicas del sistema estructural bahareque no cementado, los principios de modelación numérica mediante el Método de Elementos Finitos (FEM, por sus siglas en inglés), los mecanismos bióticos de biodeterioro en materiales lignocelulósicos, las técnicas de análisis probabilístico para la evaluación de vulnerabilidad, y la revisión de antecedentes experimentales que justifican el enfoque metodológico adoptado.

2.1 El sistema constructivo bahareque no cementado

A continuación, se abordará el sistema de bahareque no cementado, su definición, sus características y la clasificación de los materiales que lo componen que serán abarcados en esta investigación.

2.1.1 Definición y caracterización tipológica

El bahareque es un sistema constructivo tradicional compuesto por un entramado portante de madera o bambú (como la *Guadua angustifolia*), provisto de un relleno o matriz de tierra y recubrimientos diversos que pueden incluir pañetes de cagajón, morteros o láminas (Asociación Colombiana de Ingeniería Sísmica - AIS, 2002).

En el contexto específico de esta investigación, el objeto de estudio se clasifica formalmente como *bahareque no cementado*. Este sistema, conocido internacionalmente bajo la denominación de *wattle and daub*, se caracteriza por estar compuesto de un esqueleto portante de madera o bambú y una matriz de cerramiento en tierra cruda. De acuerdo con (Nabouch, 2018) y (Bibal et al., 2026), el entramado asume integralmente la capacidad de carga estructural, mientras que la mezcla de suelo no estabilizado funciona como barrera física. Este sistema se diferencia fundamentalmente de las tipologías modernas por la ausencia de recubrimientos o inyecciones cementicias, condición

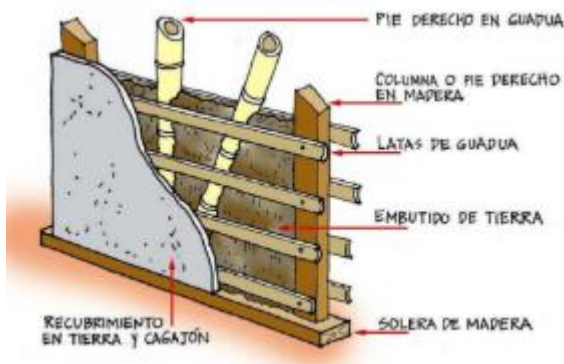
que preserva la flexibilidad inherente del conjunto y evita la rigidización artificial de los componentes.

2.1.2 Materiales y clasificación para la investigación

Las estructuras de bahareque pueden clasificarse en distintos tipos según el recubrimiento de los muros y la conformación de su entramado. Para la presente investigación, el enfoque se centra en el bahareque conformado por entramados con pies derechos y diagonales en *Guadua angustifolia*, madera aserrada para las soleras superiores e inferiores y relleno de tierra con fibras naturales (ver figura 1).

El sistema de conexiones mecánicas entre los elementos del entramado estructural se realiza mediante clavos de acero liso. La disposición y cantidad de estos conectores es crítica para evitar el rajado longitudinal de las fibras de la guadua. Físicamente, el sistema carece de anclajes o uniones perfectamente rígidas, por lo que su capacidad de disipación de energía ante solicitaciones de carga cíclica depende enteramente del nivel de fricción, del aplastamiento local de la fibra en las uniones y del grado de confinamiento proporcionado por la matriz de tierra (Cristancho, 2024).

Figura 1 Componentes típicos del muro de bahareque relleno de tierra



Nota. Fuente: Asociación Colombiana de Ingeniería Sísmica (2002).

2.2 Modelación de estructuras mediante elementos finitos

En esta sección, se abordará el tipo de software de elementos finitos usado para esta investigación, así como conceptos básicos utilizados para modelar el comportamiento de los muros en bahareque.

2.2.1 Conceptos básicos y software ANSYS

Las estructuras discretas son aquellas formadas por un ensamblaje de elementos claramente diferenciados entre sí y unidos en una serie de puntos discretos, de tal manera que el sistema total adopta la forma de una malla o retícula. La característica fundamental de estas estructuras es que su respuesta mecánica puede definirse mediante un número finito de parámetros, como las deformaciones y rotaciones en los nudos. De esta manera, el equilibrio global se representa mediante un sistema de ecuaciones algebraicas (Celigueta, 2000).

El *Método de los Elementos Finitos (FEM)* emplea la hipótesis de discretización sustentada en los siguientes principios: - El dominio continuo se divide en una serie de regiones contiguas con formas geométricas normalizadas, denominadas elementos finitos. - Los elementos se interconectan en un número discreto de puntos o nodos. - Los grados de libertad (desplazamientos y rotaciones) de los nodos constituyen las incógnitas básicas del problema matriz. - El desplazamiento de cualquier punto interior se determina a partir de los desplazamientos nodales mediante funciones de forma.

Esta aproximación numérica requiere herramientas computacionales robustas para la solución de las matrices de rigidez globales. Para el presente proyecto, se emplea ANSYS Mechanical APDL. ANSYS es un código de simulación reconocido mundialmente por su precisión y arquitectura programable (ANSYS, 2025). El flujo de trabajo en ANSYS comprende tres etapas críticas: el preproceso (definición de topología, propiedades constitutivas y mallado), la solución (imposición de condiciones de frontera y algoritmos de convergencia estática) y el postproceso (extracción de desplazamientos y rotaciones, así como las fuerzas internas).

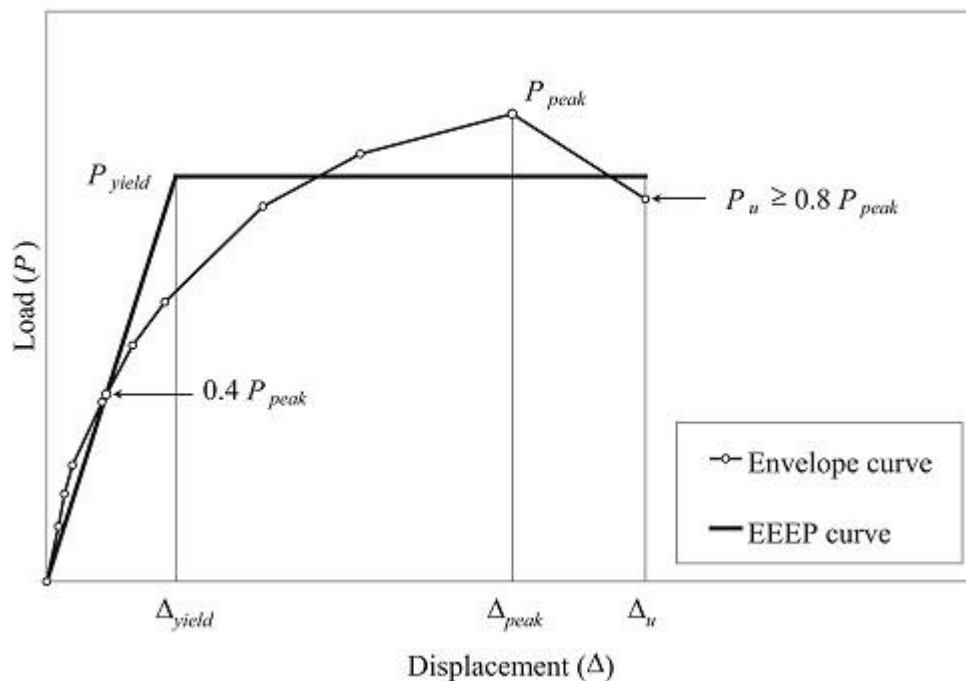
2.2.2 Justificación de linealización: Metodología EEEP

La modelación de muros de bahareque bajo cargas laterales ha recurrido históricamente a formulaciones no lineales para capturar el daño acumulado, el aplastamiento de las conexiones y el desprendimiento de la tierra. Sin embargo, para la ejecución de cientos de iteraciones en un estudio paramétrico probabilístico, los modelos constitutivos inelásticos imponen un costo computacional prohibitivo y un riesgo crítico de divergencia numérica prematura.

Como alternativa metodológica rigurosa, se fundamenta el uso de la linealización basada en el concepto de Rigidez Secante Equivalente, formalizada a través del criterio *Equivalent Energy Elastic-Plastic (EEEEP)* propuesto por la norma ASTM E2126. El principio EEEP establece que la curva no lineal real de fuerza-desplazamiento de un sistema estructural que entra en fluencia puede aproximarse mediante un modelo bilineal equivalente que encierre la misma cantidad de energía de deformación (ASTM International, 2011).

En el contexto de la simulación por elementos finitos, esto implica que la topología puede modelarse en el rango elástico lineal, siempre y cuando la constante constitutiva de rigidez de los conectores se calibre utilizando la rigidez cortante elástica (K_e) evaluada al 40% de la fuerza máxima ($0.4P_{peak}$) de los ensayos experimentales. Este enfoque define correctamente la pendiente elástica inicial según el método de la curva elasto-plástica de energía equivalente (EEEEP), capturando la rigidez cortante elástica y así evitar la integración temporal inelástica para este proyecto.

Figura 2 Parámetros de desempeño del ensayo



Nota. Fuente: ASTM E2126-11 (2011).

2.2.3 Teoría de resortes lineales (COMBIN14)

Para implementar físicamente la aproximación secante EEEP en el entorno de ANSYS, se recurre al uso de elementos discretos para caracterizar las interfaces de conexión, que en sistemas de entramado dictan la inmensa mayoría del desplazamiento lateral macroscópico.

El elemento seleccionado es el resorte lineal COMBIN14 tridimensional. Según la sección 13.14 del manual de referencias teóricas de ANSYS, este elemento tipo resorte-amortiguador, el cual tiene capacidad longitudinal o torsional en 1-D, 2-D o 3-D, permite representar rigidez, amortiguamiento e incluso endurecimiento por tensión. Se define por la ubicación de dos nudos espaciales y una constante de rigidez elástica primaria. La matriz de rigidez elemental del COMBIN14 es inherentemente lineal y obedece a la Ley de Hooke, operando como un enlace elástico puro que controla el deslizamiento relativo entre elementos adyacentes a nivel nodal (ANSYS, 2025).

Al erradicar formulaciones de contacto complejas o plasticidad concentrada, y reemplazar la física de las uniones clavadas e interacción suelo-estructura por un mapeo topológico de resortes COMBIN14, se garantiza una solución estática matemáticamente incondicional. La vulnerabilidad estructural o el ablandamiento biótico ya no se simula iterativamente por daño interno, sino que se introduce penalizando externamente y de forma directa el valor de la rigidez del resorte de conexión, lo cual constituye el pilar procedimental del análisis probabilístico.

2.3 Biodeterioro en la guadua

A continuación, se hablará de los fundamentos de esta patología del biodeterioro, su afectación mecánica en las estructuras de guadua, aspectos fundamentales para la elaboración de este trabajo.

2.3.1 Patología del biodeterioro

El biodeterioro estructural se define como el proceso irreversible de degradación física o daño del material de guadua causado por agentes biológicos como insectos, hongos y microorganismos, los cuales pueden comprometer la integridad estructural de especímenes tratados de forma inadecuada. (Cristancho et al., 2025). Los materiales naturales utilizados en la construcción de bahareque, como lo son la guadua, la tierra y madera, son susceptibles al deterioro frente a

condiciones higrotérmicas tales como la humedad, la colonización de agentes bióticos, principalmente insectos xilófagos (coleópteros y termitas) y hongos. Particularmente, es difícil detectar el ataque de insectos, hongos y líquenes a las estructuras de bahareque; solamente es posible observarlo cuando el deterioro ya es avanzado (Asociación Colombiana de Ingeniería Sísmica - AIS, 2002).

Figura 3 *Guadua con y sin biodeterioro*



Nota. Fuente: (Cristancho, 2024).

La *Guadua angustifolia* al ser un material higroscópico, que la hacen particularmente propensa a absorber la humedad hasta llegar al equilibrio con el medio ambiente. Este proceso puede generar el deterioro de la guadua si no cuenta con tratamientos de inmunización que eliminen los almidones y azúcares en su estructura molecular, ya que estos son los elementos más atractivos para los agentes bióticos, que generan biodeterioro en la guadua conjuntamente con la humedad (Pineda, 2017).

Cuando la guadua presenta patologías de biodeterioro, se reduce considerablemente su resistencia a la compresión uniaxial y disminución de su módulo de elasticidad, por ende, su reducción de la rigidez axial (Cristancho, 2024). El ataque de insectos y hongos a la guadua genera pérdida de sección (huecos en su sección transversal). Lo anterior, sumado a la exposición ambiental genera blanqueamiento, decoloración y fisuración de las fibras superficiales, lo que disminuye su capacidad de carga (International Network for Bamboo and Rattan, 2016).

2.3.2 Impacto mecánico de biodeterioro

El aumento de la humedad y la consiguiente colonización fúngica afectan las bases de las columnas y la matriz celular alrededor del vástago de acero del conector. En (Asociación Colombiana de Ingeniería Sísmica - AIS, 2002) se muestran los daños por transmisión de humedad de la cimentación y su traslado por medio de capilaridad desde los suelos al interior de la guadua, generando la patología de biodeterioro en las bases de las columnas. Así mismo, las imágenes de (International Network for Bamboo and Rattan, 2016) muestra biodeterioro ocurriendo en los elementos debido a abejas, termitas y hongos, varios de ellos ocurrido en las bases de columnas de las estructuras de guadua.

Figura 4 Daño por termitas y hongos en guadua



Nota. Fuente: (International Network for Bamboo and Rattan, 2016).

Aunque no hay estudios académicos que determine la relación del impacto del biodeterioro en la rigidez de las uniones, se puede establecer la importancia de las uniones en la estabilidad estructural en los muros de bahareque y su impacto en el comportamiento global de la estructura. Durante los ensayos de carga cíclica de (Cristancho, 2024), se observó cómo los clavos de acero que componían los muros en bahareque se aflojaban, salían y entraban repetidamente en las conexiones de la guadua y la madera debido a los ciclos de carga, causando desalineación y pérdida de soporte y cómo los ciclos repetitivos de carga terminan fisurando y fracturando las tiras de guadua justo en los puntos donde se insertaron los clavos de acero. Similarmente, Herrera & Takeuchi (2009) observaron fallas en las uniones entre los elementos, así como el desgarramiento

de pernos en viga-columna y desprendimiento de uniones entre soleras y paneles prefabricados de bahareque.

2.4 Análisis probabilístico de evaluación del daño

Este apartado aborda los fundamentos del enfoque probabilístico empleado para evaluar la vulnerabilidad y el daño estructural bajo escenarios de incertidumbre. Se detalla el método para realizar el análisis paramétrico y la los umbrales para caracterizar el daño en este documento.

2.4.1 Análisis paramétrico y muestreo por Hipercubo Latino (LHS)

La evaluación cuantitativa del impacto mecánico que induce el biodeterioro a muros de bahareque a escala real requiere abordar la incertidumbre del daño causado por el biodeterioro a sus elementos. Por un lado, un análisis paramétrico, definido en Herrada, (2016), es un método donde se varían parámetros de entrada, para observar y analizar su efecto sobre una situación o escenario. En el ámbito estructural, permite evaluar el comportamiento estructural modificando sistemáticamente variables de diseño o daño aisladas, mapeando así la relación causa-efecto de cada componente estructural de forma determinista. Sin embargo, el biodeterioro en la realidad no ocurre de manera homogénea en un muro, lo que introduce una incertidumbre con respecto a cuáles elementos fallarán. Por lo tanto, se hace indispensable integrar un método probabilístico (o estocástico), el cual se incorpora una incertidumbre que se tiene sobre parámetros y asigna funciones de distribución estadística a dichas variables para modelar su aleatoriedad natural (Universidad de La Laguna. Departamento de Ingeniería, 2011).

En escenarios normales, las variaciones probabilísticas en los modelos numéricos se han abordado mediante el método tradicional de Monte Carlo. Sin embargo, para modelos de elementos finitos (FEM) con múltiples grados de libertad espaciales, Monte Carlo exige un volumen computacionalmente extensivo de iteraciones y simulaciones. Por lo tanto, se debe mejorar la eficiencia computacional de las tareas que consumen más tiempo en el análisis de confiabilidad para simulaciones de Monte Carlo mediante elementos finitos (Charpis & Papadrakakis, 2003).

Para superar esta limitación algorítmica, la presente investigación adoptó la técnica conocida como Muestreo por Hipercubo Latino (Latin Hypercube Sampling - LHS). El LHS incorpora

muchas de las características deseables del muestreo aleatorio y del muestreo estratificado, y produce resultados de análisis más estables que el muestreo aleatorio (Helton and Davis, 2002). Al forzar analíticamente la extracción de un valor exclusivo por cada intervalo de igual probabilidad, el LHS garantiza una estratificación densa a lo largo de todo el dominio de la variable. En nuestro contexto, esto asegura que todo el espectro patológico sea inyectado uniformemente en las simulaciones, permitiendo capturar los efectos de cada escenario de daño; logrando un análisis paramétrico-estocástico estable y eficiente, con una menor cantidad de ciclos de cómputo que demandaría un muestreo puramente aleatorio.

2.4.2 Estado Límite de Servicio (SLS) en evaluación de daño

Una curva de fragilidad es una representación gráfica de la probabilidad de que una estructura alcance o exceda un cierto estado de daño (e.g., leve, moderado, severo, colapso), en nuestro caso, causadas por biodeterioro, en función de una medida de intensidad (Centro Geotécnico Internacional CGI, 2025). Sin embargo, al tener datos extraídos de ensayos de laboratorio de muros de bahareque sometidos a cargas laterales cíclicas, y al usar solo los datos lineales de las curvas de histéresis, no se usaron estados últimos como criterio de daño, sino los estados límites de servicio (Serviceability Limit State - SLS).

Los Estados Límites de Servicio (SLS) se establecen para evaluar cuando se llega a un estado límite de comportamiento, determinando el inicio o la ocurrencia de un modo de comportamiento inaceptable de dicho sistema o construcción (Razo, et al. 2020). Bajo el criterio de evaluación de este trabajo, correspondiente a las deflexiones laterales en la parte superior de los modelos, la interacción entre el muestreo probabilístico y los límites de servicio permitirá determinar la probabilidad de excedencia con que la deformación de los modelos supera los límites de servicio admisibles.

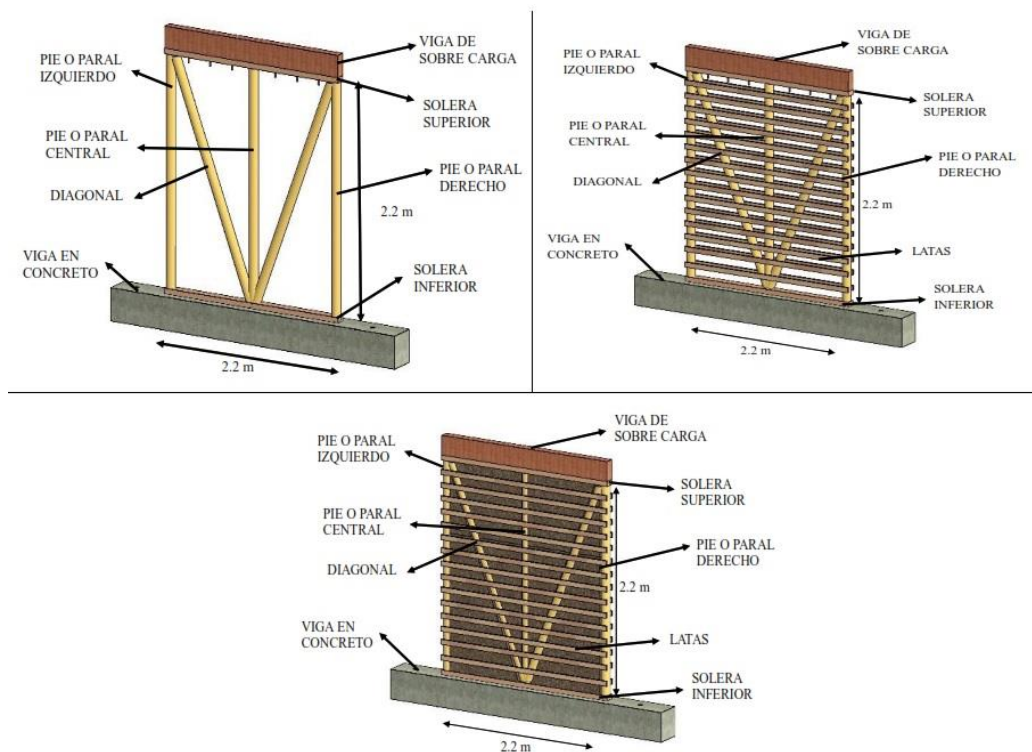
2.5 Antecedentes de la investigación

Este numeral recopila los antecedentes fundamentales del proyecto, describiendo la evidencia experimental existente, y los motivos por los cuales la presente investigación abordó la modelación lineal de elementos finitos.

2.5.1 Evidencia experimental y topologías previas

El estudio desarrollado por Cristancho (2024) reportó el desempeño histerético y los mecanismos cinemáticos de fallo in-situ de muros de bahareque a escala natural. De dichos especímenes, ensayados en laboratorio, destacamos las 3 tipologías que estaban conformados principalmente por guadua, las cuales se componen por 3 columnas en guadua con soleras superiores e inferiores en madera aserrada, rigidizados por diagonales en guadua. El modelo *Guadua skeleton* (GS) no tiene elementos adicionales a los mencionados, el modelo *guadua skeleton horizontal strips* (GSH) adiciona tiras horizontales en guadua y el modelo *Guadua skeleton with horizontal strips and filling with soil mixture* (GSHS) adiciona el relleno de tierra en la parte interna del muro de bahareque. En los modelos GS, GSH y GSHS, los daños estructurales se concentraron principalmente en las uniones, evidenciándose la expulsión repetitiva de los clavos, el levantamiento o fisuración de la solera inferior y el desprendimiento de los parales y diagonales de su eje. Adicionalmente, el modelo GSHS presentó fisuras transversales en el relleno de tierra y una visible separación o desprendimiento del relleno respecto al esqueleto de guadua.

Figura 5 Prototipos de muros en bahareque tipos GS, GHS y GSHS



Nota. Fuente: (Cristancho, 2024).

Posteriormente, la investigación publicada por Villalba-Morales et al. (2025) avanzó en la formulación de los primeros modelos de elementos finitos inelásticos tridimensionales de gran complejidad geométrica. Las simulaciones, realizadas con el software ANSYS, se ejecutaron mediante un análisis no lineal. Para las uniones, se simuló un modelo de daño progresivo basado en el criterio de Puck para elementos compuestos. Para representar el relleno de tierra, se optó por una simplificación utilizando elementos tipo resorte (*springs*) conectados en las uniones de los miembros verticales e inclinados, junto con una masa concentrada en el centro de cada panel. Para las diagonales y los apoyos en la base se formularon funciones no lineales para la modelación.

2.5.2 Limitaciones de modelos no-lineales y selección de modelo elástico

Aunque los modelos numéricos mostrados por Villalba-Morales et al. (2025) logran predecir con precisión la rigidez inicial de los muros, presentan deficiencias para reproducir los fenómenos de degradación histerética en los ciclos superiores de carga. Esta limitación radica en la complejidad matemática para simular los mecanismos de desconexión y reconexión progresiva de las uniones clavadas durante los ciclos de carga. Debido a la incapacidad de capturar este espectro de daño, lo cual introduce estas variables al su diseño estructural, el trabajo concluye que se requeriría la implementación de resortes no lineales calibrados mediante ensayos físicos de extracción directa y modelos de fractura avanzados para la matriz de relleno; evidenciando las dificultades metodológicas de las aproximaciones puramente no lineales.

Reconociendo estas limitaciones metodológicas, como también la necesidad de realizar el análisis paramétrico del biodeterioro en los elementos en guadua, la presente investigación opta por un enfoque numérico de simulación lineal. Se hará uso de modelos elásticos calibrados con las rigideces secantes equivalentes (basado en el EEEP de la ASTM E2126-11). Esta simplificación metodológica garantiza una estabilidad convergente de los modelos estructurales y habilita la integración del Hipercubo Latino (LHS) para evaluar estocásticamente la vulnerabilidad estructural causado por el biodeterioro en los elementos de guadua en los muros de bahareque.

3 METODOLOGÍA DE MODELACIÓN PARA CALIBRACIÓN Y ANÁLISIS PARAMÉTRICO

3.1 Metodología computacional para calibración

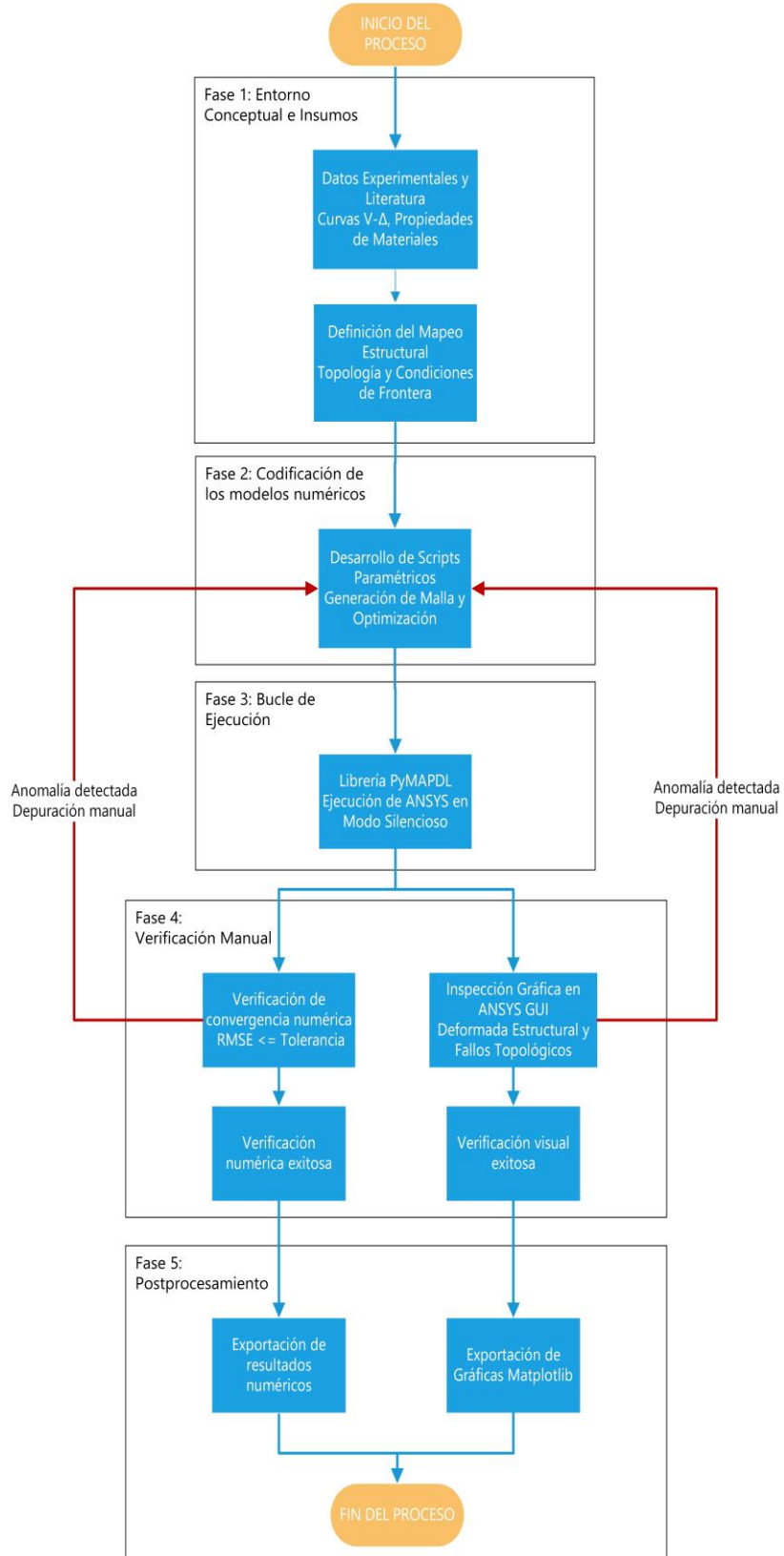
El desarrollo de los modelos numéricos no se realizó utilizando la Interfaz Gráfica de Usuario (GUI) tradicional de ANSYS. En su lugar, se implementó una planificación algorítmica mediante el lenguaje de programación Python y su librería para el control de ANSYS, PyMAPDL. Bajo este esquema, Python actúa como el orquestador principal que controla la creación topológica, la inyección de parámetros y los bucles de optimización, mientras que ANSYS MAPDL opera estrictamente como el motor de cálculo (*solver*).

Para garantizar la consistencia dimensional en la codificación de los scripts en Python, para su posterior ejecución en el motor de cálculo de ANSYS, los modelos se construyeron usando el Sistema Internacional (SI) básico (Fuerza en Newtons [N], Longitud en metros [m] y Esfuerzos/Módulos en Pascales [Pa]). Sin embargo, por conveniencia ingenieril, los resultados y variables de entrada se presentan en este documento utilizando sus múltiplos equivalentes (kN, mm, MPa).

Para alcanzar el primer objetivo específico de esta investigación, el entorno de codificación y la ejecución de los modelos numéricos se estructuraron en un flujo de trabajo compuesto por cinco fases principales, tal como se ilustra en la Figura 6. La Fase 1 establece la extracción de los parámetros a partir de los datos experimentales (datos crudos de las curvas de histéresis de los ensayos de laboratorio) y propiedades de los materiales extraídos del trabajo de grado y literatura; para definir el mapeo estructural, incluyendo la topología y las condiciones de frontera de los modelos.

En la Fase 2, se configura el entorno de codificación mediante el desarrollo de scripts paramétricos encargados de generar la malla geométrica y la optimización de los parámetros a calibrar. Posteriormente, la Fase 3 comprende el bucle de ejecución, donde las funciones de la librería PyMAPDL opera a ANSYS en modo silencioso (*batch mode*), exportando iterativamente tanto los resultados numéricos como los archivos de los modelos en formato binario (.db).

Figura 6 Flujo de trabajo y arquitectura del entorno computacional para la calibración elástica



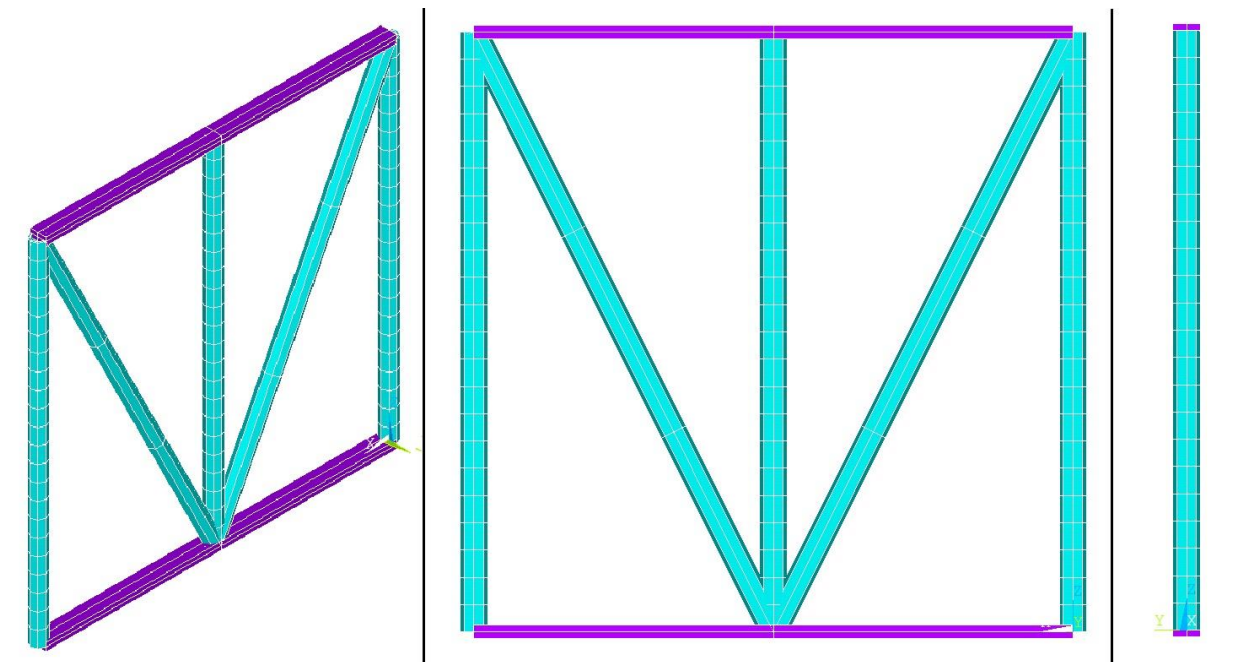
Como se ilustra en la Figura 6, la fase 4 es crítica e involucra una verificación bimodal: por un lado, se realiza una comprobación numérica para asegurar que la convergencia del error (RMSE) sea menor a la tolerancia establecida; y por otro, se realiza una inspección visual de los modelos en formato .db directamente en la GUI de ANSYS, para validar la coherencia de la deformación estructural de los modelos de muros de bahareque y descartar fallos topológicos. Si se descubre alguna anomalía geométrica o numérica, el proceso retorna a la Fase 2 para la depuración manual del código. Finalmente, tras superar la verificación, la Fase 5 abarca el post-procesamiento, consolidando la información de salida en tablas de resultados y gráficas estructuradas.

3.2 Definición geométrica y condiciones de contorno del muro de bahareque

3.2.1 Dimensiones, topología de nodos y mallado

La geometría del muro fue generada mediante una matriz nodal paramétrica. Los elementos estructurales principales (postes de guadua, diagonales y soleras de madera) fueron modelados con elementos tipo BEAM188, capaces de capturar deformaciones por flexión y cortante.

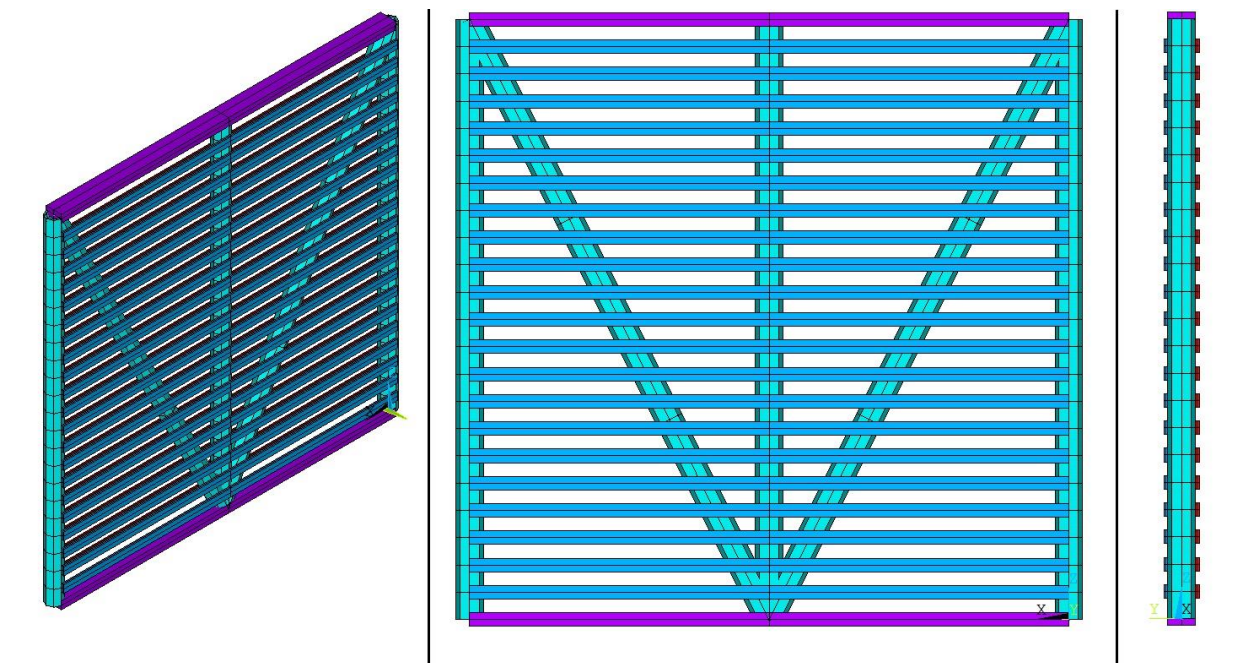
Figura 7 Modelación en ANSYS del prototipo GS para calibración elástica



El modelo GS (*Guadua Skeleton*), la cual se puede observar en la figura 7, presenta una configuración geométrica de 2.2 m de ancho por 2.2 m de alto. Su topología estructural se compone de 3 paralelas y 2 diagonales fabricadas en guadua con un diámetro aproximado de 10 cm, anclados a una solera superior e inferior de madera aserrada de 5 cm de altura y 10 cm ancho. La principal característica de este prototipo es que consiste en un esqueleto desnudo, ya que no incluye recubrimiento con latas de guadua ni relleno de tierra.

Con el propósito de viabilizar la metodología de biodeterioro estocástico planteada para la Fase 2, la topología de los postes y las diagonales de guadua no se definió como elementos continuos desde la base hasta la cima; por el contrario, fueron subdivididos. En el caso particular de las diagonales, se ejecutó una rotura nodal en tercios, permitiendo aislar la fracción inferior para su posterior degradación.

Figura 8 Modelación en ANSYS del prototipo GHS para calibración elástica

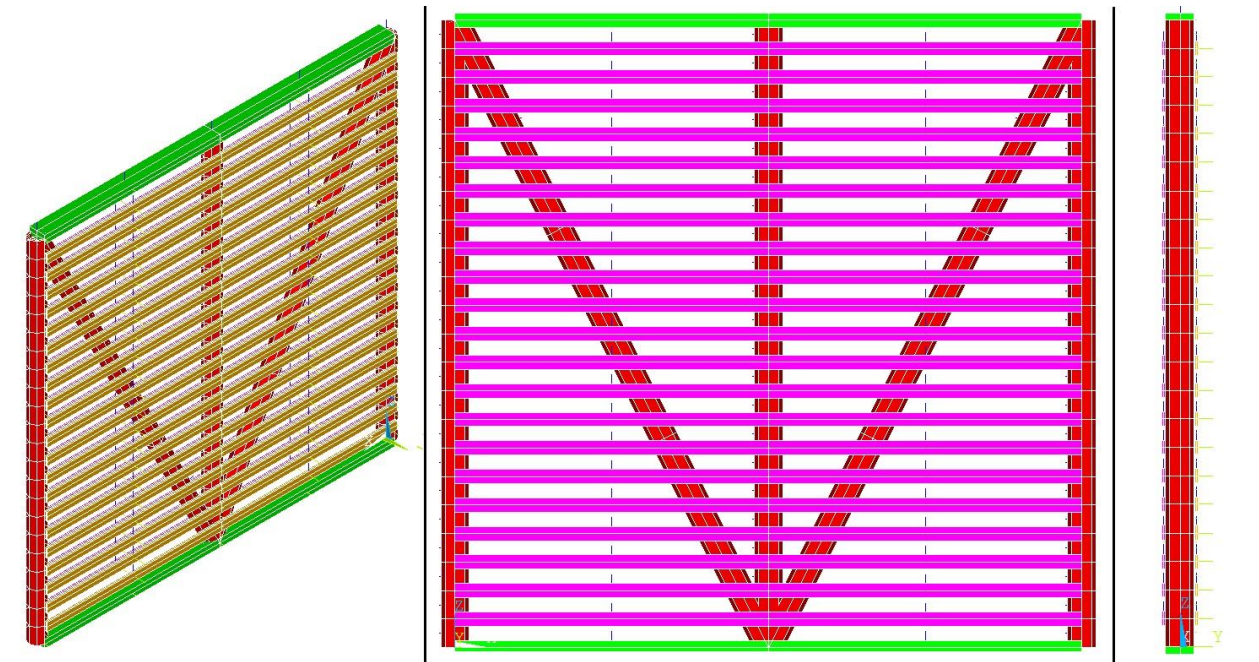


El modelo GHS (*Guadua Skeleton with Horizontal Strips*) comparte la base geométrica del muro anterior, utilizando un esqueleto principal conformado por paralelas y diagonales construidos íntegramente en guadua (ver Figura 8). Su topología se distingue por la adición de latas (tiras) de guadua ubicadas de forma horizontal, separadas cada 10cm y con dimensiones 5cm ancho por 1.5cm alto, a lo largo de ambas caras del entramado. A pesar de contar con esta matriz de

contención lateral, se caracteriza por ser un muro hueco, sin ningún tipo de relleno de tierra en su interior.

El modelo GSHS (*Guadua Skeleton with Horizontal Strips and Filling with Soil Mixture*) se compone topológicamente con la misma configuración del modelo GHS, siendo su característica distintiva es que funciona como un bahareque tradicional relleno, incorporando en su interior una mezcla de tierra con fibras naturales compactada en capas homogéneas.

Figura 9 Modelación en ANSYS del prototipo GSHS para calibración elástica



3.2.2 Condiciones de frontera y carga gravitacional

A continuación, se definen las condiciones de frontera globales y la aplicación de la carga lateral y gravitacional en los modelos de elementos finitos codificados en Python y ejecutados en ANSYS:

- Condiciones de contorno globales: Se asignó un empotramiento perfecto en los nodos de la solera inferior (S_BASE) de manera transversal para los tres modelos (GS, GHS, GSHS). Adicionalmente, en el modelo GSHS, los resortes 1D de Winkler vinculados a los nodos de anclaje de la matriz de tierra (ANCHOR_NODES) se restringieron estrictamente en UX (lateral) y UZ (axial); la aplicación de restricciones en UY o en los grados

rotacionales sobre estos resortes fue omitida explícitamente para evitar inducir una sobre-rigidez artificial en el sistema.

- Cargas Lateral y de Control: La sollicitación lateral fue aplicada como una fuerza puntual horizontal distribuida ($FX = V/3$) sobre los tres nodos de la solera superior (S_TOP) ubicados a la cota $Z = 2.20$ m. Adicionalmente, el desplazamiento objetivo utilizado para la calibración se leyó promediando el grado de libertad UX de los postes a una altura de control de $Z = 2.10$ m.
- Gravedad: El peso propio del muro se indujo mediante una aceleración vertical positiva de 9.81 m/s^2 . La inicialización de la gravedad (Load Step 1) se ejecutó con el comando NLGEOM, ON para capturar correctamente la rigidización por tensión (*stress-stiffening*). Posteriormente, para la etapa de carga lateral estática equivalente (Load Step 2), se configuró NLGEOM, OFF para forzar la convergencia hacia la metodología secante lineal. Dado que la respuesta estudiada es la deflexión lateral neta, los desplazamientos causados por la gravedad fueron aislados cinemáticamente mediante la sustracción vectorial de los casos de carga (Load Case Operation - LCOPER) con la operación LC2 - LC1.

El proceso de calibración iterativa se programó incorporando una simplificación computacional estricta (Bypass Computacional) para acelerar los bucles de optimización del algoritmo `scipy.minimize_scalar`. Mientras que el modelo de validación geométrica base simula la gravedad y extrae la deflexión lateral neta mediante la sustracción vectorial de los casos de carga (LCOPER), los scripts de optimización iterativa omiten el vector de carga gravitacional por completo. La justificación mecánica de esta omisión se fundamenta en que la calibración bajo el método EEEP opera exclusivamente en el régimen elástico lineal, con las no-linealidades geométricas desactivadas (NLGEOM, OFF).

Bajo estas fronteras, la matriz de rigidez global del sistema es constante y rige el Principio de Superposición elástica. Consecuentemente, al aplicar de forma exclusiva los vectores de fuerza lateral sobre el pórtico, el motor de cálculo entrega de manera directa el desplazamiento neto asociado a dicha sollicitación. Esta simplificación algorítmica reduce la resolución matricial en un 50% por cada iteración evaluada, eliminando el costo computacional de simular el peso propio y ejecutar la sustracción en el post-procesador, manteniendo intacta la exactitud del módulo secante objetivo.

Figura 10 Implementación algorítmica del Principio de Superposición y aislamiento cinemático mediante LCOPER

```
# --- Load Step 1: Gravedad (Stress-Stiffening) ---
mapdl.nlgeom("ON")
mapdl.acel(0, 9.81, 0)
mapdl.solve() # Almacenado como LC1

# --- Load Step 2: Sollicitación Lateral Secante ---
mapdl.nlgeom("OFF") # Fuerza el régimen lineal EEEP
mapdl.f("S_TOP", "FX", V/3)
mapdl.solve() # Almacenado como LC2

# --- Aislamiento Cinemático (Sustracción LCOPER) ---
mapdl.lcdef(1, 1)
mapdl.lcdef(2, 2)
mapdl.lcoper("SUB", 1) # Resultado neto = LC2 - LC1
```

Nota. Elaboración propia en lenguaje Python utilizando la librería PyMAPDL.

3.3 Asignación de propiedades constitutivas

3.3.1 Propiedades constitutivas de los materiales base

Los componentes estructurales adoptaron propiedades lineales isotrópicas basadas en caracterizaciones reportadas en la literatura y pruebas de laboratorio:

Tabla 1 Propiedades físicas y mecánicas de los materiales implementados en el modelo numérico

Material	Propiedad	Símbolo	Valor	Unidad	Fuente / Justificación
Matriz de Tierra Reforzada	Módulo de elasticidad	E	29	MPa	Comunicación personal (J. Villalba) / (Cristancho, 2024)
	Relación de Poisson	ν	0.25	-	(Guerrero et al., 2026) y (Nabouch, 2018), redondeado de 0.23
	Densidad seca	ρ	1441	kg/m ³	Ensayos de laboratorio (Cristancho, 2024)
Guadua angustifolia	Módulo de elasticidad	E	9.3	GPa	(Cristancho, 2024)
	Relación de Poisson	ν	0.35	-	(Villalba-Morales et al., 2025)
	Densidad	ρ	508.3	kg/m ³	(Cristancho, 2024)
Madera Aserrada (Soleras)	Módulo de elasticidad	E	5.0	GPa	Comunicación personal (J. Villalba) / (Cristancho, 2024)
	Relación de Poisson	ν	0.20	-	(Villalba-Morales et al., 2025)
	Densidad	ρ	600	kg/m ³	NSR-10, Tabla B.3.2-1 (Asociación Colombiana de Ingeniería Sísmica, 2010)

Nota. Las propiedades etiquetadas como comunicación personal derivan de datos experimentales estáticos suministrados para la parametrización de este modelo. Las propiedades sin unidad de medida corresponden a coeficientes adimensionales.

3.3.2 Metodología EEEP

Investigaciones previas sobre el comportamiento de marcos de bahareque (Villalba-Morales et al., 2025) han intentado capturar la disipación de energía mediante modelos de daño no lineal. Sin embargo, dichos enfoques presentaron ciertas incapacidades numéricas en modelos de elementos finitos para representar la física de los ensayos de laboratorio realizados en la investigación de (Cristancho, 2024). Por lo tanto, el presente modelo descartó definitivamente cualquier formulación no-lineal.

Como alternativa metodológica para poder hacer el análisis paramétrico a múltiples escenarios de daño, se optó por la linealización basada en el concepto de Rigidez Secante Equivalente, formalizada a través del criterio *Equivalent Energy Elastic-Plastic (EEEP)* dictaminado por la norma ASTM E2126 (ASTM International, 2011). Este principio establece que la curva no lineal

real de fuerza-desplazamiento de un sistema estructural que entra en fluencia puede aproximarse mediante un modelo bilineal equivalente que encierre la misma cantidad de energía de deformación, estableciendo un límite de fluencia teórico y una rigidez secante efectiva.

Para nuestros modelos numéricos de elementos finitos, esto implica que la topología puede modelarse en el rango elástico lineal, capturando la rigidez cortante elástica y evitando la integración temporal inelástica. Para lograrlo, la respuesta global se discretizó concentrando la deformabilidad en elementos de resorte lineal unidimensional (COMBIN14). La constante constitutiva de rigidez de estos conectores se calibró utilizando la rigidez elástica evaluada a partir de los datos experimentales.

Los valores objetivos de calibración numérica fueron extraídos directamente de los datos crudos de las curvas de histéresis reportadas en los ensayos de laboratorio a escala natural de (Cristancho, 2024). Para los modelos GHS y GSHS, se identificó el umbral correspondiente a $0.4V_{peak}$ a partir de la totalidad de los datos experimentales, extrayendo su respectivo desplazamiento lateral para calcular la pendiente secante. A partir de esta pendiente constante, trazada desde el origen (0,0) hasta el punto límite de $0.4V_{peak}$, se extrajeron escalonadamente cinco puntos de control de fuerzas y desplazamientos equivalentes.

Por otro lado, para el modelo del pórtico simple desnudo GS, la metodología aplicada fue similar, con la salvedad de que el valor límite para la extracción de la pendiente se estableció de forma controlada en el registro de la fuerza obtenida previo a alcanzar 1.0 mm de desplazamiento lateral elástico. Esta aproximación se encuentra respaldada metodológicamente en la literatura especializada. Al respecto, diversos estudios coinciden en que los sistemas de adobe y bahareque presentan un comportamiento lineal para desplazamientos inferiores a 1 mm, una respuesta estructural que se evidencia incluso al implementar modelaciones no lineales (García-Troncoso et al., 2026; Rodríguez & Pallares, 2009).

Tabla 2 *Coordenadas de fuerza y desplazamiento proyectadas para la calibración secante (EEEP)*

Modelo	Paso de Carga	Fuerza V (kN)	Desplazamiento Δ (mm)
GS	1	0.068	0.200
	2	0.135	0.400
	3	0.203	0.600
	4	0.271	0.800
	5	0.339	1.000
GHS	1	0.535	1.587
	2	1.070	3.173
	3	1.605	4.760
	4	2.140	6.347
	5	2.675	7.934
GSHS	1	0.600	1.575
	2	1.199	3.151
	3	1.799	4.726
	4	2.398	6.301
	5	2.998	7.876

Nota. Elaboración propia con base en el procesamiento analítico de las curvas de histéresis in-situ reportadas en los ensayos de Cristancho, (2024).

3.4 Topología de resortes lineales COMBIN14 y segregación por REAL ID

Para la modelación de las interfaces estructurales entre postes, diagonales y soleras, se descartó la fusión rígida tradicional del pórtico en favor de una topología híbrida de acoplamiento. En cada intersección, se generaron nodos geoméricamente coincidentes pero independientes, asegurando el desacople cinemático inicial. La estabilidad espacial de las uniones se garantizó mediante acoplamientos nodales (CP) estructurados para evitar la rigidez parásita, mientras que la transferencia de carga y deformabilidad en el plano se gobernó instanciando elementos de resorte lineal unidimensional (COMBIN14) orientados exclusivamente en el grado de libertad longitudinal (UX). Esta arquitectura aísla el deslizamiento relativo entre los componentes, subordinándolo directamente a la rigidez secante calibrada de las conexiones de guadua (k_e). La Tabla 3 sintetiza las restricciones asignadas a cada componente.

Tabla 3 *Resumen de restricciones cinemáticas y grados de libertad por componente*

Elemento / Interfaz	Tipo de Restricción	Grados de Libertad Acoplados / Fijos	Grados Liberados / Resorte
Base del muro (S_BASE)	Empotramiento global	UX, UY, UZ, ROTX, ROTY, ROTZ	Ninguno
Esqueleto principal	Acoplamiento Nodal (CP)	UY, UZ, ROTX, ROTY, ROTZ	UX (Resorte COMBIN14)
Esterilla (Latas)	Rótulas (CP)	UY, UZ, ROTX	UX, ROTY, ROTZ
Nodos de anclaje Winkler	Restricción lateral/axial	UX, UZ	UY, ROTX, ROTY, ROTZ

Nota. Elaboración propia. Los grados liberados en la dirección de carga (UX) son gobernados exclusivamente por la rigidez secante equivalente de las conexiones (k_e).

3.4.1 Conexiones lata-poste

Para implementar el comportamiento elástico en los modelos GHS y GSHS, la continuity rígida en las intersecciones lata-poste fue suprimida. A partir de la generación de nodos geoméricamente coincidentes (cuyo desfase volumétrico físico es gobernado exclusivamente por la excentricidad de la sección transversal paramétrica vía SECOFFSET), se aislaron cinemáticamente los componentes. Se mitigaron los efectos de sobre-rigidez tipo Vierendeel aplicando acoplamientos restrictivos (CP) únicamente en los grados de libertad UY, UZ y ROTX. Esto permitió liberar las rotaciones ROTY y ROTZ para que operaran como verdaderas rótulas articuladas, mientras que el grado traslacional longitudinal en el plano (UX) fue gobernado de forma independiente mediante elementos de resorte elástico lineal 1D (COMBIN14). La constante de rigidez asignada a estos resortes representa el módulo de deslizamiento secante agrupado (k_e) del conector experimental.

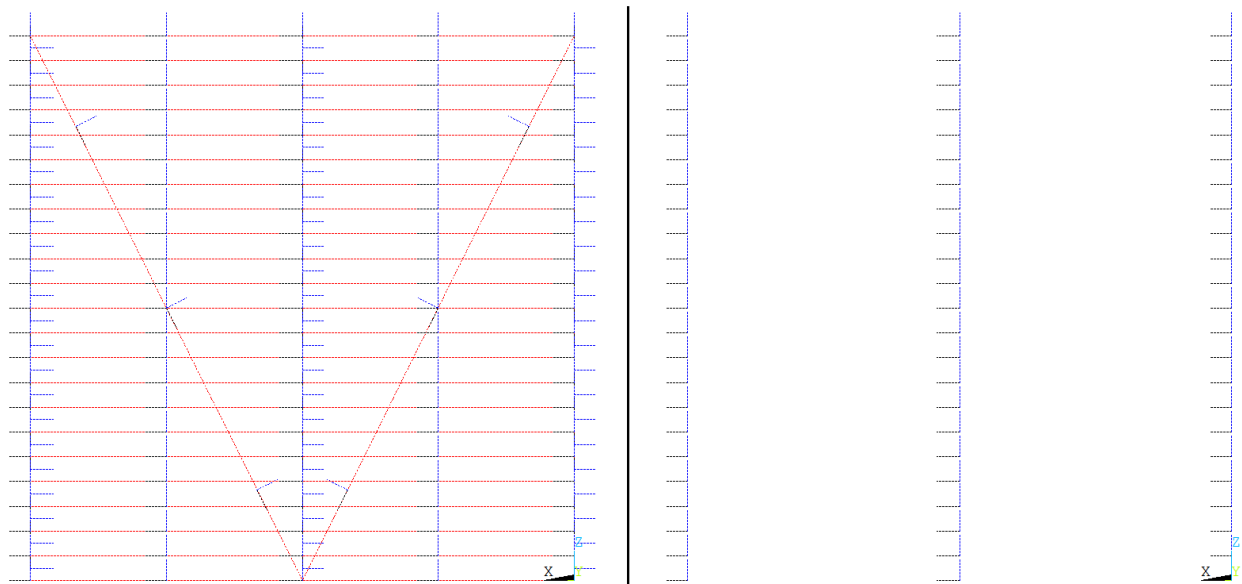
3.4.2 Interacción Suelo-Estructura mediante Lecho Elástico de Winkler

De forma análoga, para el modelo GSHS que incluye el relleno de tierra, la matriz continua de elementos finitos volumétricos (SOLID185) fue descartada a favor de una cama de resortes tipo Winkler discretos. Se utilizaron elementos COMBIN14 segregados por identificadores (REAL ID 2 y 5) para gobernar el confinamiento del suelo (k_s) y la adherencia axial al poste (k_{bond}), logrando

paridad cinemática total con los modelos tipo pórtico y evitando el sobredimensionamiento de la matriz de rigidez.

Para garantizar la estabilidad matemática de los elementos COMBIN14 que simulan el relleno de tierra (lecho de Winkler y adherencia axial) previo a la aplicación de las restricciones, se implementó una lógica de desfase nodal paramétrico. Los nodos de anclaje fueron generados con un delta de separación geométrica de 1×10^{-4} m respecto al plano estructural base. Esta longitud física microscópica, aunque imperceptible a nivel macroestructural, es un requisito algorítmico ineludible para que el motor de cálculo pueda ensamblar la matriz direccional del resorte sin generar singularidades. Las condiciones de frontera finales aplicadas reflejan estrictamente el montaje físico del laboratorio.

Figura 11 Elementos COMBIN14 (interacción suelo-estructura) para el modelo GSHS



Nota. Se separan los resortes tipo COMBIN14 en la imagen de la derecha.

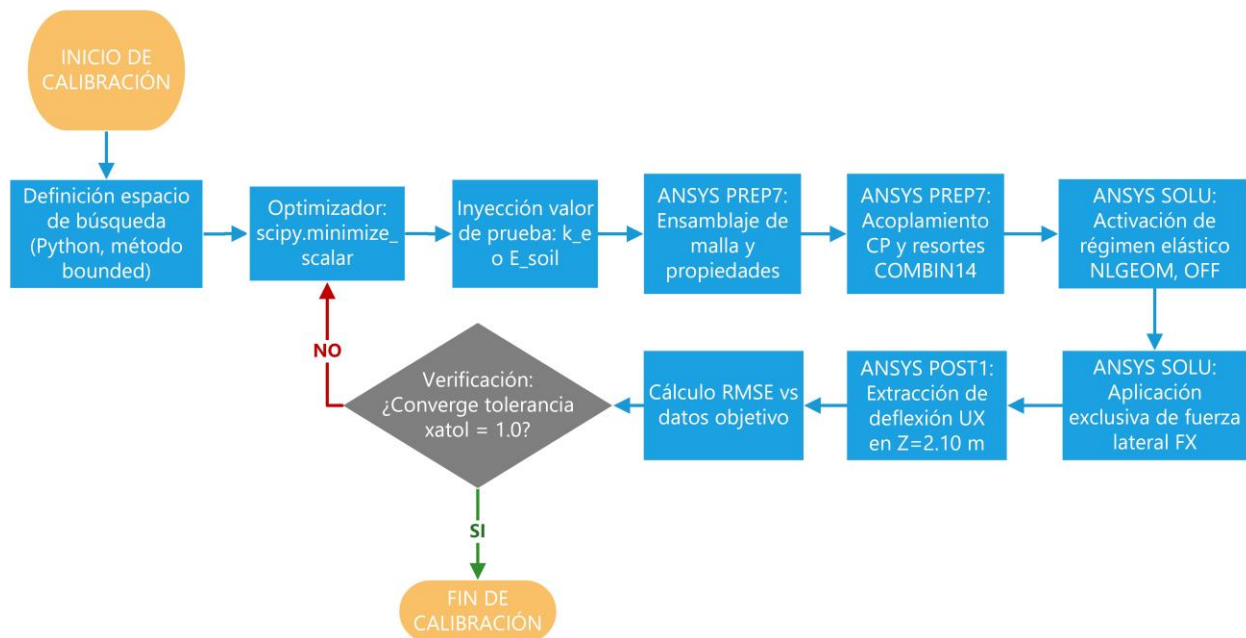
3.5 Calibración elástica de los modelos numéricos

3.5.1 Estrategia de calibración

La estrategia de optimización algorítmica general consistió en utilizar la función `minimize_scalar` de la librería `scipy` configurada bajo el método `Bounded` (Limitado) con una tolerancia de convergencia absoluta `xatol = 1.0`. Esta función inyecta iterativamente valores

paramétricos de prueba a la rigidez de deslizamiento de las conexiones de guadua k_e para modelos GS y GHS, o el módulo de elasticidad del suelo E_{soil} para modelo GSHS, en la topología de resortes de ANSYS. En cada iteración, el algoritmo mide la desviación de la deflexión lateral teórica (extraída en la cota $Z = 2.10$ m) contra los valores experimentales de desplazamiento lateral definidos en la tabla 3. La convergencia óptima se alcanza al minimizar la raíz del error cuadrático medio (RMSE). Los espacios de búsqueda acotados numéricamente y los límites máximos de desplazamiento lateral evaluados varían para cada modelo (GS, GHS, GSHS) dependiendo de su respectivo régimen de proporcionalidad, garantizando que el motor de cálculo opere estrictamente en el rango elástico.

Figura 12 Flujo algorítmico del proceso de calibración iterativa con funciones de PyMAPDL



Nota. Fuente: Elaboración propia.

Tabla 4 Arquitectura de scripts Python para la calibración elástica

Script	Función Principal	Condiciones de Frontera y Carga	Calibración Objetivo
bahareque_base_model.py	Construcción de la matriz geométrica base, validación topológica NUMMRG y prueba gravitacional.	Empotramiento base. Prueba gravitacional aislada usando sustracción de vectores LCOPER.	N/A (Validación geométrica)
pymapdl_macro_connections_v6.py	Macro invocable para la inyección de la cama de resortes Winkler y acoplamientos lata-poste.	Desacople cinemático y fijación en ANCHOR_NODES.	N/A (Macro topológica)
calibration_GS_v3.py	Calibración del módulo de deslizamiento del pórtico estructural desnudo (Stage C).	FX aplicada en S_TOP (V/3). Empotramiento S_BASE.	Optimiza k_e . Objetivo: 1.0 mm
calibration_GHS_v7.py	Calibración del módulo de deslizamiento global incluyendo las latas de bambú.	FX aplicada en S_TOP (V/3). Empotramiento S_BASE.	Optimiza k_e . Objetivo: 7.93 mm
calibration_GSHS_v6.py	Calibración del módulo elástico de la tierra armada E_{soil} .	FX aplicada en S_TOP. Empotramiento S_BASE y fijación adicional en ANCHOR_NODES.	Optimiza E_{soil} asumiendo k_e fijo. Objetivo: 7.87 mm

3.6 Metodología Probabilística de Biodeterioro

Para establecer una metodología probabilística en los muros de bahareque influenciando el biodeterioro en los elementos de guadua requiere integrar la aleatoriedad natural del daño en el modelo numérico. Como se discutió en el Capítulo 2, los materiales lignocelulósicos como la *Guadua angustifolia* no se degradan de forma homogénea en toda la estructura, sino que exhiben una variabilidad dictada por condiciones higrotérmicas locales, exposición y actividad xilófaga. Por lo tanto, se hace indispensable realizar un análisis probabilístico y paramétrico. Para solventar el elevado costo computacional que demandaría una simulación pura por Monte Carlo, la presente metodología adopta el Muestreo por Hipercubo Latino (LHS, por sus siglas en inglés), permitiendo un muestreo estratificado denso y representativo que inyecta los escenarios patológicos directamente en la topología de los elementos finitos.

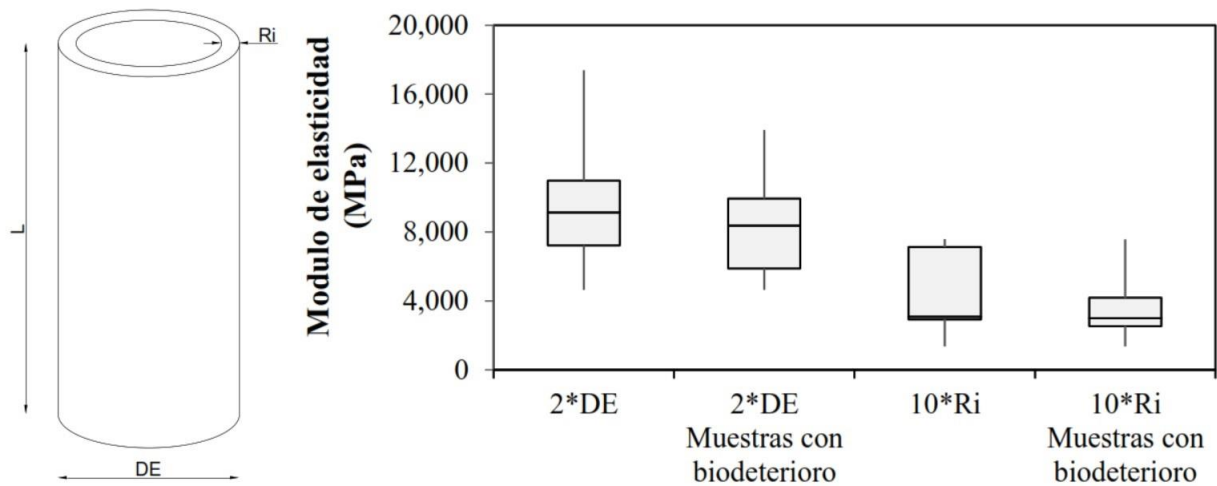
3.7 Caracterización estadística del biodeterioro de la Guadua

En este apartado, se describirán los datos y parámetros estocásticos para poder realizar el análisis paramétrico del daño causado por el biodeterioro.

3.7.1 Base experimental: muestras 2·DE

La cuantificación paramétrica del daño por biodeterioro se extrae estrictamente del trabajo experimental de (Cristancho, 2024), específicamente de los ensayos realizados sobre el grupo de especímenes con longitud igual a “2·DE”. Las pruebas de laboratorio sobre este grupo de guadua con biodeterioro (N=8) establecieron una media para el módulo de elasticidad paralela a sus fibras de $\mu = 8404.44$ MPa, con una desviación estándar de $\sigma = 3075.02$ MPa. Este conjunto de datos estadísticos representa el estado degradado de la guadua en la matriz estructural, contrastando con el estado base saludable calibrado en el capítulo 3, cuyo módulo elástico se definió de forma fija en $EX_{base} = 9300$ MPa.

Figura 13 Esquema de guadua y distribución de módulo de elasticidad



Nota. Fuente: (Cristancho, 2024).

3.7.2 Distribución Normal Truncada

Para la configuración estocástica de las propiedades mecánicas dentro del bucle LHS, se debe prevenir la generación de valores físicamente imposibles. Si se aplicara una campana de Gauss estándar sobre los datos experimentales, la desviación estándar superior podría generar iteraciones

con módulos de elasticidad que superarían el estado sano (> 9300 MPa), lo que implicaría un fortalecimiento estructural ficticio. Por tal motivo, se implementó matemáticamente una Distribución Normal Truncada acotada entre 0 y $EX_{base} = 9300$ MPa, definida a través de los límites estandarizados $a = (0 - \mu)/\sigma$ y $b = (9300 - \mu)/\sigma$. Esto garantiza que el módulo elástico aleatorio (EX_{rand}) extraído en cada iteración represente exclusivamente una fracción de daño válida.

A nivel algorítmico, esta restricción matemática se codificó utilizando la función `scipy.stats.truncnorm` en sinergia con el generador espacial `scipy.stats.qmc` de Python. El controlador toma los parámetros estandarizados y, mediante la *Función de Punto Porcentual* (PPF), mapea las probabilidades uniformes generadas por el algoritmo LHS hacia el dominio físico del material. Esto permite pre-calcular una matriz estocástica de N iteraciones, donde cada ciclo provee un set único e independiente de valores EX_{rand} y su respectivo $k_{e,rand}$ acoplado, garantizando que el motor de ANSYS reciba exclusivamente datos de daño validados antes de iniciar el cálculo matricial

3.7.3 Factor de daño acoplado

El biodeterioro no se limita a reducir la rigidez axial de los miembros de guadua, altera drásticamente la capacidad de retención y la fricción local en las uniones clavadas; debido a que se reduce la densidad del material y su integridad estructural, el comportamiento de la unión se ve directamente afectado. Para capturar este fenómeno, se formuló un acoplamiento cinemático de daño. En el código, se calcula un Factor de Daño adimensional (D) por cada elemento degradado, expresado como $D = EX_{rand}/EX_{base}$, estando estrictamente acotado en el intervalo $0 < D \leq 1.0$.

De manera simultánea a la reducción del módulo de elasticidad de los elementos de guadua en ANSYS (BEAM188), este factor de daño penaliza de forma directamente proporcional la constante de deslizamiento del conector asociado (COMBIN14), redefiniendo su rigidez secante aleatoria como $k_{e,rand} = opt_{ke} \times D$. Esta simplificación asegura que el daño global de la estructura nazca del debilitamiento simultáneo del material y sus uniones, previniendo incoherencias cinemáticas.

3.8 Definición de zonas de daño y escenarios de biodeterioro

En esta sección del documento, se definen cuales elementos de los modelos serán afectados por el biodeterioro para ejecutar el análisis paramétrico.

3.8.1 Jerarquía de vulnerabilidad por biodeterioro

El ataque biológico al tener propiedades físicas distintas a la dirección en que se mida, la probabilidad de biodeterioro varía según la exposición ambiental, las trampas de humedad constructivas y la capilaridad natural del material. La literatura actual para estructuras de guadua, madera y bahareque, no ha relacionado porcentajes de daño medidos en campo, por lo que esta investigación establece conservadoramente los porcentajes de daño para las zonas críticas del muro en bahareque no cementado.

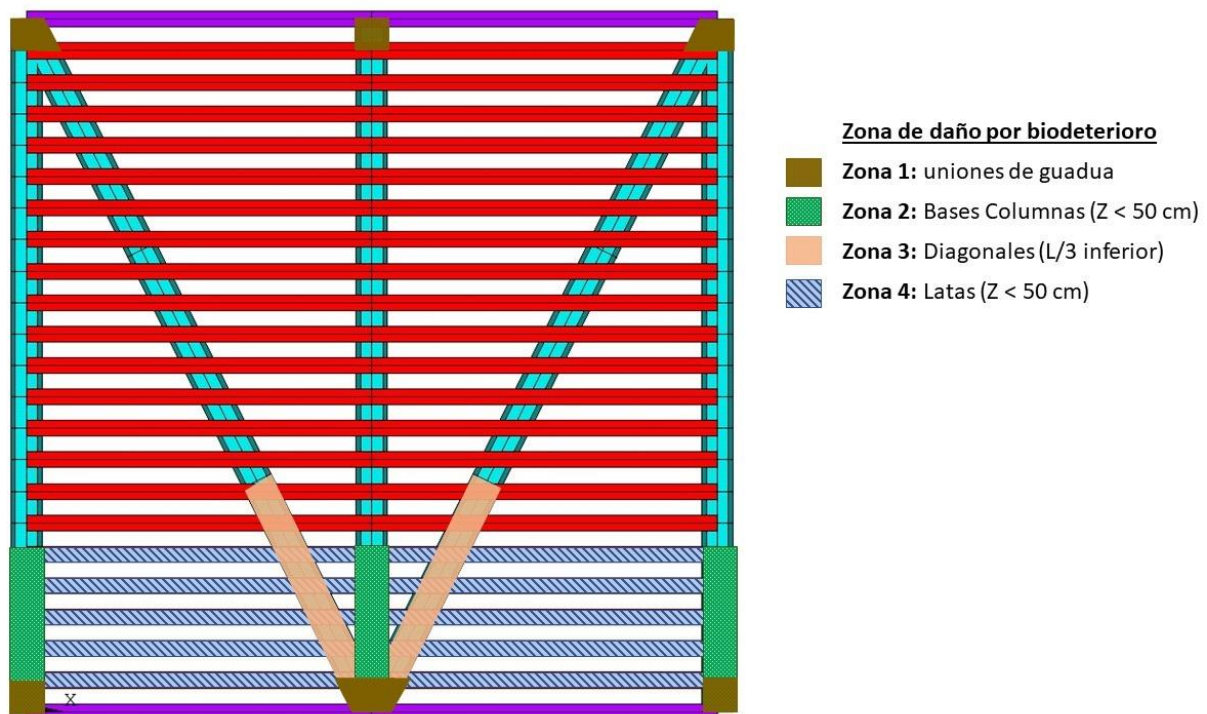
La Zona de Riesgo 1, las uniones entre elementos del pórtico en guadua, al ser fundamentales en el desempeño estructural y el desprendimiento entre postes y soleras se cataloga como afectación severa a la seguridad en estructuras en bahareque, se establece un rango de incidencia al daño entre el 45% al 70% (Asociación Colombiana de Ingeniería Sísmica - AIS, 2002; Mite-Anastacio et al., 2022). El biodeterioro causado por insectos, hongos y la humedad atrapada internamente, ensancha las micro fisuras, conduciendo a un biodeterioro localizado y generando fallas en las conexiones (Herrera & Takeuchi, 2009; International Network for Bamboo and Rattan, 2016).

La Zona de Riesgo 2, las bases de las columnas (Postes), posee naturalmente en sus primeros 0.50 m de altura un contenido de humedad mayor que el resto de las de guadua, convirtiéndola en la región más propensa a la colonización de hongos e insectos (Mendez et al., 2022; Mite-Anastacio et al., 2022). La literatura propone evitar el contacto de los postes con el suelo y el ascenso capilar basal de la humedad, para combatir el biodeterioro causado por los ataques de termitas y escarabajos xilófagos; de lo contrario, su exposición a los anteriores podría reducir su vida útil a 6 meses (International Network for Bamboo and Rattan, 2016). Por lo anterior, se establece un rango de incidencia al daño entre el 35% al 60%

Se identifica la Zona de Riesgo 3, localizada en el sector inferior de las diagonales, con una asignación de afectación por biodeterioro entre 20% y 40% debido a la acumulación de humedad

por escorrentía gravitacional en el tercio inferior y la afectación a la seguridad por su falla (Asociación Colombiana de Ingeniería Sísmica - AIS, 2002; Mite-Anastacio et al., 2022). Se cataloga como Zona de Riesgo 4, el sector de los primeros 0.5 m desde el suelo donde se encuentran las latas (esterilla) el cual es solo aplicable para modelos GHS y GSHS; allí se evidencia biodeterioro por absorción por capilaridad en los muros, asignándoseles un rango de daño entre 15% y 35% (International Network for Bamboo and Rattan, 2016).

Figura 14 Distribución de zonas de daño por biodeterioro en muros de bahareque



Nota. Fuente: Elaboración propia. Se usa modelo GHS para la ilustración; la zona 4 no aplica para modelo GS.

Es importante señalar que las soleras inferiores, al ser de madera aserrada y no de guadua, poseen una fisiología y respuesta al deterioro diferente, por lo que quedan excluidas de este análisis paramétrico.

3.8.2 Escenarios de daño y lógica de activación condicional

Para evitar el enmascaramiento estadístico y comprender la influencia cinemática de cada componente degradado en el sistema, la metodología estocástica se fragmentó en escenarios

paramétricos aislados, permitiendo realizar un análisis de sensibilidad preciso. Se definieron los siguientes escenarios de ejecución independientes:

Tabla 5 Definición de escenarios paramétricos y rangos de daño por biodeterioro

Escenario	Modo de activación	Descripción de la zona	Rango de daño por biodeterioro
A	Exclusiva	Zona 1 (uniones del portico)	45% - 70%
B	Exclusiva	Zona 2 (Bases de columnas < 50 cm)	35% - 60%
C	Exclusiva	Zona 3 (L/3 inferior de diagonales)	20% - 40%
D	Exclusiva	Zona 4 (Latas < 50 cm, para GHS y GSHS)	15% - 35%
E	Global	Zonas 1, 2, 3 y 4 combinadas	Combinación de rangos previos

Nota. Elaboración propia. Los rangos de daño se usan como parámetros dentro de la distribución Normal Truncada en cada iteración del LHS.

Durante la ejecución de un escenario individual, el muestreo aleatorio actúa únicamente sobre la zona objetivo. Todos los elementos estructurales fuera de dicha zona son bloqueados rígidamente en su estado sano base ($D = 1.0$), impidiendo que se modifiquen sus propiedades materiales en los modelos de ANSYS.

3.9 Selección e implementación de Muestreo de Hipercubo Latino (LHS)

Para garantizar la validez estadística del análisis paramétrico sin incurrir en costos computacionales prohibitivos, la presente investigación sustituyó los métodos tradicionales como el método Monte Carlo por el Muestreo de Hipercubo Latino (LHS).

3.9.1 Estratificación matemática y superioridad sobre Monte Carlo

La generación estocástica de parámetros utiliza el Muestreo de Hipercubo Latino (LHS) a través de una distribución Normal Truncada. El método LHS estratifica matemáticamente la función de densidad de probabilidad en intervalos estrictamente equiprobables, forzando la extracción uniforme de valores extremos. Esto garantiza la representación de todo el espectro de

daño mientras neutraliza el cuello de botella computacional intrínseco de los métodos pseudoaleatorios de Monte Carlo.

A diferencia del muestreo aleatorio simple como MonteCarlo, el LHS divide el rango de cada variable en intervalos disjuntos de igual probabilidad, asegurando que se extraiga un valor de cada uno de ellos. Esto proporciona una estratificación densa en todo el rango de cada variable muestreada. El LHS produce estimaciones estadísticamente mucho más estables y robustas. Al generarse la estratificación, el método previene la variabilidad entre distintas simulaciones, produciendo una estimación más estable para la Función de Distribución Acumulativa (CDF) de la que se produce mediante el muestreo aleatorio (Helton and Davis, 2002).

El método de muestreo hipercubo latino LHS está pensado principalmente para su uso con modelos de larga duración, y es particularmente eficaz en análisis de sensibilidad con muestras pequeñas debido a su eficiente estratificación en todo el rango de cada variable incierta (Helton and Davis, 2002). Al estratificar el espacio de probabilidad y obligar a la selección de valores en las colas estadísticas, el LHS elimina la aglomeración de muestras (*clustering*). Para este proyecto, un controlador en Python determinó la cantidad exacta de elementos a degradar (m) en cada iteración utilizando una distribución uniforme entera, acotada por los límites empíricos de cada zona. Esta selección espacial se ejecutó “sin reemplazo” para garantizar que ningún elemento recibiera penalizaciones duplicadas dentro de una misma iteración. Por todas las ventajas expuestas anteriormente, se selecciona el método LHS para nuestro análisis paramétrico.

3.9.2 Test de Convergencia Estadística y Criterio de Parada

La suficiencia del tamaño muestral se definió mediante un criterio heurístico de parada asintótica, conocido como Coeficiente de Variación (COV), ampliamente documentado (Haldar & Mahadevan, 2000). En este estudio, se monitoreó este coeficiente ($COV = \sigma/\mu$) de la deflexión lateral del muro Δ_{TOP} , en la posición $Z = 2.10$ m, acoplando la media y la varianza de los resultados. Cuando el porcentaje de variación del COV acumulado entre iteraciones sucesivas se vuelve marginal, se certifica matemáticamente que la muestra representa la población probabilística sin necesidad de un muestreo infinito.

Mientras que una simulación tradicional de Monte Carlo requeriría típicamente entre 10^3 y 10^4 iteraciones para que el COV se aplane asintóticamente, el LHS actúa como una técnica de

reducción de varianza que acelera drásticamente este proceso, tal como se detalla en el numeral 4.3.1. La codificación en Python de este análisis para cada escenario propuesto validó el diferencial del COV, confirmando empíricamente que la convergencia estadística se alcanzó de manera estable a las $N = 100$ iteraciones, demostrando que este tamaño muestral fue suficiente para capturar la dispersión del daño en la estructura.

3.10 Arquitectura del controlador Python y protocolo de ejecución

El flujo del análisis paramétrico del biodeterioro, se controla externamente, sin comprometer los modelos calibrados en el capítulo 3 de esta investigación, mediante *scripts* escritos en Python utilizando la librería de funciones PyMAPDL; donde Python opera como el director del análisis estadístico que inyecta parámetros en el motor de elementos finitos de ANSYS. El flujo metodológico general, desde la generación de la línea base hasta la cuantificación de la fragilidad, se ilustra en la Figura 19.

Figura 15 Flujo de análisis paramétrico LHS



3.10.1 Scripts maestros

Se construyeron tres orquestadores maestros para cada tipología estructural, uno para cada modelo de muro (GS, GHS, GSHS). Para preservar la pureza de la calibración inicial, los *scripts* LHS jamás construyen geometría nueva. Utilizan un archivo binario prístino (`pristine_baseline.db`) consolidado en la Fase 1.

Para garantizar la estricta sanidad de memoria en el bucle iterativo, el *script* ordena un reinicio completo en la primera línea de cada ciclo estocástico mediante el comando `mapdl.resume("pristine_baseline.db")`. Esto asegura que el daño de la Iteración N jamás se herede residualmente a la Iteración N+1, eliminando la corrupción de datos y manteniendo la matriz global en un estado nominal al iniciar cada evaluación. Adicionalmente, restaurar el archivo binario base satisface inherentemente el bloqueo de los elementos sanos ($D = 1.0$), ya que prohíbe algorítmicamente la ejecución de comandos de modificación (EMODIF) sobre elementos no seleccionados, previniendo así cuellos de botella y sobrecarga computacional en el motor del solver.

3.10.2 Identificación y asignación dinámicas de propiedades de elementos

Para mapear las matrices de penalización estocástica en el modelo de elementos finitos sin destruir la topología base, el script de PyMAPDL utiliza como identificadores una propiedad de los elementos que componen el modelo llamada Gestores de Componentes (Component Managers - CM). El controlador en Python define arreglos que contienen las cadenas CM válidas para cada zona de riesgo (ej., `G_C0_L0`). Durante cada iteración, se extrae aleatoriamente y sin reemplazo un número discreto de componentes (m).

La codificación de los elementos, desde los modelos de calibración, usan la topología base única, por lo que los elementos del pórtico de guadua son iguales para los modelos GS, GHS y GSHS. Por lo tanto, los números de identificación (ID Elem. en tabla 9) de los 3 modelos son exactamente los mismos; siendo la única diferencia, la adición de las latas para las tipologías GHS y GSHS. Dado que ANSYS no permite exportar etiquetas de Gestores de Componentes (CM) como texto en el post-procesador gráfico, la trazabilidad entre identificadores numéricos y denominaciones CM se documenta exclusivamente en la siguiente tabla e imágenes.

Tabla 6 Mapeo de elementos por zona de biodeterioro en los modelos numéricos

Zona	CM (ANSYS)	ID Elem.	Zona	CM (ANSYS)	ID Elem.
A	G_C0_L0	1	C	D_R_BOT	72
A	G_C1_L0	23	D	L_F_1	77*
A	G_C2_L0	45	D	L_F_1	78*
A	G_C0_L21	22	D	L_F_2	81*
A	G_C1_L21	44	D	L_F_2	82*
A	G_C2_L21	66	D	L_F_3	85*
B	G_C0_L0	1	D	L_F_3	86*
B	G_C0_L1	2	D	L_F_4	89*
B	G_C0_L2	3	D	L_F_4	90*
B	G_C0_L3	4	D	L_F_5	93*
B	G_C0_L4	5	D	L_F_5	94*
B	G_C1_L0	23	D	L_B_1	79*
B	G_C1_L1	24	D	L_B_1	80*
B	G_C1_L2	25	D	L_B_2	83*
B	G_C1_L3	26	D	L_B_2	84*
B	G_C1_L4	27	D	L_B_3	87*
B	G_C2_L0	45	D	L_B_3	88*
B	G_C2_L1	46	D	L_B_4	91*
B	G_C2_L2	47	D	L_B_4	92*
B	G_C2_L3	48	D	L_B_5	95*
B	G_C2_L4	49	D	L_B_5	96*
C	D_L_BOT	69			

Nota. Las Zonas A, B y C y sus identificadores de elemento son comunes a los tres modelos estructurales (GS, GHS y GSHS). *Los identificadores de la Zona D aplican exclusivamente a los modelos GHS y GSHS, correspondiendo al biodeterioro formulado para el escenario D. Elaboración propia.

Figura 16 *Identificación de elementos para modelo GS en ANSYS*

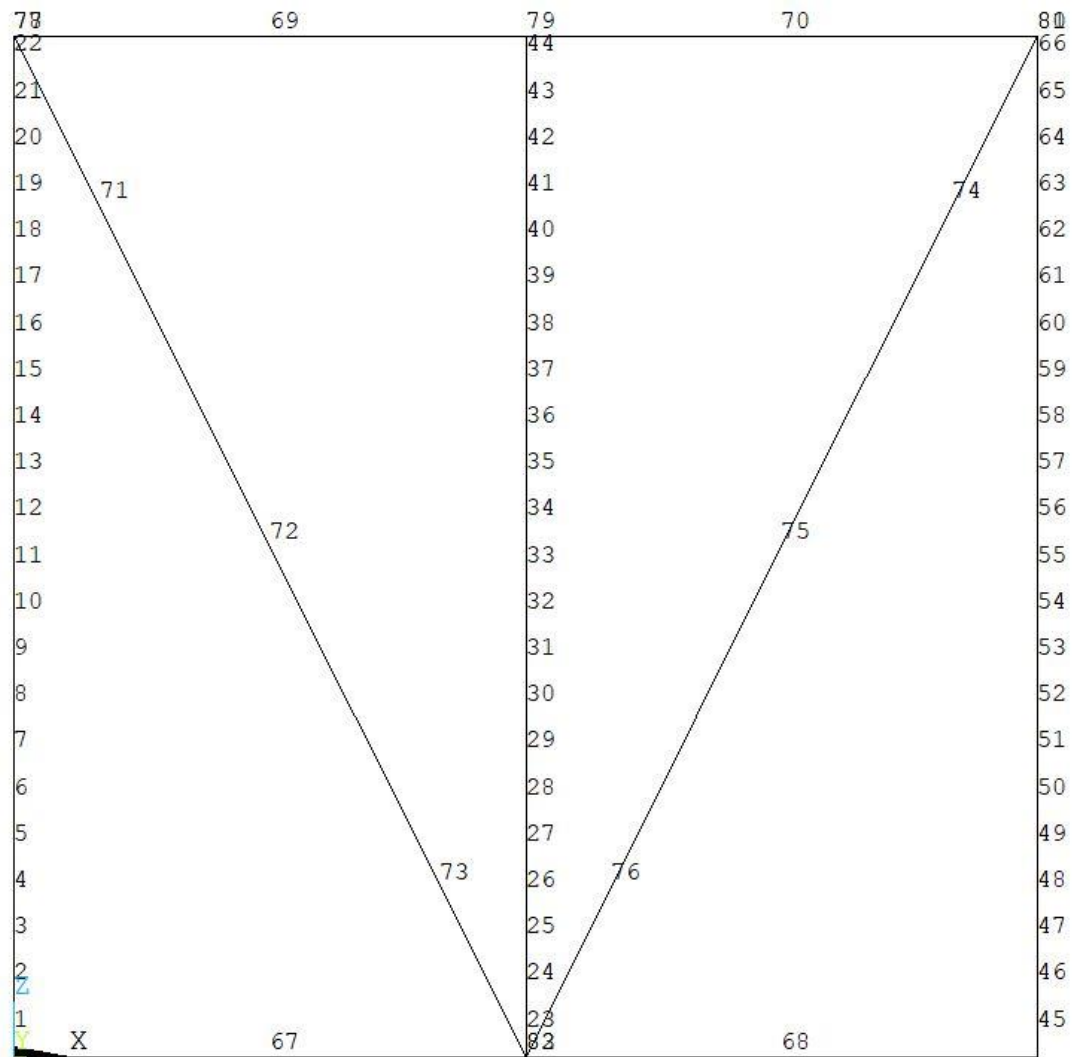
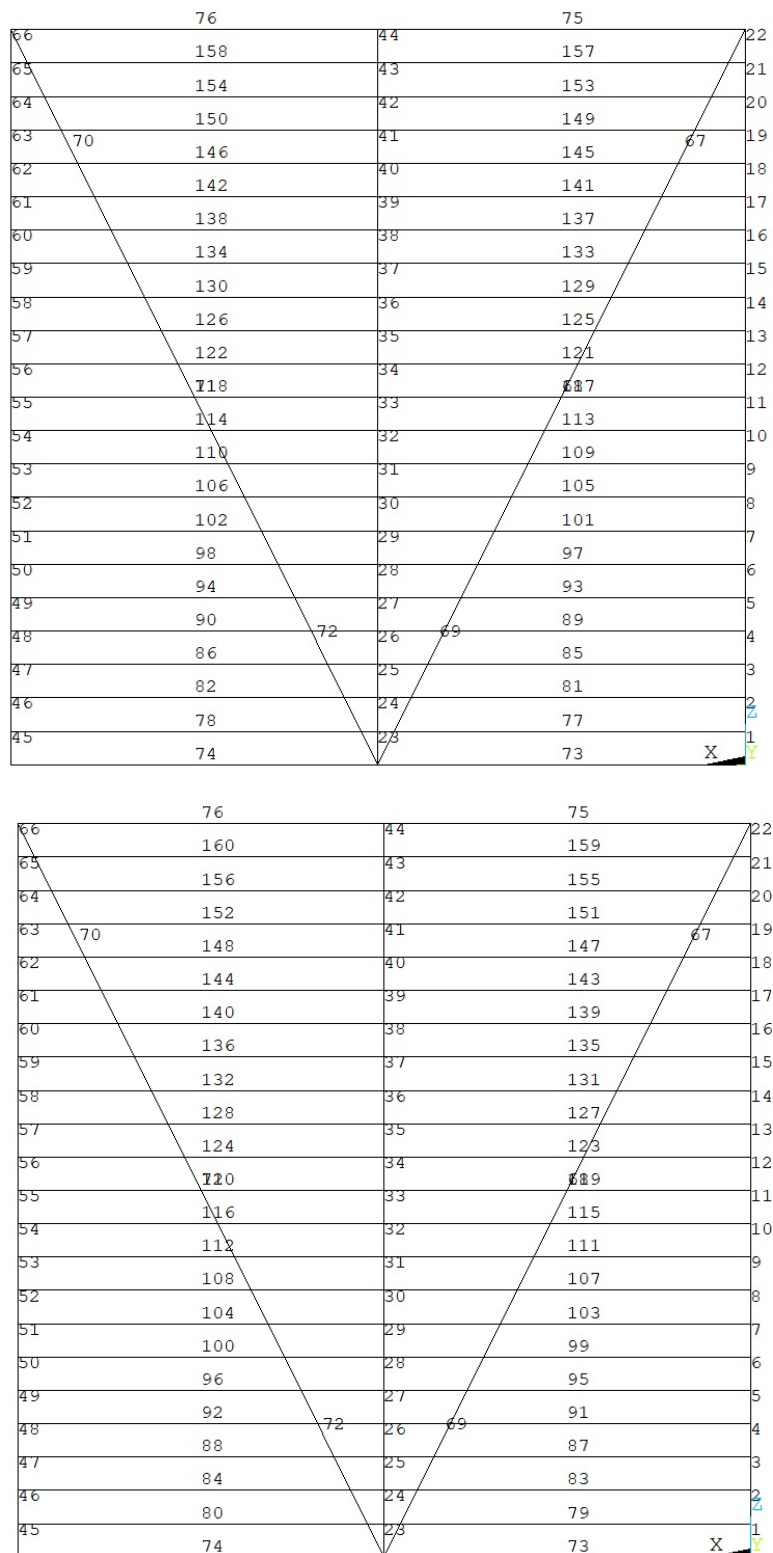
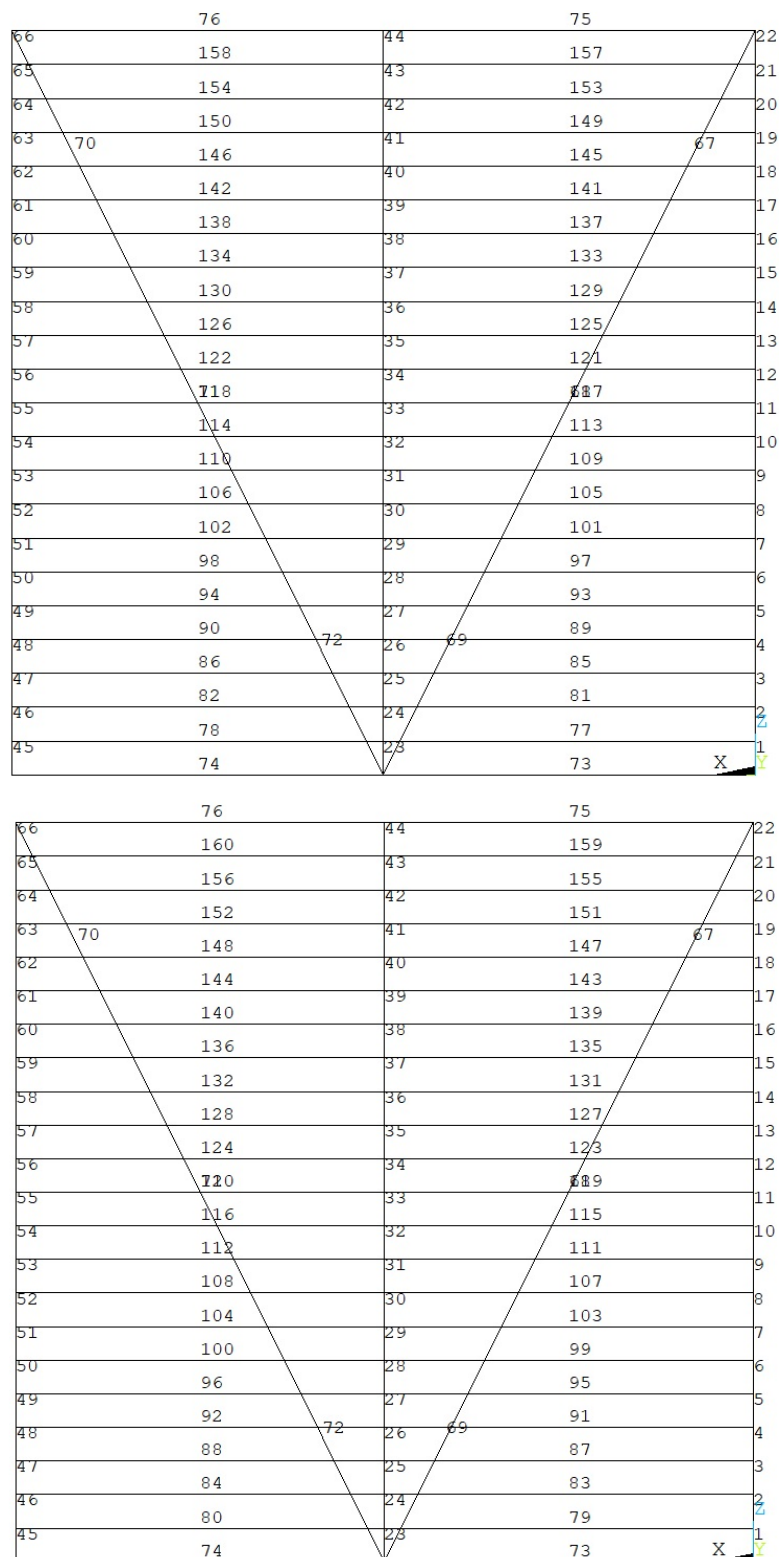


Figura 17 Identificación de elementos para modelo GHS en ANSYS



Nota. La imagen superior muestra las latas frontales, la imagen inferior las latas traseras

Figura 18 Identificación de elementos para modelo GSHS en ANSYS



Nota. La imagen superior muestra las latas frontales, la imagen inferior las latas traseras

El script ejecuta el comando `mapdl.cmsel` para aislar el componente objetivo, genera un ID de material dinámico único, aplica el módulo EX_{rand} derivado del LHS, y ejecuta la rutina EMODIF. Posteriormente, la segregación topológica mediante constantes REAL aísla el daño por biodeterioro para cada escenario. El algoritmo genera identificadores únicos y distintos para separar la rigidez transversal del suelo (k_s), la adherencia axial (k_{bond}) y el módulo de deslizamiento de la unión (k_e). Esto previene la sobreescritura catastrófica de los parámetros de frontera al momento de su penalización

3.10.3 Manejo de colapso numérico

Dado que el proceso evalúa una degradación aleatoria bajo cargas estáticas puras y sin incursar al rango no lineal geométrico (NLGEOM, OFF), existe la probabilidad matemática de que el nivel de deterioro local en las uniones anule completamente la matriz de rigidez, causando un fallo de convergencia por pivoteo negativo en el motor APDL. En caso de colapso de la matriz, el *script* de Python incorpora un bloque de excepciones (`try/except`) que rescata el proceso de un cierre abrupto. La iteración colapsada es registrada automáticamente con un desplazamiento de deflexión lateral de $\Delta_{TOP} = 9999.0$ mm, funcionando como bandera o *flag* de colapso estructural.

3.10.4 Ejecución y trazabilidad

Para evitar embotellamientos de red o colapsos de entrada/salida durante el bucle de $N = 100$ ejecuciones iterativas, se suprimió la escritura de archivos binarios .db individuales. El controlador de Python computó la información extraída y la consolidó de forma automatizada en dos archivos CSV fundamentales en modo de adición (`append`):

- *stochastic_traceability_log.csv*: Conserva el rastro microscópico y atómico del análisis estocástico. Registra el número de la iteración, el identificador del componente de ANSYS penalizado (`Component_ID`) perteneciente a cada zona de daño, y los valores exactos generados para EX_{rand} , $k_{e,rand}$ y el Factor de Daño D .
- *stochastic_drift_results.csv*: Documenta los resultados macroscópicos que construyen las curvas de fragilidad. Contiene el escenario modelado, la deflexión final obtenida (`Delta_TOP_mm`) y el marcador booleano en caso de colapso numérico.

Tabla 7 Extracto representativo del rastro de penalización estocástica LHS - Escenario A (GS)

Iteración	Zona	Componente (ANSYS)	E_X (MPa)	k_e (N/mm)	Factor D
1	A	G_C1_L0	8592.49	239.31	0.9239
1	A	G_C2_L0	9058.10	252.28	0.9740
1	A	G_C0_L21	6047.22	168.42	0.6502
1	A	G_C0_L0	8759.33	243.96	0.9419
4	A	G_C1_L0	388.15	10.81	0.0417
4	A	G_C0_L0	4877.15	135.84	0.5244
30	A	G_C2_L0	4585.63	127.72	0.4931
30	A	G_C0_L21	7734.40	215.42	0.8317
30	A	G_C2_L21	1416.93	39.46	0.1524
50	A	G_C1_L21	4495.56	125.21	0.4834
50	A	G_C2_L21	6577.39	183.19	0.7072
100	A	G_C1_L0	5674.60	158.05	0.6102
100	A	G_C1_L21	7759.61	216.12	0.8344
100	A	G_C2_L21	2696.61	75.10	0.2900

Nota. Extraído de *stochastic_traceability_log_GS_A.csv*.

De la anterior tabla se omitieron las columnas operativas Dynamic_MAT_ID y Dynamic_REAL_ID para no saturar el documento final. El rastro completo de 100 iteraciones y 300 asignaciones se adjunta en los anexos de esta tesis.

Para prevenir la corrupción y mezcla de los datos entre los cinco escenarios y las tres topologías estructurales estudiadas, toda la arquitectura en el ordenador forzó una estricta segregación en 15 directorios de salida únicos (ej. /Stochastic_LHS/GSHS/Scenario_C/), lo que garantizó la integridad del análisis de la vulnerabilidad probabilística final.

3.10.5 Condiciones de carga y evaluación de falla

Durante la ejecución del bucle LHS, los modelos topológicos se someten estrictamente a las cargas estáticas objetivo, redondeadas a dos decimales, de las calibraciones realizadas a los modelos en el capítulo 3: $V_{load} = 0.33$ kN para GS, $V_{load} = 2.67$ kN para GHS, y $V_{load} = 3.00$ kN para GSHS. Es importante aclarar que la evaluación de falla estructural no se realiza

internamente en el *solver* de ANSYS (a menos que ocurra un colapso numérico, tal como se explica en el numeral 4.4.3.). En su lugar, los desplazamientos resultantes (Δ_{TOP}) son extraídos para ser evaluados *a posteriori* contra los umbrales de los Estados Límite de Servicio (SLS) en la fase de post-procesamiento.

4 RESULTADOS Y ANÁLISIS

En este capítulo se muestran los resultados de las calibraciones de los modelos base y los del análisis paramétrico del daño por deterioro, realizando su respectivo análisis para cada caso.

4.1 CALIBRACIÓN INICIAL DE LOS MODELOS BASE

En esta sección del documento, se registran los resultados de la calibración de los tres modelos en ANSYS, para ser utilizados como base para la ejecución del análisis paramétrico.

4.1.1 Modelo GS (Guadua skeleton)

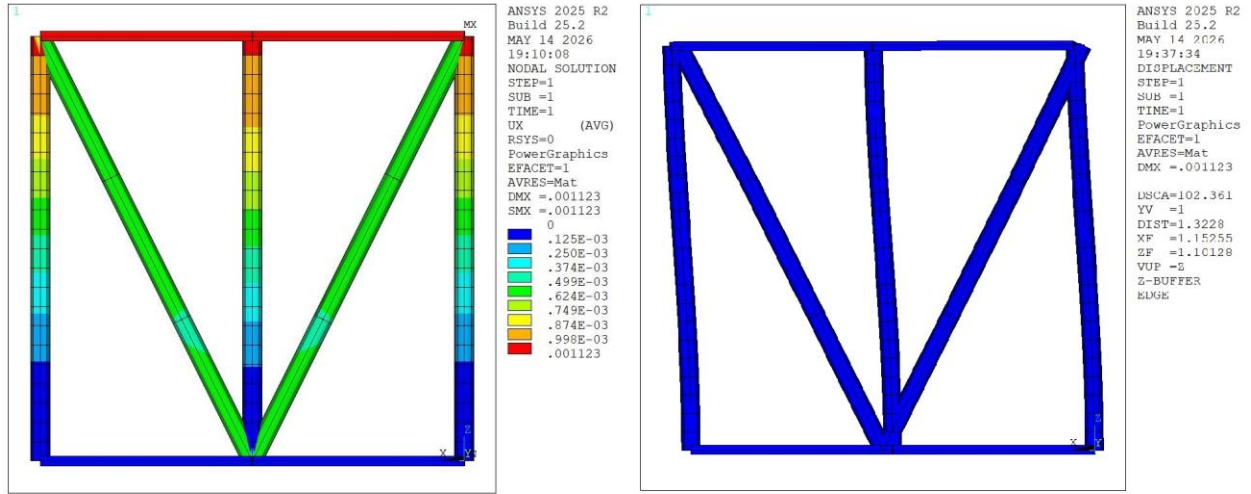
La calibración del pórtico simple arrojó un módulo de deslizamiento de las conexiones de guadua de $k_e = 260.89$ N/mm. Esta calibración fue ejecutada en el rango estrictamente elástico inicial limitando los desplazamientos experimentales a 1.0 mm, logrando un error casi nulo ($RMSE = 0.0002$ mm).

Tabla 8 Validación de resultados modelo GS (Guadua skeleton)

Paso de Carga	Fuerza V (kN)	Δ Experimental (mm)	Δ FEM (mm)	Error (mm)	Δ Base (mm)
1	0.06770	0.2000	0.2001	0.0001	0.0000
2	0.13540	0.4000	0.4001	0.0001	0.0000
3	0.20311	0.6000	0.6002	0.0002	0.0000
4	0.27081	0.8000	0.8002	0.0002	0.0000
5	0.33851	1.0000	1.0003	0.0003	0.0000

Nota. Calibración ejecutada en 12 iteraciones con un E_x fijo de 9.3 GPa para la Guadua. El módulo de deslizamiento calibrado es $k_e = 260.89$ N/mm, alcanzando un error cuadrático medio de $RMSE = 0.0002$ mm a lo largo de 5 puntos de control.

Figura 19 Deformación del modelo GS



Nota. Escala de colores en metros.

4.1.2 Modelo GHS (Guadua skeleton horizontal strips)

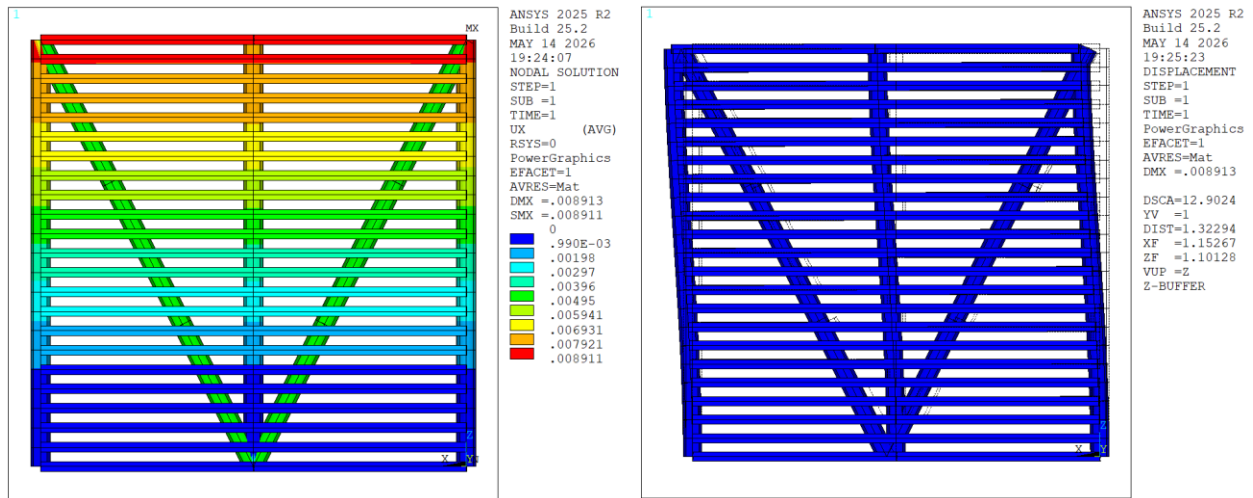
Al incorporar la red de tiras de guadua (o latas) por ambas caras el muro, la optimización acotó el valor de rigidez global de las conexiones de portico de guadua y las latas en $k_e = 259.02$ N/mm. El proceso convergente minimizó el error hasta $RMSE = 0.0009$ mm, logrando capturar la deflexión lateral Δ_{TOP} de la envolvente equivalente a $V = 2.67$ kN con un desplazamiento tope de 7.93 mm en el quinto escalón de carga.

Tabla 9 Validación de resultados modelo GHS (Guadua skeleton horizontal strips)

Paso de Carga	Fuerza V (kN)	Δ Experimental (mm)	Δ FEM (mm)	Error (mm)	Δ Base (mm)
1	0.53496	1.5867	1.5865	-0.0003	0.0000
2	1.06992	3.1735	3.1730	-0.0005	0.0000
3	1.60488	4.7602	4.7594	-0.0008	0.0000
4	2.13984	6.3469	6.3459	-0.0010	0.0000
5	2.67480	7.9337	7.9324	-0.0013	0.0000

Nota. Calibración ejecutada en 14 iteraciones con un E_x fijo de 9.3 GPa para la Guadua. El módulo de deslizamiento calibrado es $k_e = 259.02$ N/mm, alcanzando un error cuadrático medio de $RMSE = 0.0009$ mm a lo largo de 5 puntos de control.

Figura 20 Deformación del modelo GHS



Nota. Escala de colores en metros.

4.1.3 Modelo GSHS (Guadua skeleton with strips and soil mixture)

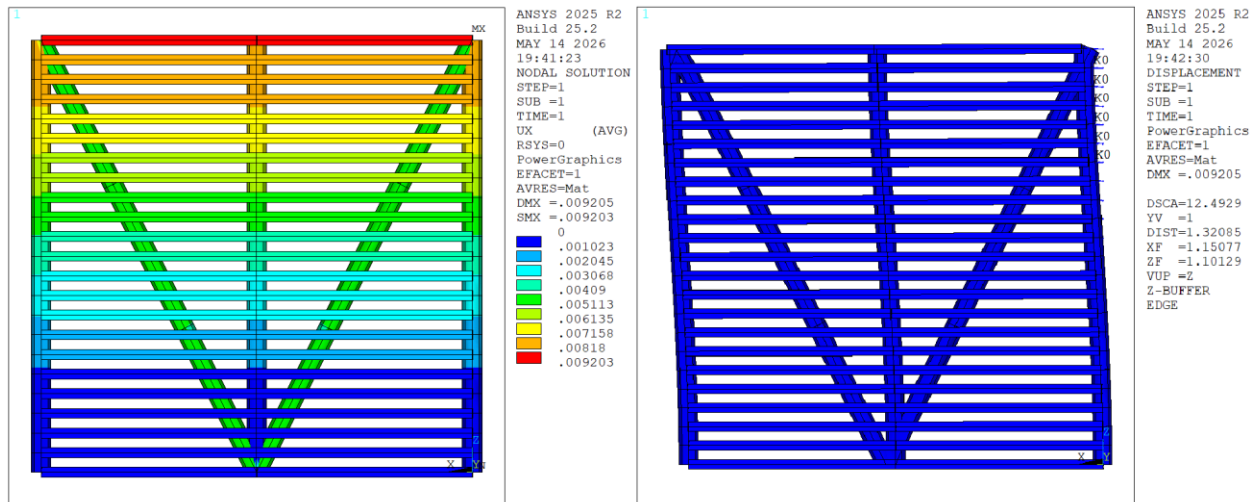
Con el sistema de bahareque completo y la fijación absoluta del k_e validado en la etapa anterior (259.02 N/mm), la calibración del parámetro de interacción inercial de la tierra (E_{soil}) convergió asintóticamente a $E_{soil} = 0.30$ MPa. Esto se traduce de forma simultánea en un módulo de Winkler transversal de $k_s = E_{soil}/2.1m = 0.14$ MN/m³ y una rigidez axial constante de adherencia que desprecia el efecto de confinamiento sobre la guadua $k_{bond} = 1.00$ N/m/m. Esta combinación logró un error numérico cero ($RMSE = 0.0000$ mm) para un cortante final de 3.00 kN a un desplazamiento de 7.87 mm.

Tabla 10 Validación de resultados modelo GSHS (*Guadua skeleton with strips and soil mixture*)

Paso de Carga	Fuerza V (kN)	Δ Experimental l (mm)	Δ FEM (mm)	Error (mm)	Δ Base (mm)
1	0.60	1.5753	1.5753	0.0000	0.0000
2	1.20	3.1506	3.1506	0.0000	0.0000
3	1.80	4.7258	4.7258	0.0000	0.0000
4	2.40	6.3011	6.3011	0.0000	0.0000
5	3.00	7.8764	7.8764	0.0000	0.0000

Nota. Calibración ejecutada en 27 iteraciones manteniendo k_e fijo en 259.02 N/mm y k_{bond} fijo en 1.00 N/m/m. El parámetro de interacción inercial del suelo convergido es $E_{soil} = 0.30$ MPa ($k_s = 0.14$ MN/m³), alcanzando un error cuadrático medio nulo (RMSE = 0.0000 mm) a lo largo de 5 puntos de control.

Figura 21 Deformación del modelo GSHS



Nota. Escala de colores en metros.

El valor calibrado de k_e representa una rigidez secante efectiva global. Al ser un modelo fenomenológico de optimización inversa, este único parámetro agrupa matemáticamente todas las deficiencias físicas de la unión real que el modelo lineal no captura de forma explícita, tales como el aplastamiento local y la fisuración de la guadua

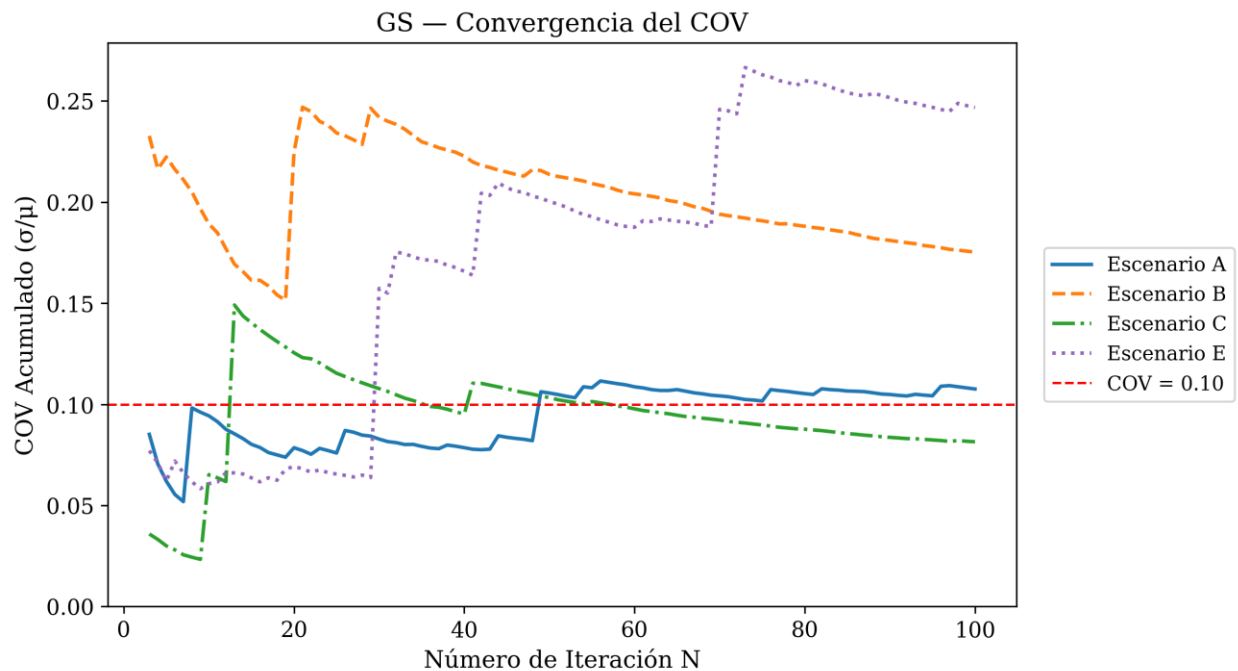
4.2 Análisis Paramétrico y Evaluación De Fragilidad (SLS)

En esta sección del documento, se mostrarán los resultados del análisis paramétrico del biodeterioro en las zonas de daño declaradas y su validación estadística.

4.2.1 Validación estadística: Convergencia estadística por escenario de daño

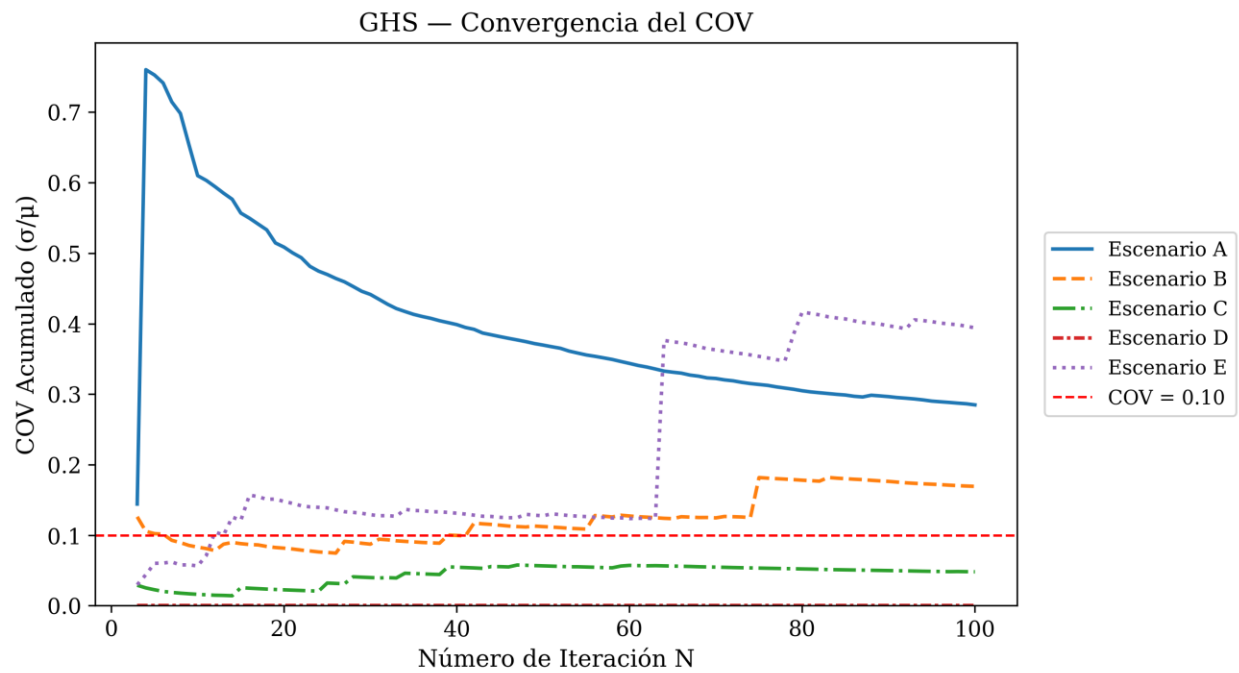
Con el propósito de validar estadísticamente el análisis paramétrico, se ejecutaron 100 iteraciones del Muestreo de Hipercubo Latino (LHS) por cada una de las 14 combinaciones de topología (3 modelos: GS, GHS, GSHS) y escenario (5 escenarios: A, B, C, D, E), excepto en la combinación GS-Escenario D, sumando la totalidad de 1400 iteraciones. El seguimiento del Coeficiente de Variación (COV) del desplazamiento lateral en el nodo de control ($Z=2.10$ m) demostró una estabilización asintótica en todas las configuraciones evaluadas. Lo anterior confirma la viabilidad de del límite de $N=100$ iteraciones para capturar el espectro de daño de todos los escenarios sin incurrir en costos computacionales excesivos.

Figura 22 Convergencia del COV para el modelo GS



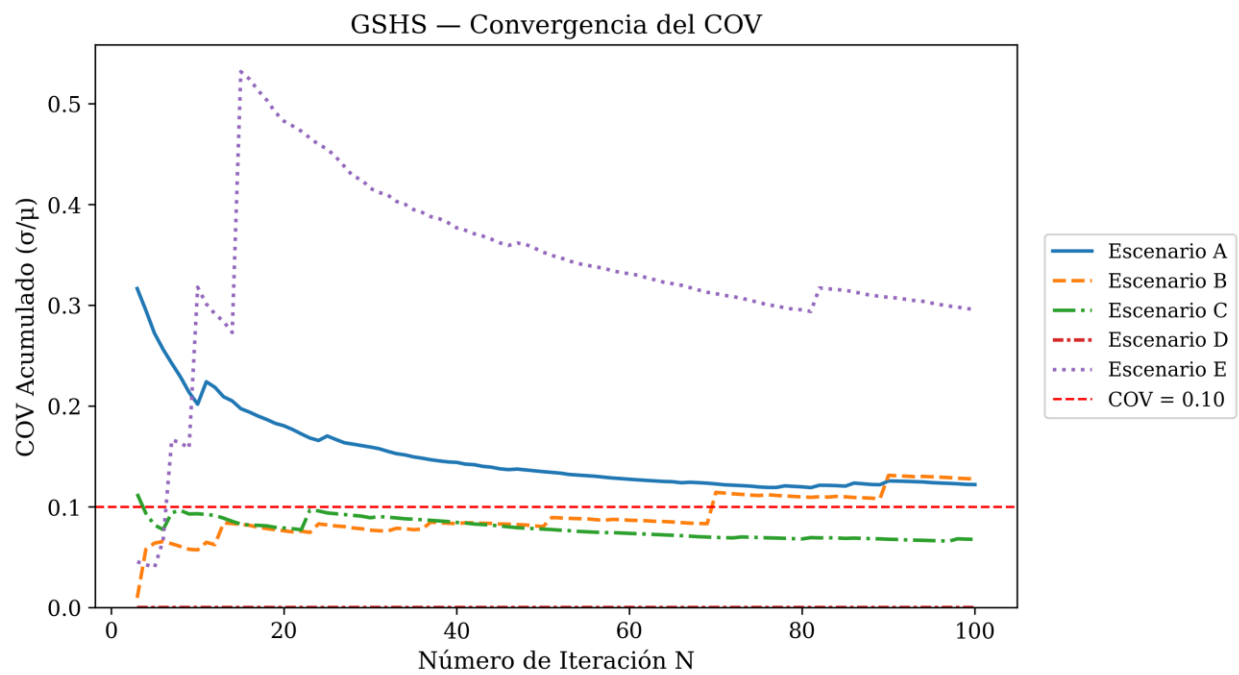
Nota. Fuente: Elaboración propia.

Figura 23 Convergencia del COV para el modelo GHS



Nota. Fuente: Elaboración propia.

Figura 24 Convergencia del COV para el modelo GSHS



Nota. Fuente: Elaboración propia.

4.2.2 Validación del tamaño muestral y convergencia

Las gráficas de los coeficientes de variación COV (Figuras 20, 21 y 22) ratifican la efectividad del muestreo estratificado LHS, el cual segmenta los parámetros de escenario de biodeterioro en intervalos de igual probabilidad. Alcanzar la convergencia estadística en $N = 100$ iteraciones garantiza una población de datos lo suficientemente robusta para cuantificar la fragilidad de los 3 modelos estructurales. Para este análisis se adoptó una función de distribución lognormal, una hipótesis matemáticamente coherente con el comportamiento físico de los muros. En escenarios de deterioro, la pérdida progresiva de rigidez genera una distribución con sesgo positivo, donde unos pocos casos extremos muestran desplazamientos laterales pronunciadas que exceden los umbrales de servicio, sin que esto implique su colapso estructural.

La validación matemática de la convergencia se determinó calculando el diferencial porcentual absoluto entre la iteración 90 y la iteración 100, definido por la ecuación:

$$\Delta COV_{\%} = \left| \frac{COV_{100} - COV_{90}}{COV_{90}} \right| \times 100$$

La validación matemática del COV mostró deltas porcentuales ($\Delta COV_{\%}$) oscilantes entre el 2% y el 4% para todos los escenarios propuestos. Alcanzar esta estabilización asintótica en $N = 100$ iteraciones demuestra la eficiencia de reducción de varianza de la estratificación LHS; forzar iteraciones adicionales incrementaría el costo computacional sin alterar significativamente la función de distribución lognormal.

Asimismo, exigir un criterio de parada generalizado hiper-restrictivo (ej. $\Delta COV_{\%} < 1\%$) representaría un sobreajuste probabilístico que no refleja la incertidumbre natural de la guadua y el bahareque. Cabe destacar que, para el Escenario D en las topologías GHS y GSHS, la inmunidad cinemática del escenario produce una varianza teórica nula ($\sigma^2 = 0$); por lo tanto, el cambio porcentual se asignó matemáticamente como 0.00% para resolver la indeterminación generada.

Tabla 11 Comparativa de estabilización de COV (N=90 vs N=100)

Topología	Escenario	COV₉₀	COV₁₀₀	$\Delta COV_{\%}$
GS	Escenario A	0.1049	0.1076	2.59%
GS	Escenario B	0.1811	0.1753	3.19%
GS	Escenario C	0.0837	0.0815	2.63%
GS	Escenario E	0.2516	0.2468	1.93%
GHS	Escenario A	0.2965	0.2848	3.95%
GHS	Escenario B	0.1763	0.1692	4.01%
GHS	Escenario C	0.0498	0.0481	3.48%
GHS	Escenario D	0.0000	0.0000	0.00%
GHS	Escenario E	0.3969	0.3940	0.73%
GSHS	Escenario A	0.1257	0.1221	2.86%
GSHS	Escenario B	0.1313	0.1277	2.74%
GSHS	Escenario C	0.0679	0.0678	0.16%
GSHS	Escenario D	0.0000	0.0000	0.00%
GSHS	Escenario E	0.3078	0.2959	3.87%

Nota. Elaboración propia. Los datos reflejan el Coeficiente de Variación acumulado en la iteración 90 frente a la iteración final (100).

4.3 Umbrales de daño por Estados Límite de Servicio (SLS)

En este apartado de la investigación, se documenta los estados límite de servicio establecidos para poder analizar el comportamiento del biodeterioro de la guadua, como parte del análisis paramétrico realizado en los modelos de los muros de bahareque.

4.3.1 Derivación de los Estados Límite de Daño (DS1, DS2 y DS3)

El criterio de biodeterioro de este análisis paramétrico considera Estados Límite de Servicio (SLS), enfocados en la pérdida progresiva de rigidez durante niveles operativos de deflexiones laterales. Los límites de servicio se determinaron usando como límite inferior, los desplazamientos laterales obtenidos en la metodología de disipación de energía equivalente (EEEP) explicados en el numeral 3.3.2 de este documento. A partir de estos límites elásticos equivalentes, se proyectaron los estados de daño progresivo (DS1, DS2 y DS3) aplicando incrementos porcentuales. Para los modelos con GHS y GSHS, los umbrales representan incrementos del 25 %, 50 % y 75 % respecto

al desplazamiento base. Para el modelo GS, la progresión del daño se escaló en un 25 %, 50 % y 100 %. Los desplazamientos límite resultantes evaluados a $Z = 2.10$ m se consolidan en la Tabla 12.

Tabla 12 *Umbral de desplazamiento lateral para Estados Límite de Servicio*

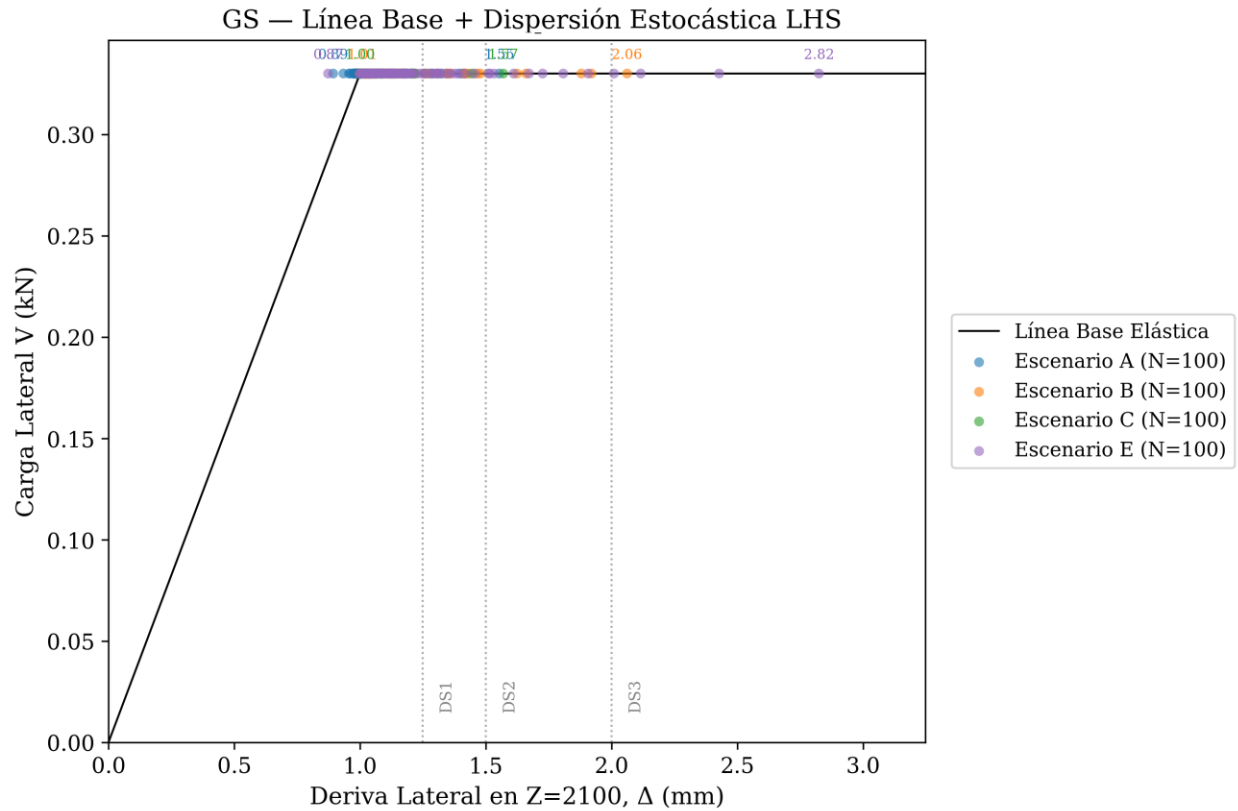
Topología	Descripción	Desplazamiento EEEP Base (mm)	DS1 (+25%) (mm)	DS2 (+50%) (mm)	DS3 (Extremo) (mm)
GS	Pórtico de guadua	1.0000	1.2500	1.5000	2.0000
GHS	Pórtico y latas de guadua	7.9300	9.9125	11.8950	13.8750
GSHS	Pórtico, latas y relleno en tierra	7.8700	9.8375	11.8050	13.7725

Nota. Elaboración propia. El umbral DS3 representa un incremento del 100 % para el muro GS y del 75 % para los muros GHS y GSHS respecto a su respectivo desplazamiento EEEP base.

4.3.2 Comparación de excedencias

La evaluación estocástica no emplea los umbrales de daño de biodeterioro como determinísticos en una sola corrida; en su lugar, la nube de puntos (*scatter*) producto del LHS se superpone a la carga aplicada a la calibración de cada uno de los 3 tipos de muros de bahareque, evaluando qué porción de la población degradada sobrepasa los hitos funcionales SLS de su respectivo modelo. Las gráficas de dispersión estocástica tienen los valores máximos y mínimos de cada uno de los 5 escenarios. A continuación, se presentan los resultados:

Figura 25 *Dispersión estocástica vs. carga aplicada para el modelo GS*

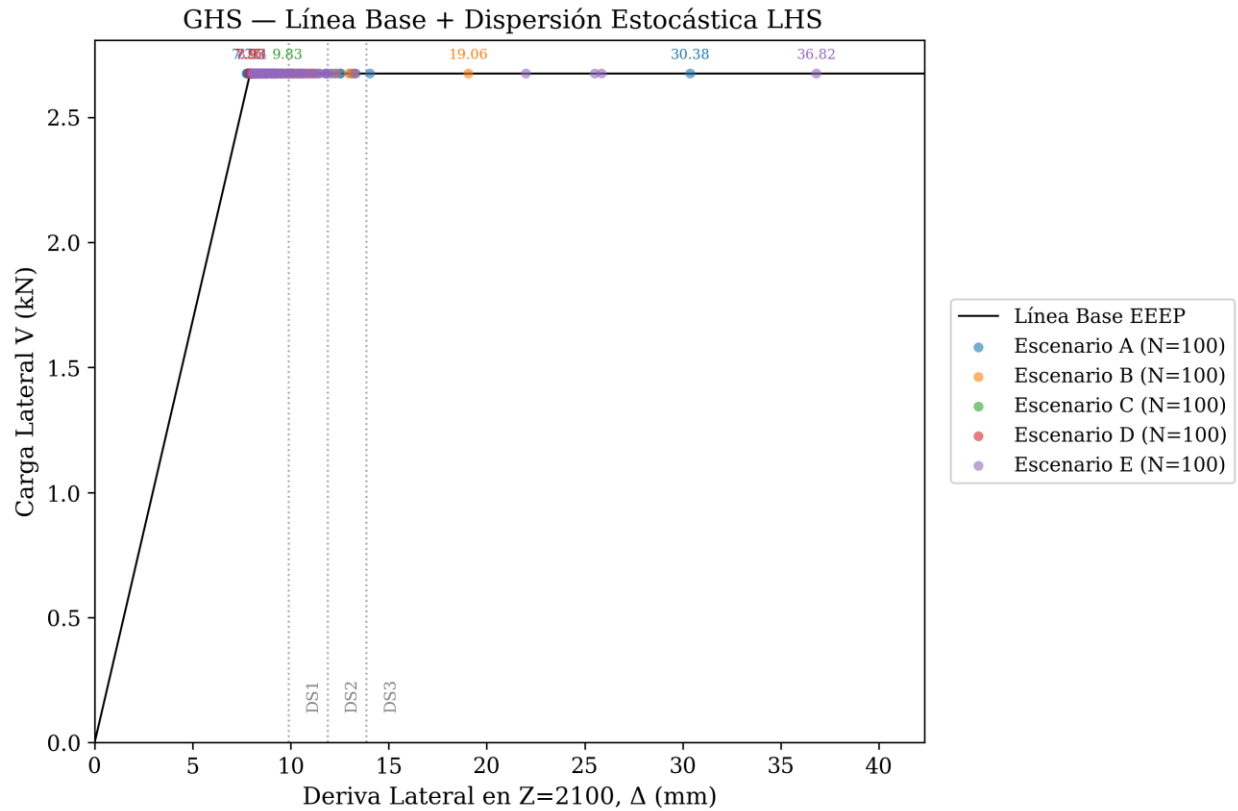


Nota. Fuente: Elaboración propia.

La observación de la nube de puntos que representan los desplazamientos laterales obtenidos para cada escenario para el modelo GS en la gráfica 23, muestra que para una carga de 0.33 kN, las deflexiones laterales se agrupan entre el desplazamiento base de 1.00 mm y el límite DS2. Entre los límites DS2 y DS3 se observan desplazamientos generados por los escenarios B, E y el desplazamiento máximo para el escenario A y C. Después del límite DS3, se encuentran los valores máximos para los escenarios B y E.

En el desplazamiento $\Delta = 1\text{ mm}$, se encuentran los valores mínimos de los escenarios B y C, con valores redondeados a 1.0 mm. Se observa también que hay datos del escenario A y E que sobrepasan el desplazamiento mínimo de calibración de 1mm, donde los valores mínimos para estos 2 escenarios son menores a 1mm. El motor de gráficos de ANSYS generó un error de escala, por lo que parece que los puntos se encuentran en un desplazamiento mucho menor que el indicado numéricamente dentro de la imagen.

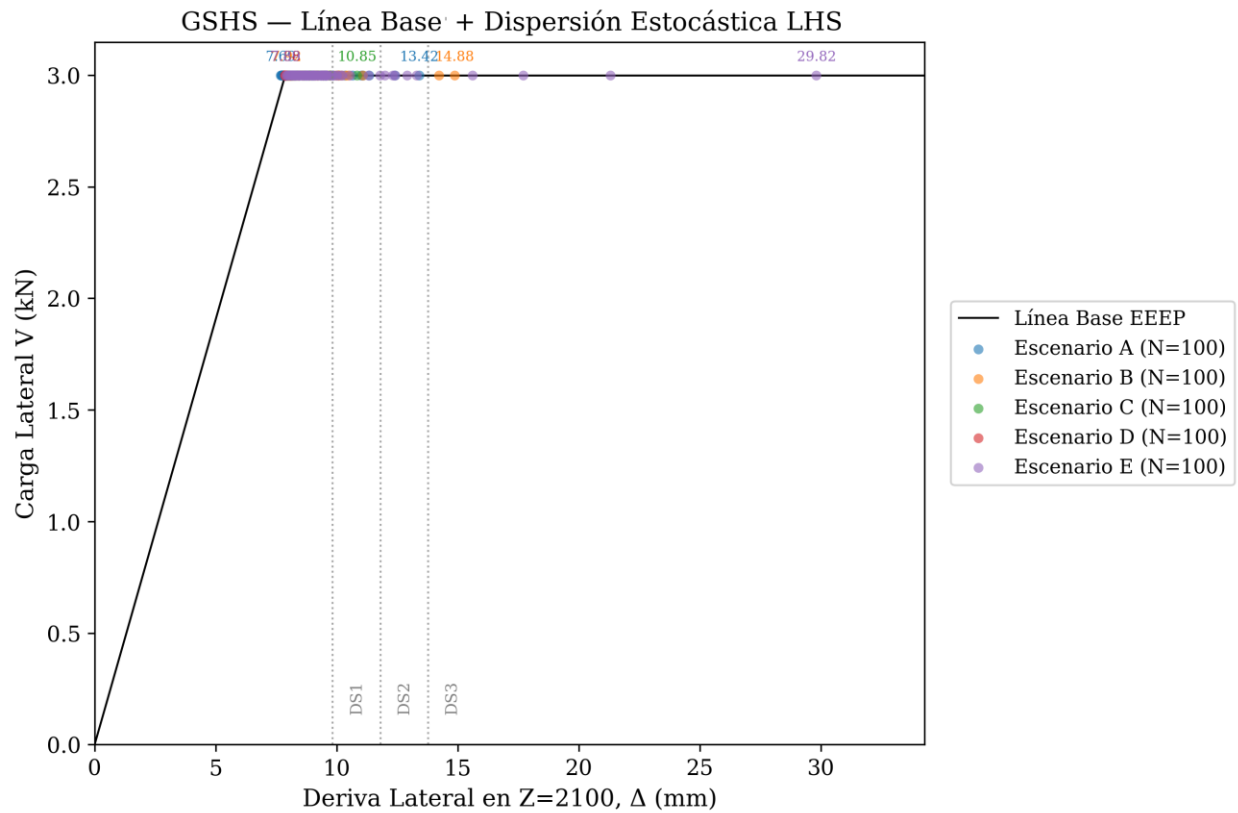
Figura 26 *Dispersión estocástica vs. carga aplicada para el modelo GHS*



Nota. Fuente: Elaboración propia.

La nube de puntos que representan los desplazamientos laterales obtenidos para los 5 escenarios para el modelo GHS en la gráfica 24, muestra que para una carga de 2.67 kN, los desplazamientos laterales se concentran entre el desplazamiento base de 7.93 mm y el límite DS2. Entre los límites DS2 y DS3 se observan una agrupación un poco más dispersa de algunos datos de todos los escenarios. Después del límite DS3, se encuentran los valores máximos para los escenarios B, A y E, siendo el último el de mayor magnitud. También se observa que para el escenario D, el valor máximo y mínimo de sus desplazamientos laterales está en el punto de calibración de 7.93mm; los valores mínimos de los otros 4 escenarios se encuentran alrededor de este valor.

Figura 27 *Dispersión estocástica vs. carga aplicada para el modelo GSHS*



Nota. Fuente: Elaboración propia.

La nube de puntos que representan los desplazamientos laterales obtenidos para los 5 escenarios para el modelo GSHS en la gráfica 25, muestra que para una carga de 3.00 kN, los desplazamientos laterales se concentran entre el desplazamiento base de 7.87 mm y antes de llegar al límite DS2. Entre los límites DS2 y DS3 se observan el valor máximo para el escenario A. Después del límite DS3, se encuentran los valores máximos para los escenarios B y E, siendo el último el de mayor magnitud. También se observa que para el escenario D, el valor máximo y mínimo de sus desplazamientos laterales está en el punto de calibración de 7.87mm; los valores mínimos de los otros 4 escenarios se encuentran alrededor de este valor.

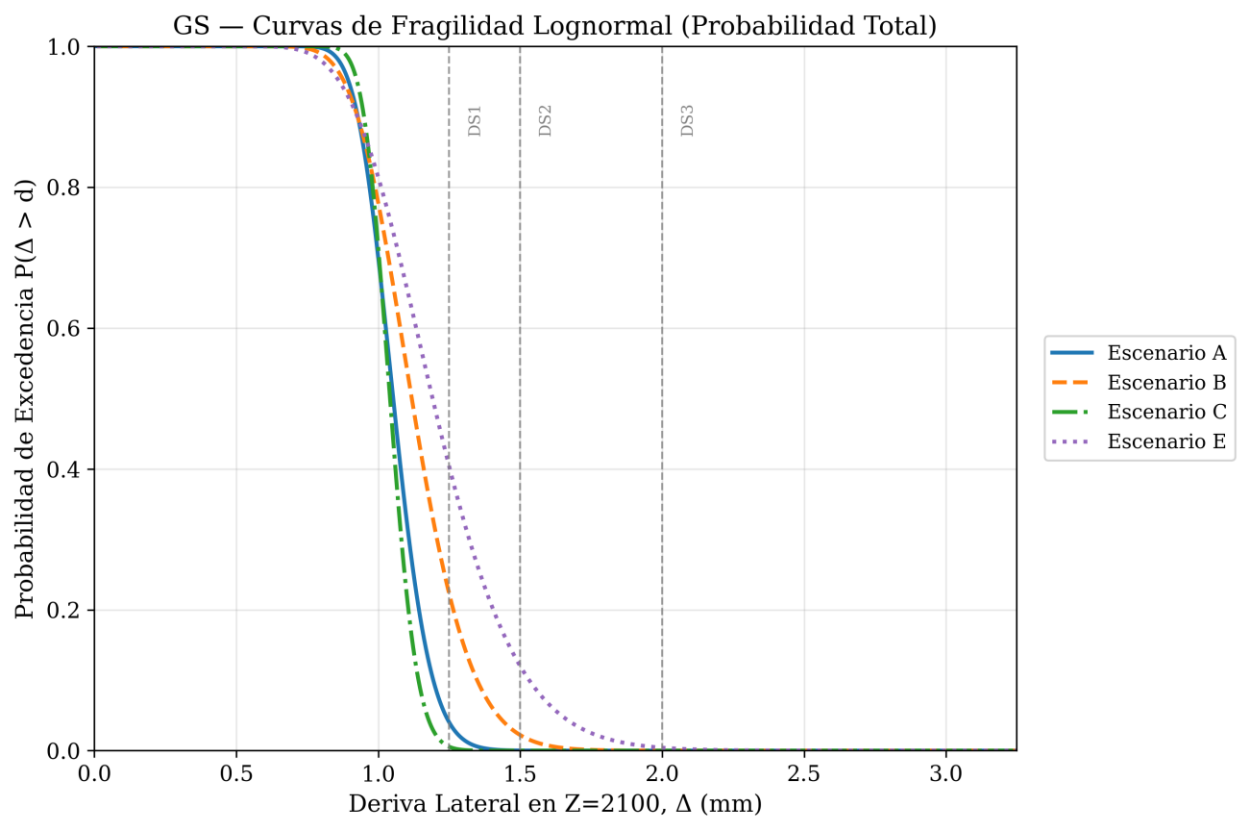
4.4 Curvas de fragilidad lognormal

En esta sección, se analizan las curvas de fragilidad, las cuales se realizaron para mostrar la probabilidad de excedencia de que el daño superara los estados límites de servicio establecidos en el numeral 4.3 de este documento.

4.4.1 Gráficos de probabilidad de excedencia por escenario

La función de densidad de probabilidad lognormal se utilizó para cuantificar analíticamente las probabilidades de daño por biodeterioro, considerando la imposibilidad física de desplazamientos negativos y la presencia de asimetría positiva en estructuras degradadas. Se aplicó una Función de Distribución Acumulativa (CDF) empleando las funciones analíticas del módulo estadístico de Python para calcular la probabilidad continua de exceder cualquier nivel de daño con respecto al desplazamiento esperado.

Figura 28 Curvas de fragilidad lognormal por escenario para el modelo GS

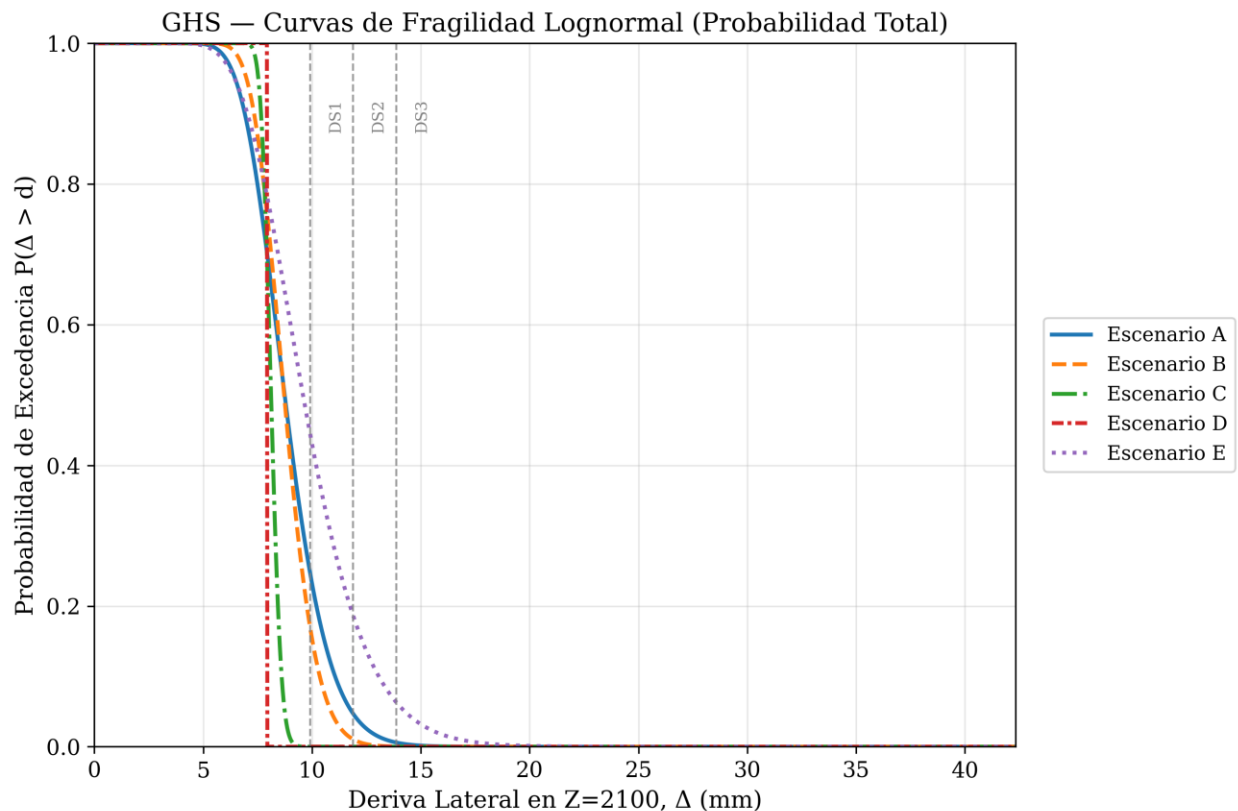


Nota. Fuente: Elaboración propia.

En general, para el modelo GS, todas las curvas son esbeltas y cuando la probabilidad de excedencia baja hasta el 60%, empiezan a dispersarse las pendientes de cada escenario. Para los escenarios A y C el biodeterioro es predecible y acotado; la probabilidad de excedencia para que el desplazamiento lateral supere el límite de servicio DS1 (25% de incremento) es casi 0% y para el DS2 (50% de incremento) es 0%.

Para los escenarios B y E se observa un poco más de incertidumbre y vulnerabilidad al biodeterioro. La probabilidad de excedencia para que el desplazamiento lateral del escenario B supere el límite de servicio DS1 es de 20% y para el DS2 es casi de 3%. Para el escenario E, la probabilidad de excedencia para que el desplazamiento lateral supere el límite de servicio DS1 es de 40%, para el DS2 es de alrededor de 12% y para el DS3 es de alrededor del 0.4%.

Figura 29 Curvas de fragilidad lognormal por escenario para el modelo GHS

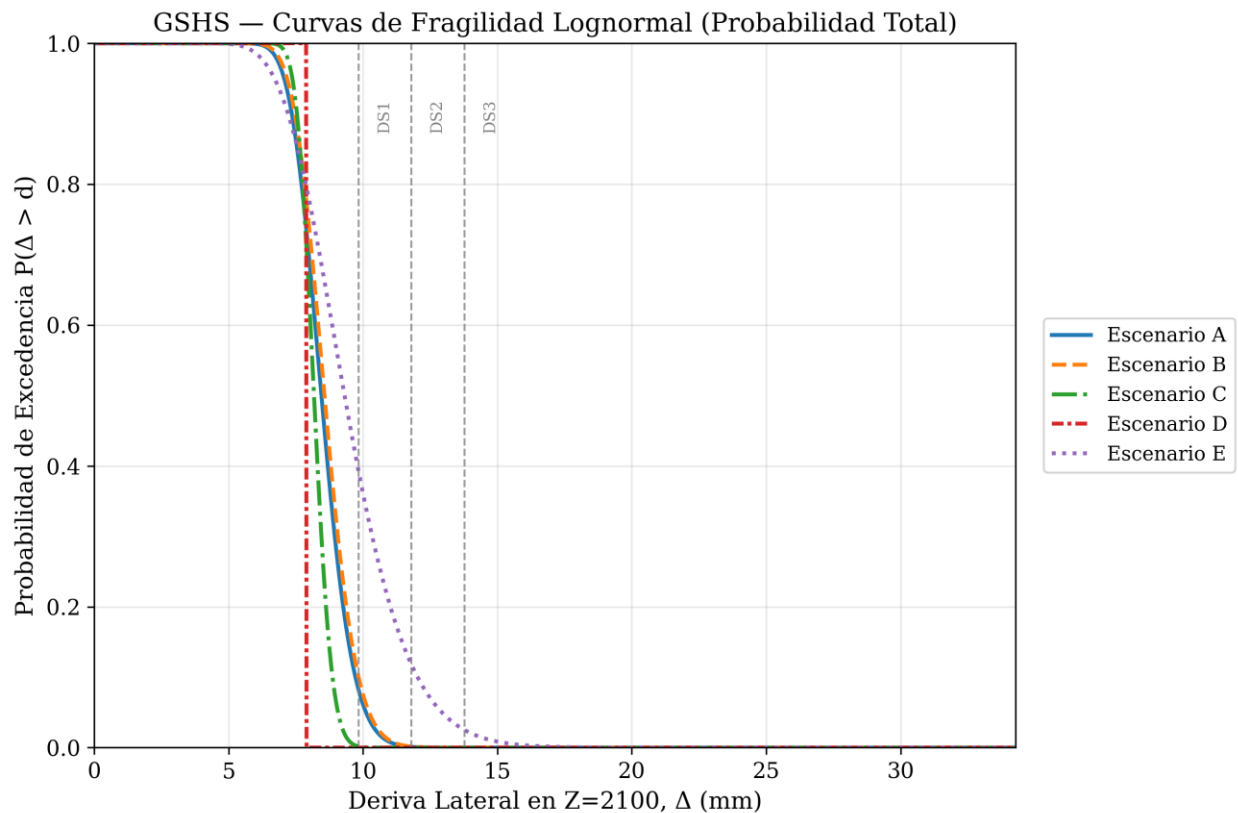


Nota. Fuente: Elaboración propia.

Para el modelo GHS, todas las curvas tienen pendientes empinadas y cuando la probabilidad de excedencia baja hasta el 75%, empiezan a cambiar las pendientes de cada escenario, excepto el escenario D, el cual es totalmente vertical en $\Delta = 7.93\text{mm}$. Para el escenario C, su comportamiento es casi vertical, siendo la probabilidad de que el desplazamiento lateral supere el límite de servicio DS1 del 0%. Para los escenarios A y B el biodeterioro es predecible y acotado; la probabilidad de excedencia para que el desplazamiento lateral supere el límite de servicio DS1 es alrededor del 20% para el escenario B y del 30% para el escenario C y para el DS2 para B es casi despreciable y para A es de alrededor de 5%.

Para el escenario E se observa una pendiente un poco más acostada, mostrando una mayor vulnerabilidad al biodeterioro. La probabilidad de excedencia para que el desplazamiento lateral supere el límite de servicio DS1 es de más del 40%, para el DS2 es de alrededor de 30% y para el DS3 es de alrededor del 5%.

Figura 30 Curvas de fragilidad lognormal por escenario para el modelo GSHS



Nota. Fuente: Elaboración propia.

Para el modelo GSHS, todas las curvas tienen pendientes empinadas y cuando la probabilidad de excedencia baja hasta el 80%, empiezan a cambiar las pendientes de cada escenario, excepto el escenario D, el cual es totalmente vertical en $\Delta = 7.87\text{mm}$. Para el escenario C, su comportamiento es casi vertical, siendo la probabilidad de que el desplazamiento lateral supere el límite de servicio DS1 casi del 0%. Para los escenarios A y B, sus pendientes son casi iguales; la probabilidad de excedencia para que el desplazamiento lateral supere el límite de servicio DS1 es menos del 10% para ambos escenarios y para el DS2 es casi nula.

Para el escenario E se observa una pendiente un poco más acostada, mostrando una mayor vulnerabilidad al biodeterioro. La probabilidad de excedencia para que el desplazamiento lateral supere el límite de servicio DS1 es de alrededor del 40%, para el DS2 es de más del 10% y para el límite de servicio DS3 es de menos del 3%.

4.4.2 Análisis comparativo por escenario y topología

Las probabilidades analíticas extraídas de las simulaciones demuestran marcadas susceptibilidades al biodeterioro en los escenarios donde las probabilidades de daño eran más elevadas, como también la combinación de todos los escenarios. La Tabla 13 presenta el resumen probabilístico abarcando todas las tipologías y escenarios modelados, consolidando los 14 casos válidos de las iteraciones.

Tabla 13 *Parámetros de fragilidad y probabilidades de excedencia globales (N=100)*

Topología	Escenario	μ_{ln}	σ_{ln}	Prob. Excedencia DS1	Prob. Excedencia DS2	Prob. Excedencia DS3
GS	A (Uniones)	0.0514	0.0981	4.01%	0.02%	0.00%
GS	B (Bases)	0.1117	0.1460	22.26%	2.21%	0.00%
GS	C (diagonales)	0.0407	0.0718	0.55%	0.00%	0.00%
GS	E (Global)	0.1752	0.1961	40.33%	12.01%	0.41%
GHS	A (Uniones)	2.1685	0.1834	24.73%	4.68%	0.59%
GHS	B (Bases)	2.1656	0.1344	17.01%	1.04%	0.03%
GHS	C (diagonales)	2.0943	0.0455	0.00%	0.00%	0.00%
GHS	D (latas)	2.0710	0.0000	0.00%	0.00%	0.00%
GHS	E (Global)	2.2604	0.2418	44.51%	18.62%	6.31%
GSHS	A (Uniones)	2.1342	0.1090	8.15%	0.11%	0.00%
GSHS	B (Bases)	2.1475	0.1078	9.91%	0.14%	0.00%
GSHS	C (diagonales)	2.1010	0.0631	0.17%	0.00%	0.00%
GSHS	D (latas)	2.0647	0.0000	0.00%	0.00%	0.00%
GSHS	E (Global)	2.2313	0.1998	39.17%	11.76%	2.51%

Nota. Elaboración propia. Los datos reflejan las probabilidades calculadas analíticamente mediante la distribución lognormal acumulada.

El análisis de los escenarios revela los mecanismos físicos que gobiernan el daño por biodeterioro en los diferentes escenarios de zonas de daño y tipos de muros:

Escenario A (Uniones): La degradación de las conexiones se confirma como el eslabón débil individual en el comportamiento de los modelos, especialmente el muro GHS. Al comprometerse la capacidad de transmisión de esfuerzos por la afectación del biodeterioro en las uniones, se generan caídas de rigidez global, detectadas en el desplazamiento lateral. No obstante, las probabilidades de sobrepasar el límite de servicio DS3 permanecen muy bajas o nulas si el daño es aislado únicamente a las juntas. El rango de deflexiones laterales para este escenario para los 3 modelos está entre su límite base de calibración y su incremento del 25%.

Escenario B (columnas): La penalización del tercio inferior de las columnas incrementa la vulnerabilidad biodeterioro individual más que cualquier otro escenario, para todos los tipos de muros. Por las altas probabilidades de excedencias del límite de servicio DS1, especialmente para los modelos GS y GHS, se puede inferir mayor susceptibilidad ante momento de volcamiento en la base, causando mayor deriva en las soleras superiores. En el peor escenario de daño último por biodeterioro en la base de las columnas, los muros perderían su capacidad de soportar momentos en la base, induciendo un mecanismo de falla por rotación.

Escenario C (diagonales): El impacto del biodeterioro exclusiva de la tercia parte inferior de los elementos diagonales es estadísticamente menor, especialmente para el modelo GHS y GSHS, debido a que el arriostramiento de las latas ayuda a redistribuir las cargas a las columnas. Como en ninguno de los tipos de muros se supera una probabilidad de que se supere el límite de servicio DS1, se puede inferir que las latas distribuyen las fuerzas laterales, evitando que los muros incurran en derivas extremas.

Escenario D (latas): La probabilidad nula (0.00%) en todas las tipologías valida la inmunidad al daño causado por el biodeterioro individual de estos elementos bajo cargas laterales, exclusivamente en el rango lineal, ya que este trabajo no pudo evaluar el comportamiento inelástico de las latas ni el desprendimiento de la tierra de estas para el modelo GSHS. Las latas inferiores en la altura menor a 50 cm a nivel del suelo y sus conexiones asociadas, en su escenario individual, no representan la totalidad de las latas para los muros GHS y GSHS, por lo que los otros elementos al estar sanos, incluidas el resto de las latas, rigidizan el sistema estructural.

Escenario E (Global): La convergencia de todos los escenarios desencadena una respuesta donde se evidencia de manera indiscutible una afectación importante al biodeterioro de los elementos en guadua. El efecto combinado de daño genera un rango de excedencia para el límite

de servicio DS1 entre 39.17% y 44.51%, para el DS2 entre 11.76% y 18.62%, y para el DS3 entre 0.41% y 6.31%. Esto corrobora que, si al muro se le aplican mayores cargas que las establecidas en la calibración, existe la probabilidad del colapso estructural. Hay que tener en cuenta que cuando una estructura de bahareque no se le hace mantenimiento, las probabilidades de que el escenario global se presente son considerables.

4.5 Hallazgos estructurales

4.5.1 Capacidad de relleno de tierra (Escenario A — GHS vs. GSHS)

Bajo el escenario A, el cual aplica daño por biodeterioro exclusivamente a las juntas (Zona 1), el modelo GSHS registró probabilidades de excedencia consistentemente inferiores respecto al modelo GHS. La matriz de relleno del suelo modelada como lecho de resortes de Winkler, acoplada al sistema de adherencia axial de los cimientos, ejerce como disipador de energía adicional que no tiene el modelo sin relleno GHS. Durante el daño aislado en las uniones, el relleno absorbe parcialmente las fuerzas laterales.

4.5.2 Sinergia de daño (Escenario E)

El escenario E representa la degeneración por biodeterioro aleatoria de las cuatro zonas de daño declaradas en el numeral 4.2.2 (Z1, Z2, Z3 y Z4). Este análisis arrojó las probabilidades máximas para cualquier estado límite de servicio evaluado en el proyecto. Específicamente en el modelo GSHS, el Escenario E reporta un 39.17% de probabilidad de sobrepasar el estado de daño DS1. Este valor no corresponde a una suma lineal de las probabilidades de los escenarios individuales, sino que genera una amplificación del daño mayor. Esto demuestra que cuando se ocurren daños conjuntos por biodeterioro la guadua alrededor de las juntas, la base en columnas, las diagonales y las latas, la estructura en bahareque reduce su capacidad de redistribución de cargas, el cual funciona en su estado sano de manera sinérgica debido a sus elementos.

4.5.3 Inmunidad cinemática de las latas

En los modelos compuestos, el análisis exclusivo del Escenario D presentó un coeficiente de variación idéntico a 0.0 para las 100 iteraciones. Las deflexiones laterales se mantuvieron estables frente al biodeterioro de los conectores de las latas inferiores. Para el escenario individual, este

resultado demuestra que las 10 de las 42 latas que componen el muro GHS, bajo el rango lineal, con un rango de daño por biodeterioro entre el 15% y 35% y sin relleno resultan secundarias para el desplazamiento lateral. Otras conclusiones no se pudieron obtener debido a las limitaciones del presente trabajo de grado. No se puede descartar su aporte al confinamiento de la matriz de tierra en el muro GSHS ni su aporte en el rango no lineal para los modelos GHS y GSHS.

4.6 Análisis de anomalías y colas extremas

El algoritmo automatizado detectó un total de 110 instancias singulares o anomalías de deflexión entre la población estocástica total, segregadas fenomenológicamente en infracciones del límite inferior y colas críticas superiores.

4.6.1 Cola inferior: redistribución torsional (Escenario A)

Las violaciones al límite inferior de desplazamiento calibrado para el escenario A y para los 3 tipos de muros evaluados en este proyecto, son el resultado numéricamente válido de una penalización asimétrica y aleatoria generada por el LHS. Al inyectarse daños diferenciados en un eje de la estructura, se traslada el centro de rigideces en planta, lo que induce torsiones geométricas, ya que el pórtico gira sobre su eje vertical y generando acortamientos axiales tridimensionales. Estos giros compensan la medición planar realizada en el sensor $Z=2.10$ m, mostrando “falsos positivos” de rigidización cuando se trata de un mecanismo rotacional y de redistribución. Como se observa en la tabla 14, en todos los tipos de muros para el escenario A, se encontraron este rango similar de anomalías; concluyendo que el biodeterioro puede causar que las conexiones del pórtico en guadua sean propensas a giros en varias direcciones.

Tabla 14 Resumen de concentración de anomalías de límite inferior

Topología	Escenario	Cantidad registrada	Proporción con el total de anomalías
GS	Escenario A	36	100%
GS	Escenario E	2	33%
GHS	Escenario A	28	93%
GSHS	Escenario A	25	100%

Nota. Elaboración propia. La asimetría en el biodeterioro es la principal responsable de la desviación geométrica.

4.6.2 Cola superior: modo de fallo dual de Escenarios B y E

A la inversa, las anomalías superiores representan el sector extremo de la cola probabilística de fallo, excediendo de largo los límites de servicio DS3 establecidos para este trabajo de grado. Estas colas superiores están dictadas mayoritariamente por los Escenarios B (bases de columnas) y E (daño global). El daño por biodeterioro simulado en los empotramientos compromete toda la matriz estática del ensamble, magnificando los picos de desplazamientos laterales por encima del límite de servicio DS3.

Las columnas para los 3 tipos de muros, se modelaron de la misma manera, es decir que se dividen en cada unión con las latas, por lo tanto, hay 15 secciones de columnas afectables por el biodeterioro. para el escenario B. Se detecta una relación entre el número de elementos afectados por el biodeterioro y la deflexión lateral máxima reportada en la tabla 15, especialmente para los escenarios B y E.

Tabla 15 Iteraciones registradas que exceden el límite de servicio DS3 por escenario

Topología	Escenario	No. Registros	rangos de deflexión	Factor D más bajo	Elementos afectados
GS	B	1	2.06 mm	0.2162	7
GS	E	4	2.01 mm a 2.82 mm	0.1188	11
GHS	A	2	14.04 mm a 30.38 mm	0.0417	2
GHS	B	1	19.06 mm	0.1559	8
GHS	E	4	22.00 mm a 36.82 mm	0.0307	13
GSHS	B	2	14.23 mm a 14.88 mm	0.2207	8
GSHS	E	4	15.61 mm a 29.82 mm	0.0135	13

Nota. Elaboración propia. Datos extraídos computacionalmente de las colas de la simulación.

Los desplazamientos más severos en todos los escenarios de los 3 tipos de muros, ocurrieron cuando fueron afectados por los factores de daño de biodeterioro D más bajos. Cuando un factor D está entre los rangos de 0.0134 y 0.0417, se considera el elemento prácticamente destruido por esta patología. En los 3 picos de deflexión máxima reportados en la tabla 15, uno de los casos que presenta mayor daño por biodeterioro (escenario A, GHS) ocurrió en una conexión; para los otros 2 casos (Escenario E, GHS y escenario E, GSHS) el biodeterioro ocurrió en una de sus columnas.

5 CONCLUSIONES Y RECOMENDACIONES

5.1 Conclusiones

- La calibración de los modelos de muros de bahareque usando la modelación por elementos finitos mediante ANSYS y Python, junto con la metodología de linealización elástica secante EEEP, demostró ser una estrategia numéricamente eficiente para definir los variables de los modelos base. Esta aproximación garantizó una caracterización lineal elástica representativa del comportamiento estructural, resolviendo la necesidad de referenciar umbrales de daño confiables sin incurrir en los altos procesamientos computacionales y tiempos de ejecución inherentes a una calibración no-lineal.
- El análisis paramétrico mediante el muestreo LHS probó ser altamente efectivo para simular la aleatoriedad del biodeterioro en el motor de elementos finitos. La convergencia estadística, validada matemáticamente con el diferencial $\Delta COV_{\%}$, se alcanzó de forma satisfactoria y estable en N=100 iteraciones para todas las tipologías estructurales. El estudio demuestra que no es necesario utilizar un muestreo masivo tipo Monte Carlo para lograr capturar el espectro de varianza de sistemas físicos altamente inciertos como la *Guadua angustifolia*.
- La cuantificación de la fragilidad de los muros de bahareque debido al biodeterioro evidencia que la vulnerabilidad máxima de los muros ocurre por el escenario E, donde la falla simultánea y concurrente de uniones y bases supera la suma lineal de sus daños aislados, conduciendo a colapsos cinemáticos acelerados. En contraste, frente a escenarios de daño localizado, el relleno de tierra en los pórticos aporta una mitigación pasiva crucial, brindando a los sistemas GSHS una resiliencia estadísticamente superior frente a las configuraciones GHS. Adicionalmente, el análisis de las anomalías estocásticas expuso el fenómeno de la redistribución torsional en el muro GS, donde las conexiones del pórtico en guadua sean propensas a giros en varias direcciones debido al biodeterioro de la guadua alrededor de los nodos de conexión.

5.2 Respuesta a la hipótesis

El biodeterioro en los elementos de guadua influye directamente en la respuesta cíclica de los muros de bahareque cargados en el plano al degradar de manera progresiva la rigidez del sistema, disminuyendo su capacidad de disipación de energía, generando la pérdida del módulo de elasticidad en los elementos de guadua y su afectación en las condiciones de servicio, acelerando la transición hacia la falla estructural.

La degradación estocástica evidenció que, el biodeterioro en elementos de guadua reduce de forma cuantificable la capacidad de servicio de los muros de bahareque bajo cargas laterales equivalentes, siendo el daño en uniones y bases de columnas los modos más críticos de daño individual de los modelos estudiados. Los hallazgos demuestran que, en todas las tipologías, al aplicar biodeterioro simultáneamente en las cuatro zonas de vulnerabilidad, generó una amplificación sinérgica que superó la superposición lineal de los escenarios individuales.

De otro lado, el daño aleatorio y asimétrico, generado por ataques biológicos y humedad en los elementos de guadua, induce excentricidades y mecanismos de redistribución torsional, comprometiendo la redundancia del pórtico. En los muros compuestos, la matriz de tierra mitiga parcialmente la pérdida de rigidez de la guadua; sin embargo, la degeneración simultánea y sinérgica de múltiples zonas vulnerables reduce esta reserva pasiva.

5.3 Limitaciones del estudio

El marco paramétrico desarrollado es de carácter puramente elástico, lo cual restringe al algoritmo de capturar la degradación cíclica histerética o predecir el colapso físico real definido por los Estados Límite Últimos. La metodología estocástica utilizó una carga estática determinista equivalente sobre los nodos superiores en lugar de aplicar un empuje no-lineal progresivo o un análisis dinámico en el tiempo.

Las probabilidades calculadas para las curvas de fragilidad son de carácter condicional a los umbrales de deflexión adoptados bajo la linealización EEEP y la asignación de los porcentajes de daño en los escenarios, constituyendo una aproximación analítica conservadora frente a la capacidad inelástica sistema real de los muros de bahareque.

5.4 Recomendaciones para investigación futura

- La transición de los modelos lineales hacia la implementación de leyes de daño continuo basadas en la mecánica del daño y parametrización inelástica del software ANSYS es fundamental para poder evaluar probabilísticamente los modos de falla última de los muros de bahareque.
- Resulta necesario efectuar ensayos experimentales de pórticos de guadua a escala real con patologías de daño inducido de forma asimétrica, con el propósito de establecer las probabilidades de daño reales establecidas en los escenarios, así como realizar otros ensayos que establezcan valores calibrables de las rigideces de las conexiones y su comportamiento inelástico.
- Se requiere integrar la matriz de tierra al modelo de elementos finitos no lineales, donde las propiedades del material respondan a comportamiento inelástico de las latas y el desprendimiento de la tierra de estos ante las cargas cíclicas. Esto permitiría evaluar el impacto de la redistribución de esfuerzos y rigidez que ejerce la tierra sobre las estructuras, especialmente en escenarios de daño múltiple y obtener parámetros calibrables que se acerquen a los valores de los ensayos de laboratorio.

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7 ANEXOS

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DESARROLLO DEL APÉNDICE A: SCRIPTS ANSYS

A.1.1 bahareque_base_model.py

```
import os
import numpy as np
from ansys.mapdl.core import launch_mapdl

def setup_bahareque_model(prototype_type='GHS'):
    """
    Initializes the PyMAPDL environment and defines vertical geometry for the
    Bahareque Wall project.
    Z-axis is Vertical (Height). X-axis is Width. Y-axis is Thickness.
    Active prototypes: GS (skeleton), GHS (Guadua+Latas), GSHS (Guadua+Latas+Soil).
    Unit system: SI strict (Pa, kg, m, N). All input values in base SI units.
    Step 12+16: Parametric node grid at Y=0 with NUMMRG continuity and SEC 3/4 dual-
    offset latas.
    """
    valid_types = ['GS', 'GHS', 'GSHS']
    if prototype_type not in valid_types:
        raise ValueError(f"Invalid prototype_type. Choose from {valid_types}")

    print(f"--- Initializing Bahareque Model (Steps 12+16 Topology): {prototype_type}
    ---")

    # Launch MAPDL – isolated run directory per prototype to prevent Windows file loc
    k collisions
    run_dir = os.path.join(os.getcwd(), 'Active_Simulation', prototype_type)
    os.makedirs(run_dir, exist_ok=True)
    mapdl = launch_mapdl(run_location=run_dir, override=True, jobname=f"bahareque_{pr
    otype_type}", loglevel="WARNING")

    try:
        mapdl.clear()
        mapdl.run("/PREP7") # Enter preprocessor

        # --- 1.2: Material Assignments (Uncalibrated Physical Baseline - Step 8.1) -
        --
        # Unit system: SI strict (Pa, kg, m). All values in base units.
        # MAT 1: Sawn Wood - Soleras only.
        # EX = 5.0 GPa = 5.0e9 Pa [Cristancho 2024 / Villalba-Morales et al.]
        # DENS = 600 kg/m3 [NSR-10, Titulo B, Tabla B.3.2-1: Masas de Lo
        s materiales]
        # PRXY = 0.20 [Nominal for structural softwood]
        mapdl.mp('EX', 1, 5.0e9); mapdl.mp('PRXY', 1, 0.20); mapdl.mp('DENS', 1, 60
        0)

        # MAT 2: Guadua angustifolia - Frame posts and diagonals.
        # EX = 9.3 GPa = 9.3e9 Pa [Cristancho 2024, via Villalba-Morales et al. 20
        25]
        # DENS = 508.3 kg/m3 [Cristancho 2024, Section 3.1.3, Page 53]
        # PRXY = 0.35 [Nominal for bamboo culm transverse isotropy]
        mapdl.mp('EX', 2, 9.3e9); mapdl.mp('PRXY', 2, 0.35); mapdl.mp('DENS', 2, 50
        8.3)
```

```

# MAT 3: Guadua angustifolia - Latas (bamboo horizontal strips).
# Same physical material as MAT 2. Separate material ID for element selecti
on traceability.
# EX = 9.3e9 Pa, DENS = 508.3 kg/m3 [same sources as MAT 2]
mapdl.mp('EX', 3, 9.3e9); mapdl.mp('PRXY', 3, 0.35); mapdl.mp('DENS', 3, 50
8.3)

# MAT 4: Fiber-reinforced earth infill (SOLID185). Active only for GSHS proto
type.
# EX = 29 MPa = 29e6 Pa
# DENS = 1441 kg/m3 [Cristancho 2024, Probeta 34 Laboratory measur
ement]
# PRXY = 0.25 [Nominal for earthen materials]
if prototype_type in ['GSHS']:
    mapdl.mp('EX', 4, 29e6); mapdl.mp('PRXY', 4, 0.25); mapdl.mp('DENS', 4,
1441)

# --- 1.3: Geometry Configuration (SI units: m) ---
W_wall = 2.20 # Wall width [m]
H_wall = 2.20 # Wall height [m]
T_fill = 0.05 # Earth fill thickness [m]
L_panel = W_wall / 2 # Mid-panel width [m]
S_lata = 0.10 # Vertical spacing between Latas [m]

# --- Section Definitions (SI units: m) ---
# SEC 1: Guadua culm. CTUBE(r_inner, r_outer).
# r_inner = 0.040 m, r_outer = 0.050 m [Cristancho 2024 specimen geometry]
mapdl.sectype(1, 'BEAM', 'CTUBE', 'GuaduaFrame')
mapdl.secddata(0.04, 0.05)

# SEC 2: Sawn Wood solera. RECT(B, H).
# B = 0.10 m (horizontal width), H = 0.05 m (vertical height)
mapdl.sectype(2, 'BEAM', 'RECT', 'WoodSoleras')
mapdl.secddata(0.10, 0.05)

# SEC 3: Guadua Lata FRONT face (+Y side). RECT(B=0.015, H=0.05) - UPRIGHT.
# SECOFFSET: shifts centroid +0.0575 m in local y (= global Y, out-of-plane
).
# Derivation (Step 12): 0.050 m Guadua outer radius + 0.0075 m half-Lata-th
ickness = 0.0575 m.
# Node stays at Y=0 (shared with post); section renders externally at +Y fa
ce.
mapdl.sectype(3, 'BEAM', 'RECT', 'LataFront')
mapdl.secddata(0.015, 0.05)
mapdl.secoffset('USER', 0.0575, 0)

# SEC 4: Guadua Lata BACK face (-Y side). Identical dimensions, mirrored offs
et.
# SECOFFSET: -0.0575 m in local y (= global -Y face).
# Same node pool as SEC 3 (shared Y=0 nodes). Ensures double-sided Lata top
ology.
mapdl.sectype(4, 'BEAM', 'RECT', 'LataBack')
mapdl.secddata(0.015, 0.05)
mapdl.secoffset('USER', -0.0575, 0)

```

```

mapdl.et(1, 'BEAM188')

# --- PHASE A: Parametric Node Grid (Step 12) ---
# One node per (X_column, Z_level) at Y=0. Shared by posts and latas.
# node_grid[level][xi]: level=Z index (0=base, num_latas=top), xi=X col (0=left, 1=ctr, 2=right)
num_latas = int(H_wall / S_lata)
x_positions = [0.0, L_panel, W_wall]
node_grid = {}
print(" -> Building parametric node grid at Y=0 plane...")
for level in range(num_latas + 1):
    z = round(level * S_lata, 6)
    node_grid[level] = {}
    for xi, xv in enumerate(x_positions):
        nid = mapdl.n(None, xv, 0.0, z)
        node_grid[level][xi] = nid

# --- PHASE A: Subdivided Post Elements (MAT 2 Guadua, SEC 1 CTUBE) ---
# Each post = num_latas short segments stacked vertically.
mapdl.type(1); mapdl.mat(2); mapdl.secnum(1)
for xi in range(3):
    for level in range(num_latas):
        mapdl.e(node_grid[level][xi], node_grid[level + 1][xi])
        # Traceability Mapping: G_C{xi}_L{level}
        mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
        mapdl.esel('S', 'ELEM', '', 'E_MAX')
        mapdl.run(f"CM, G_C{xi}_L{level}, ELEM")

# Diagonal elements: top-left to base-center, top-right to base-center.
# Subdivided into 3 elements each to allow stochastic targeting of the lower
third.
top = num_latas

# Left Diagonal Interpolation
dx_L, dz_L = L_panel - 0.0, 0.0 - H_wall
n_DL_13 = mapdl.n(None, 0.0 + dx_L/3.0, 0.0, H_wall + dz_L/3.0)
n_DL_23 = mapdl.n(None, 0.0 + 2*dx_L/3.0, 0.0, H_wall + 2*dz_L/3.0)

# Left Diagonal Element Creation
mapdl.e(node_grid[top][0], n_DL_13) # Top third
mapdl.e(n_DL_13, n_DL_23) # Middle third
mapdl.e(n_DL_23, node_grid[0][1]) # Bottom third
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-2', 'E_MAX')
mapdl.run("CM, D_L, ELEM")
mapdl.esel('S', 'ELEM', '', 'E_MAX')
mapdl.run("CM, D_L_BOT, ELEM")

# Right Diagonal Interpolation
dx_R, dz_R = L_panel - W_wall, 0.0 - H_wall
n_DR_13 = mapdl.n(None, W_wall + dx_R/3.0, 0.0, H_wall + dz_R/3.0)
n_DR_23 = mapdl.n(None, W_wall + 2*dx_R/3.0, 0.0, H_wall + 2*dz_R/3.0)

# Right Diagonal Element Creation

```

```

mapdl.e(node_grid[top][2], n_DR_13)    # Top third
mapdl.e(n_DR_13, n_DR_23)              # Middle third
mapdl.e(n_DR_23, node_grid[0][1])      # Bottom third
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-2', 'E_MAX')
mapdl.run("CM, D_R, ELEM")
mapdl.esel('S', 'ELEM', '', 'E_MAX')
mapdl.run("CM, D_R_BOT, ELEM")

# Wood Soleras (MAT 1, SEC 2) – base and top horizontal beams.
mapdl.mat(1); mapdl.secnum(2)
mapdl.e(node_grid[0][0], node_grid[0][1]) # Base left-to-center
mapdl.e(node_grid[0][1], node_grid[0][2]) # Base center-to-right
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-1', 'E_MAX')
mapdl.run("CM, S_BASE, ELEM")

mapdl.e(node_grid[top][0], node_grid[top][1]) # Top left-to-center
mapdl.e(node_grid[top][1], node_grid[top][2]) # Top center-to-right
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-1', 'E_MAX')
mapdl.run("CM, S_TOP, ELEM")

# --- PHASE B: Lata Elements at Y=0 (SEC 3 Front / SEC 4 Back) ---
# Both faces share the same node pool. SECOFFSET renders sections at +/-0.057
5 m.
if prototype_type != 'GS':
    print(" -> Creating double-sided latas at shared Y=0 nodes (SEC 3 / SEC
4)...")
    mapdl.type(1); mapdl.mat(3)
    for level in range(1, num_latas): # Exclude base (0) and top (num_latas)
        # Front-face Latas (+Y side via SECOFFSET in SEC 3)
        mapdl.secnum(3)
        mapdl.e(node_grid[level][0], node_grid[level][1])
        mapdl.e(node_grid[level][1], node_grid[level][2])
        mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
        mapdl.esel('S', 'ELEM', '', 'E_MAX-1', 'E_MAX')
        mapdl.run(f"CM, L_F_{level}, ELEM")

        # Back-face Latas (-Y side via SECOFFSET in SEC 4)
        mapdl.secnum(4)
        mapdl.e(node_grid[level][0], node_grid[level][1])
        mapdl.e(node_grid[level][1], node_grid[level][2])
        mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
        mapdl.esel('S', 'ELEM', '', 'E_MAX-1', 'E_MAX')
        mapdl.run(f"CM, L_B_{level}, ELEM")

    # Restore full element selection before Topological Merge
    mapdl.allsel()

    # --- PHASE C: Topological Merge (Step 16 Risk Mitigation) ---
    # Merges coincident nodes within 1e-6 m tolerance. Compresses numbering post-
merge.
    print(" -> Executing NUMMRG + NUMCMP for topological continuity...")
    mapdl.nummrg('NODE', 1e-6)

```

```

mapdl.numcmp('NODE')

# --- PHASE D: Sliced Soil Matrix (SOLID185) - GSHS only ---
if prototype_type in ['GSHS']:
    print(" -> Creating Sliced Earth Matrix for node compatibility...")
    mapdl.et(2, 'SOLID185'); mapdl.type(2); mapdl.mat(4); mapdl.esize(0.1)

    # Pre-calculate Y boundaries (avoid unary minus linter errors)
    Y_min = -(T_fill / 2)
    Y_max = (T_fill / 2)

    for i in range(num_latas):
        z_lo = i * S_lata
        z_hi = (i + 1) * S_lata
        if z_hi > H_wall:
            z_hi = H_wall
        mapdl.block(0, L_panel, Y_min, Y_max, z_lo, z_hi)
        mapdl.block(L_panel, W_wall, Y_min, Y_max, z_lo, z_hi)
    mapdl.vmesh('ALL')

# --- Plotting & Verification ---
print(" -> Generating Visual Verification Plots (Frontal Elevation)...")
active_sim_dir = os.path.join(os.getcwd(), 'Active_Simulation')
os.makedirs(active_sim_dir, exist_ok=True)

mapdl.allsel()

# Node plot with Labels (Elevation XZ)
mapdl.nplot(nnum=True, off_screen=True, cpos='xz',
            screenshot=os.path.join(active_sim_dir, f'geometry_nodes_elevation_{prototype_type}.png'))

# Frame only plot (Elevation XZ)
mapdl.esel('S', 'TYPE', '', 1)
mapdl.eplot(off_screen=True, show_edges=True, cpos='xz',
            screenshot=os.path.join(active_sim_dir, f'geometry_frame_elevation_{prototype_type}.png'))
mapdl.allsel()

# Lata offset verification plot – isometric view confirms 0.0575 m tangency,
no overlap.
if prototype_type != 'GS':
    print(" -> Generating Lata Offset Verification Plot (Isometric /ESHAPE).
    ..")
    mapdl.finish()
    mapdl.run("/POST1")
    mapdl.run('/ESHAPE,1') # Activate solid cross-section shape rendering
    mapdl.allsel()
    mapdl.eplot(off_screen=True, show_edges=True, cpos='iso',
                screenshot=os.path.join(active_sim_dir, f'verification_latas_
rotation_{prototype_type}.png'))
    mapdl.run('/ESHAPE,0') # Reset shape display to default wireframe
    mapdl.run("/PREP7")

# --- Shared Node Verification at (X=0, Z=S_lata) ---

```

```

# Confirms NUMMRG produced exactly ONE node at the first post/Lata inters
ection.
mapdl.nsel('S', 'LOC', 'X', -1e-6, 1e-6)
mapdl.nsel('R', 'LOC', 'Z', S_lata - 1e-6, S_lata + 1e-6)
mapdl.nsel('R', 'LOC', 'Y', -1e-6, 1e-6)
mapdl.run("*GET, shared_count, NODE, 0, COUNT")
mapdl.run("*GET, shared_id, NODE, 0, NUM, MIN")
shared_count = int(mapdl.parameters['shared_count'])
shared_id = int(mapdl.parameters['shared_id'])
print(f" -> Shared Node Check at (X=0, Z={S_lata}): count={shared_count}
, Node ID={shared_id}")
if shared_count != 1:
    print(f" !! WARNING: Expected 1 shared node, found {shared_count}. N
UMMRG may have failed.")
mapdl.allsel()

# Topology verification
mapdl.run("*GET, e_count, ELEM, 0, COUNT")
mapdl.run("*GET, n_count, NODE, 0, COUNT")
e_count = mapdl.parameters['e_count']
n_count = mapdl.parameters['n_count']
print(f" -> Topology Verification: Elements = {int(e_count)}, Nodes = {int(n
_count)}")

# --- TRACEABILITY VERIFICATION (Merged Steps 13 & 17) ---
print(" -> Validating Absolute Traceability Mappings (CM)...")
cm_targets = ['G_C1_L1', 'S_BASE', 'D_L']
if prototype_type != 'GS':
    cm_targets.append('L_F_1')

for cm_name in cm_targets:
    mapdl.run(f"*GET, chk_{cm_name}, COMP, {cm_name}, TYPE")
    status = int(mapdl.parameters[f"chk_{cm_name}"])
    # APDL returns 2 for Element Components.
    if status == 2:
        print(f" [PASS] CM '{cm_name}' verified.")
    else:
        print(f" [FAIL] CM '{cm_name}' not found or invalid type (Status:
{status}).")
    mapdl.allsel()

# Database Logging: Run CMLIST to document component generation to the Log ou
tput
print(f" -> Executing CMLIST for {prototype_type}...")
mapdl.run("CMLIST")

# --- PHASE D: Structural Load Stepping (/SOLU) ---
print(" -> Entering /SOLU for Two-Step Loading (Gravity + Placeholder Latera
l)...")
mapdl.run("/SOLU")
mapdl.nlgeom('ON') # Activate large deflections and stress-stiffening

# 1. Boundary Conditions: Fixed Base
mapdl.cmsel('S', 'S_BASE')
mapdl.nsle('S')

```

```

mapdl.d('ALL', 'ALL')

# Matrix Pre-Flight Check (Elastic Downgrade Enforcement)
etlist_out = mapdl.etlist().upper()
if "COMBIN40" in etlist_out or "COMBIN39" in etlist_out:
    raise Exception("Non-linear spring detected. Matrix sterilized abort.")

# 2. LS1: Gravity Setup
mapdl.allsel()
mapdl.acel(0, 0, 9.81) # Positive Z acceleration mimics downward gravity
mapdl.solve()

# 3. LS2: Placeholder Lateral Displacement (0.01 m UX)
mapdl.cmsel('S', 'S_TOP')
mapdl.nsle('S')
mapdl.d('ALL', 'UX', 0.01)
mapdl.allsel()
mapdl.solve()

# --- PHASE E: Post-Processing & LVDT Profiling (/POST1) ---
print(" -> Entering /POST1 for LCOPER Vector Subtraction and LVDT Profiling.
..")

mapdl.run("/POST1")

mapdl.lcdef(1, 1) # Define load case 1 from results set 1
mapdl.lcdef(2, 2) # Define load case 2 from results set 2
mapdl.lcase(2) # Read load case 2 into database
mapdl.lcoper('SUB', 1) # Subtract load case 1 to zero out gravity

# Data Extraction (LVDT Profiling)
# LVDT 1 (Base - should be approx 0)
mapdl.cmsel('S', 'S_BASE')
mapdl.nsle('S')
ux_base = mapdl.post_processing.nodal_displacement('X')
lvdt_1_val = ux_base.mean() if ux_base.size > 0 else 0.0

# LVDT 2 (Mid-height: Z=0.95 to 1.05m tolerance)
mapdl.nsel('S', 'LOC', 'Z', 0.95, 1.05)
ux_mid = mapdl.post_processing.nodal_displacement('X')
lvdt_2_val = ux_mid.mean() if ux_mid.size > 0 else 0.0

# LVDT 3 (Top)
mapdl.cmsel('S', 'S_TOP')
mapdl.nsle('S')
ux_top = mapdl.post_processing.nodal_displacement('X')
lvdt_3_val = ux_top.max() if ux_top.size > 0 else 0.0

# Output profile
print("\n =====")
print(f" | LATERAL DEFLECTION PROFILE (UX) - {prototype_type}")
print(" =====")
print(f" | LVDT 3 (Top) : {lvdt_3_val:.6f} m")
print(f" | LVDT 2 (Mid) : {lvdt_2_val:.6f} m")
print(f" | LVDT 1 (Base) : {lvdt_1_val:.6f} m")
print(" =====\n")

```

```

        mapdl.allsel()

        # Commit database – MAPDL SAVE uses jobname only; .db lands in the isolated r
un_dir.
        # Physical path: Active_Simulation/{prototype_type}/bahareque_{prototype_type
}.db
        mapdl.finish()
        mapdl.save(f"bahareque_{prototype_type}")
        print(f" -> Database committed: Active_Simulation/{prototype_type}/bahareque
_{prototype_type}.db")

    finally:
        print(" -> Closing MAPDL safely...")
        mapdl.exit()

    return mapdl

if __name__ == "__main__":
    # Execute all three active prototypes sequentially.
    for proto in ['GS', 'GHS', 'GSHS']:
        try:
            setup_bahareque_model(proto)
        except Exception as e:
            print(f"Error running {proto}: {e}")

```

A.1.2 calibration_GHS_v7.py

```

import os, sys, time
import numpy as np
import pandas as pd
from scipy.optimize import minimize_scalar
from ansys.mapdl.core import launch_mapdl

# =====
# CONFIGURATION & FILE PATHS
# =====
WORKSPACE = os.path.abspath(os.path.join(os.path.dirname(__file__), '..', '..', '..')
)
CSV_PATH = os.path.join(WORKSPACE, 'Active_Simulation', 'V_delta_data.csv')
RUN_DIR = os.path.dirname(__file__)
OUT_FILE = os.path.join(RUN_DIR, 'calibration_GHS_v7_result.txt')

# =====
# DATA PARSING & FILTERING
# =====
try:
    data = pd.read_csv(CSV_PATH, sep=';')
except Exception as e:
    print(f"[ERROR] Could not read CSV: {e}")
    sys.exit(1)

all_ghs = data[data['Model_ID'] == 'GHS'].reset_index(drop=True)
mask = all_ghs['Delta_TOP_mm'].abs() <= 8.0

```

```

ghs      = all_ghs[mask].reset_index(drop=True)

if len(ghs) == 0:
    print("[ERROR] No GHS data found in CSV for abs(Delta_TOP) <= 8.0 mm.")
    sys.exit(1)

V_exp_N      = ghs['V_max_kN'].values * 1e3
Delta_TOP_exp = ghs['Delta_TOP_mm'].values * 1e-3
cycles       = ghs['Cycle_Index'].values

print(f"Loaded {len(ghs)} GHS data points (|Delta_TOP| <= 8.0 mm).")

# =====
# MAPDL GEOMETRY & SOLVE
# =====
def build_ghs_geometry(mapdl, ke_N_per_m_init):
    W, H, S = 2.20, 2.20, 0.10
    L = W / 2.0
    NL = int(round(H / S))      # = 22
    XP = [0.0, L, W]

    mapdl.clear()
    mapdl.run("/PREP7")

    # Materials
    mapdl.mp('EX', 1, 5.0e9); mapdl.mp('PRXY', 1, 0.20); mapdl.mp('DENS', 1, 600.0)
    mapdl.mp('EX', 2, 9.3e9); mapdl.mp('PRXY', 2, 0.35); mapdl.mp('DENS', 2, 508.3)
    mapdl.mp('EX', 3, 9.3e9); mapdl.mp('PRXY', 3, 0.35); mapdl.mp('DENS', 3, 508.3)

    # Sections
    mapdl.sectype(1, 'BEAM', 'CTUBE', 'GuaduaFrame'); mapdl.secddata(0.04, 0.05)
    mapdl.sectype(2, 'BEAM', 'RECT', 'WoodSoleras'); mapdl.secddata(0.10, 0.05)
    mapdl.sectype(3, 'BEAM', 'RECT', 'LataFront'); mapdl.secddata(0.015, 0.05); mapdl
    .secoffset('USER', 0.0575, 0)
    mapdl.sectype(4, 'BEAM', 'RECT', 'LataBack'); mapdl.secddata(0.015, 0.05); mapdl
    .secoffset('USER', -0.0575, 0)

    # Element types
    mapdl.et(1, 'BEAM188')
    mapdl.et(2, 'COMBIN14', kop2=1)

    # Real constant for COMBIN14
    mapdl.r(1, ke_N_per_m_init)

    # Nodes - Post Grid
    post_grid = {}
    for lv in range(NL + 1):
        z = round(lv * S, 6)
        post_grid[lv] = {}
        for xi, xv in enumerate(XP):
            post_grid[lv][xi] = mapdl.n(None, xv, 0.0, z)

    # Nodes - Lata Grid
    lata_grid = {}
    for lv in range(1, NL):

```

```

    z = round(lv * S, 6)
    lata_grid[lv] = {}
    for xi, xv in enumerate(XP):
        lata_grid[lv][xi] = mapdl.n(None, xv, 0.0, z)

# Nodes - Top Solera & Diagonals (GS Logic)
top_solera = [mapdl.n(None, 0.0, 0.0, H),
              mapdl.n(None, L, 0.0, H),
              mapdl.n(None, W, 0.0, H)]

diag_L_top = mapdl.n(None, 0.0, 0.0, H)
diag_L_bot = mapdl.n(None, L, 0.0, 0.0)
diag_R_top = mapdl.n(None, W, 0.0, H)
diag_R_bot = mapdl.n(None, L, 0.0, 0.0)

# Elements - Posts
mapdl.type(1); mapdl.mat(2); mapdl.secnum(1)
for xi in range(3):
    for lv in range(NL):
        mapdl.e(post_grid[lv][xi], post_grid[lv+1][xi])

# Elements - Diagonals (Subdivided into 3 elements each)
mapdl.type(1); mapdl.mat(2); mapdl.secnum(1)

# Left Diagonal Interpolation
dx_L, dz_L = L - 0.0, 0.0 - H
n_DL_13 = mapdl.n(None, 0.0 + dx_L/3.0, 0.0, H + dz_L/3.0)
n_DL_23 = mapdl.n(None, 0.0 + 2*dx_L/3.0, 0.0, H + 2*dz_L/3.0)

# Left Diagonal Element Creation
mapdl.e(diag_L_top, n_DL_13)           # Top third
mapdl.e(n_DL_13, n_DL_23)             # Middle third
mapdl.e(n_DL_23, diag_L_bot)          # Bottom third
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-2', 'EM')
mapdl.run("CM, D_L, ELEM")
mapdl.esel('S', 'ELEM', '', 'EM')
mapdl.run("CM, D_L_BOT, ELEM")

# Right Diagonal Interpolation
dx_R, dz_R = L - W, 0.0 - H
n_DR_13 = mapdl.n(None, W + dx_R/3.0, 0.0, H + dz_R/3.0)
n_DR_23 = mapdl.n(None, W + 2*dx_R/3.0, 0.0, H + 2*dz_R/3.0)

# Right Diagonal Element Creation
mapdl.e(diag_R_top, n_DR_13)           # Top third
mapdl.e(n_DR_13, n_DR_23)             # Middle third
mapdl.e(n_DR_23, diag_R_bot)          # Bottom third
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-2', 'EM')
mapdl.run("CM, D_R, ELEM")
mapdl.esel('S', 'ELEM', '', 'EM')
mapdl.run("CM, D_R_BOT, ELEM")

# Elements - Base solera

```

```

mapdl.mat(1); mapdl.secnum(2)
mapdl.e(post_grid[0][0], post_grid[0][1])
mapdl.e(post_grid[0][1], post_grid[0][2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
mapdl.run("CM, S_BASE, ELEM")

# Elements - Top solera
mapdl.e(top_solera[0], top_solera[1])
mapdl.e(top_solera[1], top_solera[2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
mapdl.run("CM, S_TOP, ELEM")

# Elements - Lata
mapdl.type(1); mapdl.mat(3)
for lv in range(1, NL):
    for sec in [3, 4]:
        mapdl.secnum(sec)
        mapdl.e(lata_grid[lv][0], lata_grid[lv][1])
        mapdl.e(lata_grid[lv][1], lata_grid[lv][2])

# CP constraints & COMBIN14 springs
cp_num = 1

def bind_nodes(nodes_list, dofs=None):
    nonlocal cp_num
    if dofs is None:
        dofs = ['UY', 'UZ', 'ROTX', 'ROTY', 'ROTZ']
    for dof in dofs:
        if len(nodes_list) == 2:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1])
        elif len(nodes_list) == 3:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1], nodes_list[2])
        cp_num += 1

# Lata CPs (Freed ROTY and ROTZ to avoid over stiffness - Vierendeel Error Correction)
for lv in range(1, NL):
    for xi in range(3):
        pn = post_grid[lv][xi]
        ln = lata_grid[lv][xi]
        bind_nodes([pn, ln], dofs=['UY', 'UZ', 'ROTX'])

# Lata Springs
mapdl.type(2); mapdl.real(1)
for lv in range(1, NL):
    for xi in range(3):
        mapdl.e(post_grid[lv][xi], lata_grid[lv][xi])

# Frame Connections (Inject GS Logic) - Frame connections couple all 5 DOFs
# Joint 0: Top Left (Solera, Post, Diagonal)
bind_nodes([top_solera[0], post_grid[NL][0], diag_L_top])
mapdl.e(top_solera[0], post_grid[NL][0])
mapdl.e(top_solera[0], diag_L_top)

```

```

# Joint 1: Top Center (Solera, Post)
bind_nodes([top_solera[1], post_grid[NL][1]])
mapdl.e(top_solera[1], post_grid[NL][1])

# Joint 2: Top Right (Solera, Post, Diagonal)
bind_nodes([top_solera[2], post_grid[NL][2], diag_R_top])
mapdl.e(top_solera[2], post_grid[NL][2])
mapdl.e(top_solera[2], diag_R_top)

# Joint 3: Bottom Center (Rigid Base, Left Diag, Right Diag)
bind_nodes([post_grid[0][1], diag_L_bot, diag_R_bot])
mapdl.e(post_grid[0][1], diag_L_bot)
mapdl.e(post_grid[0][1], diag_R_bot)

mapdl.allsel()
return post_grid, lata_grid, top_solera, NL

mapdl = launch_mapdl(run_location=RUN_DIR, override=True, jobname="calib_GHS_v7", log
level="ERROR")

post_grid, lata_grid, top_solera, NL = build_ghs_geometry(mapdl, 500000.0)

# Set BCs
mapdl.run("/SOLU")
mapdl.antype('STATIC')
mapdl.nlgeom('OFF')
mapdl.cmsel('S', 'S_BASE'); mapdl.nsle('S')
mapdl.d('ALL', 'ALL')
mapdl.allsel()
mapdl.finish()

iter_count = [0]

def solve_for_ke(ke_N_per_mm, is_validation=False):
    ke_N_per_m = ke_N_per_mm * 1000.0

    # Update spring stiffness
    mapdl.run("/PREP7")
    mapdl.r(1, ke_N_per_m)

    if is_validation:
        # Full loop for validation output and image
        mapdl.run("/SOLU")
        rmse_sq = 0.0
        val_rows = []

        def get_mean_ux(level):
            vals = []
            for xi in range(3):
                n_id = post_grid[level][xi]
                mapdl.run(f"*GET, UX_VAL, NODE, {n_id}, U, X")
                vals.append(mapdl.parameters['UX_VAL'])
            return np.mean(vals)

```

```

for i, V_N in enumerate(V_exp_N):
    mapdl.fdelete('ALL', 'ALL')
    for n in top_solera:
        mapdl.f(n, 'FX', V_N / 3.0)
    mapdl.solve()

    mapdl.run("/POST1")
    mapdl.set('LAST')

    ux_fem = get_mean_ux(21)
    exp_m = Delta_TOP_exp[i]
    err_m = ux_fem - exp_m
    rmse_sq += err_m**2

    dMID_fem = get_mean_ux(11) * 1000.0
    dBOT_fem = get_mean_ux(0) * 1000.0
    val_rows.append((cycles[i], V_N/1e3, exp_m*1000.0, ux_fem*1000.0, err_m*1
000.0, dMID_fem, dBOT_fem))

    mapdl.run("/SOLU")

    rmse_mm = np.sqrt(rmse_sq / len(V_exp_N)) * 1000.0

    mapdl.run("/POST1")
    mapdl.set('LAST')
    img_path = os.path.join(RUN_DIR, 'GHS_v7_Deformed_Shape.png')
    mapdl.post_processing.plot_nodal_displacement('X', show_displacement=True, di
splacement_factor=20,
                                                    show_edges=True, render_lines_a
s_tubes=False,
                                                    cpos='xz', off_screen=True, sav
efig=img_path)

    table_str = ""
    table_str += " Per-point validation (ke={:.2f}): \n".format(ke_N_per_mm)
    table_str += " Pt | V(kN) | dTOP_exp | dTOP_fem | err(mm) | dMID
_fem | dBOT_fem \n"
    table_str += " " + "-"*76 + "\n"
    for r in val_rows:
        table_str += f" {r[0]:>3} | {r[1]:>9.5f} | {r[2]:>10.4f} | {r[3]:>10.4f}
| {r[4]:>8.4f} | {r[5]:>10.4f} | {r[6]:>10.4f} \n"

    return rmse_mm, table_str

else:
    # Fast analytic solve for optimization loop
    mapdl.run("/SOLU")
    mapdl.fdelete('ALL', 'ALL')
    F_ref = 1.0 / 3.0
    for n in top_solera:
        mapdl.f(n, 'FX', F_ref)
    mapdl.solve()

    mapdl.run("/POST1")
    mapdl.set(1, 1)

```

```

vals = []
for xi in range(3):
    n_id = post_grid[21][xi] # Level 21 is Z=2.10
    mapdl.run(f"*GET, UX_VAL, NODE, {n_id}, U, X")
    vals.append(mapdl.parameters['UX_VAL'])
c_TOP = np.mean(vals)

dTOP_fem = V_exp_N * c_TOP
rmse_mm = float(np.sqrt(np.mean((dTOP_fem - Delta_TOP_exp)**2))) * 1e3

iter_count[0] += 1
if iter_count[0] <= 5 or iter_count[0] % 5 == 0:
    print(f" [Iter {iter_count[0]:>3}] Trial ke = {ke_N_per_mm:>8.2f} N/mm
--> RMSE = {rmse_mm:.4f} mm")

    return rmse_mm

# =====
# EXECUTION
# =====
if __name__ == "__main__":
    if True:
        print("="*60)
        print(" GHS MODEL KE CALIBRATION V7 (CORRECTED KINEMATICS)")
        print("="*60)

        print("Running initial sanity check at ke = 775 N/mm...")
        t0 = time.time()
        rmse_test = solve_for_ke(775.0)

        print("\nStarting Scipy Optimization (Bounded 50-1500)...")
        res = minimize_scalar(
            solve_for_ke,
            bounds=(50, 1500),
            method='bounded',
            options={'xatol': 1.0}
        )

        opt_ke = res.x
        opt_rmse = res.fun

        print("="*60)
        print(f" OPTIMIZATION COMPLETE in {time.time()-t0:.1f}s")
        print(f" Optimal ke = {opt_ke:.2f} N/mm")
        print(f" Minimum RMSE = {opt_rmse:.4f} mm")
        print("="*60)

        print("\nRunning final validation and image generation...")
        final_rmse, val_table = solve_for_ke(opt_ke, is_validation=True)

        res_str = ""
        res_str += "GHS CALIBRATION RESULT V7\n"
        res_str += f"ke_calibrated = {opt_ke:.2f} N/mm\n"
        res_str += f"RMSE (TOP) = {final_rmse:.4f} mm\n"

```

```

res_str += f"N points      = {len(ghs)}\n"
res_str += f"EX (fixed)     = 9.3 GPa (Guadua)\n"
res_str += f"Iterations      = {iter_count[0]}\n"
res_str += "=====\n\n"
res_str += val_table

print("\n" + res_str)

with open(OUT_FILE, 'w') as f:
    f.write(res_str)

print(f"\nResults saved to: {OUT_FILE}")
print(f"Deformation plot saved to: Active_Simulation/GHS/Calibration_1.6/GHS_
v7_Deformed_Shape.png")

mapdl.exit()

```

A.1.3 calibration_GSHS_v6.py

```

import os, sys, time
import numpy as np
import pandas as pd
from scipy.optimize import minimize_scalar
from ansys.mapdl.core import launch_mapdl

# =====
# CONFIGURATION & FILE PATHS
# =====
WORKSPACE = os.path.abspath(os.path.join(os.path.dirname(__file__), '..', '..', '..')
)
sys.path.append(WORKSPACE)
from pymapdl_macro_connections_v6 import build_simplified_gshs_model

CSV_PATH = os.path.join(WORKSPACE, 'Active_Simulation', 'V_delta_data.csv')
RUN_DIR = os.path.dirname(__file__)
OUT_FILE = os.path.join(RUN_DIR, 'calibration_GSHS_v6_result.txt')

# =====
# CONSTANTS (V6 - FULLY LINEAR EQUIVALENT)
# =====
K_BOND_FIXED = 1.0      # [N/m/m]
KE_N_PER_M = 259.02e3   # Lata Slip Modulus [N/m] - FIXED (259.02 N/mm from GHS)

# =====
# DATA PARSING & FILTERING
# =====
try:
    data = pd.read_csv(CSV_PATH, sep=';')
except Exception as e:
    print(f"[ERROR] Could not read CSV: {e}")
    sys.exit(1)

all_gshs = data[data['Model_ID'] == 'GSHS'].reset_index(drop=True)
mask      = all_gshs['Delta_TOP_mm'].abs() <= 8.0

```

```

gshs      = all_gshs[mask].reset_index(drop=True)

if len(gshs) == 0:
    print("[ERROR] No GSHS data found in CSV for abs(Delta_TOP) <= 8.0 mm.")
    sys.exit(1)

V_exp_N      = gshs['V_max_kN'].values * 1e3
Delta_TOP_exp = gshs['Delta_TOP_mm'].values * 1e-3
cycles       = gshs['Cycle_Index'].values

print(f"Loaded {len(gshs)} GSHS data points (|Delta_TOP| <= 8.0 mm).")

# =====
# MAPDL LAUNCH
# =====
mapdl = launch_mapdl(run_location=RUN_DIR, override=True, jobname="calib_GSHS_v6", log_level="ERROR")

iter_count = [0]

# =====
# OPTIMIZATION OBJECTIVE
# =====
def solve_for_ex_soil(trial_EX_soil, is_validation=False):
    """
    Optimization objective function for V6 (Fully Linear Equivalent model).
    Rebuilds the full model from scratch per trial.
    k_bond is fixed.
    """
    ks_modulus = trial_EX_soil / 2.20

    if not is_validation:
        print(f"\n--- STARTING TRIAL: trial_EX_soil = {trial_EX_soil/1e6:.4f} MPa ---")

    mapdl.clear()

    _pg, _ts, _NL = build_simplified_gshs_model(mapdl, ks_modulus, K_BOND_FIXED)

    if is_validation:
        mapdl.run("/SOLU")
        mapdl.antype('STATIC')
        mapdl.nlgeom('OFF')
        rmse_sq = 0.0

        dTOP_fem_arr = []
        dMID_fem_arr = []
        dBOT_fem_arr = []
        err_arr = []

        def get_mean_ux(level):
            vals = []
            for xi in range(3):
                n_id = _pg[level][xi]
                mapdl.run(f"*GET, UX_VAL, NODE, {n_id}, U, X")

```

```

        vals.append(mapdl.parameters['UX_VAL'])
    return np.mean(vals)

for i, V_N in enumerate(V_exp_N):
    mapdl.fdelete('ALL', 'ALL')
    for n in _ts:
        mapdl.f(n, 'FX', V_N / 3.0)
    mapdl.solve()

    mapdl.run("/POST1")
    mapdl.set('LAST')

    ux_fem = get_mean_ux(21)
    exp_m = Delta_TOP_exp[i]
    err_m = ux_fem - exp_m
    rmse_sq += err_m ** 2

    dMID_fem = get_mean_ux(11) * 1000.0
    dBOT_fem = get_mean_ux(0) * 1000.0

    dTOP_fem_arr.append(ux_fem * 1000.0)
    err_arr.append(err_m * 1000.0)
    dMID_fem_arr.append(dMID_fem)
    dBOT_fem_arr.append(dBOT_fem)

    mapdl.run("/SOLU")

rmse_mm = np.sqrt(rmse_sq / len(V_exp_N)) * 1000.0

mapdl.run("/POST1")
mapdl.set('LAST')
img_path = os.path.join(RUN_DIR, 'GSHS_v6_Deformed_Shape.png')
mapdl.post_processing.plot_nodal_displacement(
    'X', show_displacement=True, displacement_factor=20,
    show_edges=True, render_lines_as_tubes=False,
    cpos='xz', off_screen=True, savefig=img_path)

return rmse_mm, np.array(dTOP_fem_arr), np.array(err_arr), np.array(dMID_fem_
arr), np.array(dBOT_fem_arr)

else:
    # Fast scalar solve for Scipy optimizer
    mapdl.run("/SOLU")
    mapdl.antype('STATIC')
    mapdl.nlgeom('OFF')
    mapdl.fdelete('ALL', 'ALL')
    F_ref = 1.0 / 3.0
    for n in _ts:
        mapdl.f(n, 'FX', F_ref)
    print("[ANSYS] Solving linear load steps...")
    mapdl.solve()

    mapdl.run("/POST1")
    mapdl.set('LAST')

```

```

vals = []
for xi in range(3):
    n_id = _pg[21][xi]
    mapdl.run(f"*GET, UX_VAL, NODE, {n_id}, U, X")
    vals.append(mapdl.parameters['UX_VAL'])
c_TOP = np.mean(vals)

# Superposition and scaling logic is valid ONLY under this linear regime
dTOP_fem_abs = float(abs(np.mean(V_exp_N) * c_TOP)) * 1e3
dTOP_fem      = V_exp_N * c_TOP

iter_count[0] += 1
print(f" [Iter {iter_count[0]:>3}] trial_EX_soil={trial_EX_soil/1e6:>8.4f} M
Pa | "

        f"c_TOP={c_TOP:.6e} m | mean|dTOP|={dTOP_fem_abs:.6f} mm")

rmse_mm = float(np.sqrt(np.mean((dTOP_fem - Delta_TOP_exp) ** 2))) * 1e3
print(f"[RESULT] Trial completed. RMSE = {rmse_mm:.4f}\n")

return rmse_mm

# =====
# EXECUTION
# =====
if __name__ == "__main__":
    print("=" * 60)
    print(" GSHS V6 - FULLY LINEAR EQUIVALENT CALIBRATION")
    print(f" k_bond FIXED = {K_BOND_FIXED:.2f} N/m/m | ke FIXED = {KE_N_PER_M/1e3:.2
f} N/mm")
    print("=" * 60)

    res = minimize_scalar(
        solve_for_ex_soil, bounds=(1e5, 29e6),
        method='bounded', options={'xatol': 1.0}
    )

    optimal_EX_soil = res.x
    final_rmse      = res.fun

    print(f"\nOptimization complete. Optimal trial_EX_soil = {optimal_EX_soil/1e6:.4f
} MPa")
    print(f"Final RMSE = {final_rmse:.4f} mm")

    # -----
    # FINAL VALIDATION PASS
    # -----
    print("\n[VALIDATION] Running validation pass with optimal EX_soil...")
    rmse_mm, dTOP_fem_arr, err_arr, dMID_fem_arr, dBOT_fem_arr = solve_for_ex_soil(op
timal_EX_soil, is_validation=True)

    optimal_ks_modulus = optimal_EX_soil / 2.20

    header = (
        f"\n{'=' * 60}\n"

```

```

f"  GSHS CALIBRATION RESULT V6\n"
f"  ke FIXED          = {KE_N_PER_M/1e3:.2f} N/mm\n"
f"  EX_soil_calibrated= {optimal_EX_soil/1e6:.2f} MPa\n"
f"  ks_calibrated     = {optimal_ks_modulus/1e6:.2f} MN/m^3\n"
f"  RMSE (TOP)        = {final_rmse:.4f} mm\n"
f"  k_bond (fixed)     = {K_BOND_FIXED:.2f} N/m/m\n"
f"  N points           = {len(V_exp_N)}\n"
f"  Iterations         = {iter_count[0]}\n"
f"{'=' * 60}\n"
f"  Pt |      V(kN) |      dTOP_exp |      dTOP_fem |      err(mm) |      dMID_fem |      dBOT
_fem\n"
f"{'-' * 80}"
)
print(header)

table_lines = []
for i in range(len(V_exp_N)):
    V_exp_kN = V_exp_N[i] / 1e3
    dTOP_exp = Delta_TOP_exp[i] * 1e3
    dTOP_fem = dTOP_fem_arr[i]
    err       = err_arr[i]
    dMID_fem  = dMID_fem_arr[i]
    dBOT_fem  = dBOT_fem_arr[i]
    line = (f"      {i+1:>2} | {V_exp_kN:>8.2f} | {dTOP_exp:>10.4f} | {dTOP_fem:>10.
4f} | "
            f"{err:>8.4f} | {dMID_fem:>10.4f} | {dBOT_fem:>10.4f}")
    print(line)
    table_lines.append(line)

print("=" * 60)

# Save to file
with open(OUT_FILE, 'w') as f:
    f.write(header + "\n")
    for line in table_lines:
        f.write(line + "\n")
    f.write("=" * 60 + "\n")

mapdl.exit()

```

A.1.4 calibration_GS_v3.py

```

import os, sys, time
import numpy as np
import pandas as pd
from scipy.optimize import minimize_scalar
from ansys.mapdl.core import launch_mapdl

# =====
# CONFIGURATION & FILE PATHS
# =====
WORKSPACE = os.path.abspath(os.path.join(os.path.dirname(__file__), '..', '..', '..'))
)
CSV_PATH = os.path.join(WORKSPACE, 'Active_Simulation', 'V_delta_data.csv')

```

```

RUN_DIR    = os.path.dirname(__file__)
OUT_FILE   = os.path.join(RUN_DIR, 'calibration_GS_v3_result.txt')

# =====
# PHASE A & B: DATA PARSING & FILTERING
# =====
try:
    data = pd.read_csv(CSV_PATH, sep=';')
except Exception as e:
    print(f"[ERROR] Could not read CSV: {e}")
    sys.exit(1)

all_gs = data[data['Model_ID'] == 'GS'].reset_index(drop=True)
mask    = all_gs['Delta_TOP_mm'].abs() <= 1.0
gs      = all_gs[mask].reset_index(drop=True)

if len(gs) == 0:
    print("[ERROR] No GS data found in CSV for abs(Delta_TOP) <= 1.0 mm.")
    sys.exit(1)

V_exp_N      = gs['V_max_kN'].values * 1e3
Delta_TOP_exp = gs['Delta_TOP_mm'].values * 1e-3
cycles       = gs['Cycle_Index'].values

print(f"Loaded {len(gs)} GS data points (|Delta_TOP| <= 1.0 mm).")

# =====
# PHASE C & D: MAPDL SOLVER FUNCTION
# =====
mapdl = launch_mapdl(run_location=RUN_DIR, override=True, jobname="calib_GS_v3", logl
evel="ERROR")

def solve_for_ke(ke_trial_N_mm, is_validation=False):
    """
    Executes a full MAPDL session to calculate the RMSE of Delta_TOP
    for a given ke trial value using Stage C Topology with subdivided diagonals.
    """
    mapdl.clear()
    mapdl.run("/PREP7")

    # 1. Geometry Parameters
    W_wall, H_wall, S_lata = 2.20, 2.20, 0.10
    L_panel = W_wall / 2.0
    NL = int(H_wall / S_lata)

    # 2. Material & Section Properties
    # EX permanently fixed at literature values
    mapdl.mp('EX', 1, 5.0e9); mapdl.mp('PRXY', 1, 0.20); mapdl.mp('DENS', 1, 600) #
Wood
    mapdl.mp('EX', 2, 9.3e9); mapdl.mp('PRXY', 2, 0.35); mapdl.mp('DENS', 2, 508.3) #
Guadua

    mapdl.sectype(1, 'BEAM', 'CTUBE', 'GuaduaFrame'); mapdl.secddata(0.04, 0.05)
    mapdl.sectype(2, 'BEAM', 'RECT', 'WoodSoleras'); mapdl.secddata(0.10, 0.05)

```

```

mapdl.et(1, 'BEAM188')
mapdl.et(2, 'COMBIN14', kop2=1) # 1-D Longitudinal spring (UX slip)

# ke unit correction: [N/mm] to [N/m]
ke_N_m = ke_trial_N_mm * 1000.0
mapdl.real(1)
mapdl.r(1, ke_N_m) # R1 = ke

# 3. Node Generation (Stage C Topology)
# Base Grid (Posts and Inferior Solera)
node_grid = {}
for level in range(NL + 1):
    z = round(level * S_lata, 6)
    node_grid[level] = {}
    for xi, xv in enumerate([0.0, L_panel, W_wall]):
        node_grid[level][xi] = mapdl.n(None, xv, 0.0, z)

# Separated Nodes for Top Solera
top_solera = [mapdl.n(None, 0.0, 0.0, H_wall),
              mapdl.n(None, L_panel, 0.0, H_wall),
              mapdl.n(None, W_wall, 0.0, H_wall)]

# Separated Nodes for Diagonals
diag_L_top = mapdl.n(None, 0.0, 0.0, H_wall)
diag_L_bot = mapdl.n(None, L_panel, 0.0, 0.0)
diag_R_top = mapdl.n(None, W_wall, 0.0, H_wall)
diag_R_bot = mapdl.n(None, L_panel, 0.0, 0.0)

# 4. Element Generation
# Posts (Base to NL-1)
mapdl.type(1); mapdl.mat(2); mapdl.secnum(1)
for xi in range(3):
    for level in range(NL):
        mapdl.e(node_grid[level][xi], node_grid[level + 1][xi])

# Bottom Solera
mapdl.mat(1); mapdl.secnum(2)
mapdl.e(node_grid[0][0], node_grid[0][1])
mapdl.e(node_grid[0][1], node_grid[0][2])

# Top Solera
mapdl.e(top_solera[0], top_solera[1])
mapdl.e(top_solera[1], top_solera[2])

# Diagonals (Subdivided into 3 elements each)
mapdl.type(1); mapdl.mat(2); mapdl.secnum(1)

# Left Diagonal Interpolation
dx_L, dz_L = L_panel - 0.0, 0.0 - H_wall
n_DL_13 = mapdl.n(None, 0.0 + dx_L/3.0, 0.0, H_wall + dz_L/3.0)
n_DL_23 = mapdl.n(None, 0.0 + 2*dx_L/3.0, 0.0, H_wall + 2*dz_L/3.0)

# Left Diagonal Element Creation
mapdl.e(diag_L_top, n_DL_13) # Top third
mapdl.e(n_DL_13, n_DL_23) # Middle third

```

```

mapdl.e(n_DL_23, diag_L_bot)           # Bottom third
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-2', 'E_MAX')
mapdl.run("CM, D_L, ELEM")
mapdl.esel('S', 'ELEM', '', 'E_MAX')
mapdl.run("CM, D_L_BOT, ELEM")

# Right Diagonal Interpolation
dx_R, dz_R = L_panel - W_wall, 0.0 - H_wall
n_DR_13 = mapdl.n(None, W_wall + dx_R/3.0, 0.0, H_wall + dz_R/3.0)
n_DR_23 = mapdl.n(None, W_wall + 2*dx_R/3.0, 0.0, H_wall + 2*dz_R/3.0)

# Right Diagonal Element Creation
mapdl.e(diag_R_top, n_DR_13)           # Top third
mapdl.e(n_DR_13, n_DR_23)             # Middle third
mapdl.e(n_DR_23, diag_R_bot)          # Bottom third
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-2', 'E_MAX')
mapdl.run("CM, D_R, ELEM")
mapdl.esel('S', 'ELEM', '', 'E_MAX')
mapdl.run("CM, D_R_BOT, ELEM")

mapdl.allsel()

# 5. Connection Logic (CP + COMBIN14)
mapdl.type(2); mapdl.real(1)
cp_num = 1

def bind_nodes(nodes_list):
    nonlocal cp_num
    # Orthogonal stability (preventing APDL moment release instabilities)
    for dof in ['UY', 'UZ', 'ROTX', 'ROTY', 'ROTZ']:
        if len(nodes_list) == 2:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1])
        elif len(nodes_list) == 3:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1], nodes_list[2])
        cp_num += 1

# Joint 0: Top Left (Solera, Post, Diagonal)
bind_nodes([top_solera[0], node_grid[NL][0], diag_L_top])
mapdl.e(top_solera[0], node_grid[NL][0]) # UX Spring
mapdl.e(top_solera[0], diag_L_top)       # UX Spring

# Joint 1: Top Center (Solera, Post)
bind_nodes([top_solera[1], node_grid[NL][1]])
mapdl.e(top_solera[1], node_grid[NL][1])

# Joint 2: Top Right (Solera, Post, Diagonal)
bind_nodes([top_solera[2], node_grid[NL][2], diag_R_top])
mapdl.e(top_solera[2], node_grid[NL][2])
mapdl.e(top_solera[2], diag_R_top)

# Joint 3: Bottom Center (Rigid Base, Left Diag, Right Diag)
bind_nodes([node_grid[0][1], diag_L_bot, diag_R_bot])
mapdl.e(node_grid[0][1], diag_L_bot)

```

```

mapdl.e(node_grid[0][1], diag_R_bot)

# 6. Load Stepping (Linear Elastic Scope)
mapdl.run("/SOLU")
mapdl.antype('STATIC')
mapdl.nlgeom('OFF') # Nonlinear elements out of scope

for xi in range(3):
    mapdl.d(node_grid[0][xi], 'ALL')

rmse_sq = 0.0
val_rows = []

def get_mean_ux(level):
    vals = []
    for xi in range(3):
        n_id = node_grid[level][xi]
        mapdl.run(f"*GET, UX_VAL, NODE, {n_id}, U, X")
        vals.append(mapdl.parameters['UX_VAL'])
    return np.mean(vals)

for i, V_N in enumerate(V_exp_N):
    for n in top_solera:
        mapdl.f(n, 'FX', V_N / 3.0)
    mapdl.solve()

    mapdl.run("/POST1")
    mapdl.set('LAST')

    ux_fem = get_mean_ux(21) # Z=2.10m

    exp_m = Delta_TOP_exp[i]
    err_m = ux_fem - exp_m
    rmse_sq += err_m**2

    if is_validation:
        dMID_fem = get_mean_ux(11) * 1000.0 # Z=1.10m
        dBOT_fem = get_mean_ux(0) * 1000.0 # Z=0.0m
        val_rows.append((cycles[i], V_N/1e3, exp_m*1000.0, ux_fem*1000.0, err_m*1
000.0, dMID_fem, dBOT_fem))

    mapdl.run("/SOLU") # Return to SOLU for next loop iteration

rmse_mm = np.sqrt(rmse_sq / len(V_exp_N)) * 1000.0

if not is_validation:
    print(f" [Iter] Trial ke = {ke_trial_N_mm:>8.2f} N/mm --> RMSE = {rmse_mm:
.4f} mm")
    return rmse_mm
else:
    mapdl.run("/POST1")
    mapdl.set('LAST')
    img_path = os.path.join(RUN_DIR, 'GS_v3_Deformed_Shape.png')
    mapdl.post_processing.plot_nodal_displacement('X', show_displacement=True, di
splacement_factor=20,

```

```

s_tubes=True,
efig=img_path)

        table_str = ""
        table_str += " Per-point validation (ke={:.2f}):".format(ke_trial_N_mm)
        table_str += " Pt | V(kN) | dTOP_exp | dTOP_fem | err(mm) | dMID
_fem | dBOT_fem\n"
        table_str += " " + "-"*76 + "\n"
        for r in val_rows:
            table_str += f" {r[0]:>3} | {r[1]:>9.5f} | {r[2]:>10.4f} | {r[3]:>10.4f}
| {r[4]:>8.4f} | {r[5]:>10.4f} | {r[6]:>10.4f}\n"

        return rmse_mm, table_str

# =====
# PHASE E: EXECUTION
# =====
if __name__ == "__main__":
    print("="*60)
    print(" GS MODEL KE CALIBRATION V3 (STAGE C TOPOLOGY)")
    print("="*60)

    # 1. Run a test point at midpoint to verify functionality and sensitivity
    # (Because method='bounded' rejects the x0 argument natively)
    print("Running initial sanity check at ke = 775 N/mm...")
    t0 = time.time()
    rmse_test = solve_for_ke(775.0)

    # 2. Optimization Loop
    print("\nStarting Scipy Optimization (Bounded 50-1500)...")
    res = minimize_scalar(
        solve_for_ke,
        bounds=(50, 1500),
        method='bounded',
        options={'xatol': 1.0}
    )

    opt_ke = res.x
    opt_rmse = res.fun

    print("="*60)
    print(f" OPTIMIZATION COMPLETE in {time.time()-t0:.1f}s")
    print(f" Optimal ke = {opt_ke:.2f} N/mm")
    print(f" Minimum RMSE = {opt_rmse:.4f} mm")
    print("="*60)

    # 3. Final Validation & Extraction
    print("\nRunning final validation and image generation...")
    final_rmse, val_table = solve_for_ke(opt_ke, is_validation=True)

    # 4. Save Results
    res_str = ""
    res_str += "GS CALIBRATION RESULT V3\n"

```

```

res_str += f"ke_calibrated = {opt_ke:.2f} N/mm\n"
res_str += f"RMSE (TOP)    = {final_rmse:.4f} mm\n"
res_str += f"N points      = {len(gs)}\n"
res_str += f"EX (fixed)      = 9.3 GPa (Guadua)\n"
res_str += f"Iterations      = {res.nfev}\n"
res_str += "=====\n\n"
res_str += val_table

print("\n" + res_str)

with open(OUT_FILE, 'w') as f:
    f.write(res_str)

print(f"\nResults saved to: {OUT_FILE}")
print(f"Deformation plot saved to: Active_Simulation/GS/calibration/GS_v3_DeformedShape.png")

mapdl.exit()

```

A.1.5 pymapdl_macro_connections_v6.py

```

"""
PyMAPDL Winkler Spring Bed Connection Architecture - V6
-----
V6: Fully Linear Equivalent model (Secant Stiffness approach) with diagonal subdivisions.
All non-linearities purged. Exclusively COMBIN14 linear springs.
"""

import numpy as np

def build_simplified_gshs_model(mapdl, ks_modulus, trial_k_bond):
    """
    Builds the complete GSHS Winkler Spring Bed model inside /PREP7 + /SOLU.
    Applies all boundary conditions internally. Returns node references needed
    by the calibration script.

    Parameters
    -----
    mapdl      : PyMAPDL instance
    ks_modulus  : float   Winkler subgrade modulus [N/m^3]
    trial_k_bond : float   Secant Bond Stiffness [N/m/m]

    Returns
    -----
    post_grid   : dict    {level: {xi: node_id}}
    top_solera   : list    [node_id, node_id, node_id]
    NL           : int     Number of Levels (22)
    """
    W, H, S     = 2.20, 2.20, 0.10
    L            = W / 2.0
    NL           = int(round(H / S))          # 22
    XP           = [0.0, L, W]
    D_col        = 0.10                     # Guadua outer diameter [m]

```

```

Y_offset = 1e-5                                # Base offset
ke_N_per_m = 259.02e3                          # Lata slip stiffness [N/m] from GHS clos
ure

# -----
# /PREP7
# -----
mapdl.run("/PREP7")

# Materials
mapdl.mp('EX', 1, 5.0e9); mapdl.mp('PRXY', 1, 0.20); mapdl.mp('DENS', 1, 600.0)
mapdl.mp('EX', 2, 9.3e9); mapdl.mp('PRXY', 2, 0.35); mapdl.mp('DENS', 2, 508.3)
mapdl.mp('EX', 3, 9.3e9); mapdl.mp('PRXY', 3, 0.35); mapdl.mp('DENS', 3, 508.3)

# Sections
mapdl.sectype(1, 'BEAM', 'CTUBE', 'GuaduaFrame'); mapdl.secddata(0.04, 0.05)
mapdl.sectype(2, 'BEAM', 'RECT', 'WoodSolera'); mapdl.secddata(0.10, 0.05)
mapdl.sectype(3, 'BEAM', 'RECT', 'LataFront'); mapdl.secddata(0.015, 0.05); map
dl.secoffset('USER', 0.0575, 0)
mapdl.sectype(4, 'BEAM', 'RECT', 'LataBack'); mapdl.secddata(0.015, 0.05); map
dl.secoffset('USER', -0.0575, 0)

# -----
# ELEMENT FORMULATION & REAL CONSTANTS
# -----
mapdl.et(1, 'BEAM188')
mapdl.et(2, 'COMBIN14', kop2=1) # Lata slip (UX)
mapdl.et(3, 'COMBIN14', kop2=1) # Winkler Soil (UX)
mapdl.et(4, 'COMBIN14', kop2=3) # Axial Bond (UZ)

# REAL 1: Lata slip
mapdl.r(1, ke_N_per_m)

# REAL 2: Winkler soil (flat tributary area consistency)
k_winkler = ks_modulus * S * D_col
mapdl.r(2, k_winkler)

# REAL 5: Axial Bond (Secant Stiffness)
k_axial_bond = trial_k_bond * S * D_col
mapdl.r(5, k_axial_bond)

# -----
# NODE GENERATION
# -----
post_grid = {}
for lv in range(NL + 1):
    z = round(lv * S, 6)
    post_grid[lv] = {}
    for xi, xv in enumerate(XP):
        post_grid[lv][xi] = mapdl.n(None, xv, Y_offset, z)

lata_grid = {}
for lv in range(1, NL):
    z = round(lv * S, 6)
    lata_grid[lv] = {}

```

```

    for xi, xv in enumerate(XP):
        lata_grid[lv][xi] = mapdl.n(None, xv, Y_offset, z)

top_solera = [
    mapdl.n(None, 0.0, Y_offset, H),
    mapdl.n(None, L, Y_offset, H),
    mapdl.n(None, W, Y_offset, H),
]
diag_L_top = mapdl.n(None, 0.0, Y_offset, H)
diag_L_bot = mapdl.n(None, L, Y_offset, 0.0)
diag_R_top = mapdl.n(None, W, Y_offset, H)
diag_R_bot = mapdl.n(None, L, Y_offset, 0.0)

# -----
# BEAM ELEMENTS
# -----
mapdl.type(1); mapdl.mat(2); mapdl.secnum(1)
for xi in range(3):
    for lv in range(NL):
        mapdl.e(post_grid[lv][xi], post_grid[lv + 1][xi])

# Left Diagonal Interpolation
dx_L, dz_L = L - 0.0, 0.0 - H
n_DL_13 = mapdl.n(None, 0.0 + dx_L/3.0, Y_offset, H + dz_L/3.0)
n_DL_23 = mapdl.n(None, 0.0 + 2*dx_L/3.0, Y_offset, H + 2*dz_L/3.0)

# Left Diagonal Element Creation
mapdl.e(diag_L_top, n_DL_13)           # Top third
mapdl.e(n_DL_13, n_DL_23)           # Middle third
mapdl.e(n_DL_23, diag_L_bot)         # Bottom third
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-2', 'EM')
mapdl.run("CM, D_L, ELEM")
mapdl.esel('S', 'ELEM', '', 'EM')
mapdl.run("CM, D_L_BOT, ELEM")

# Right Diagonal Interpolation
dx_R, dz_R = L - W, 0.0 - H
n_DR_13 = mapdl.n(None, W + dx_R/3.0, Y_offset, H + dz_R/3.0)
n_DR_23 = mapdl.n(None, W + 2*dx_R/3.0, Y_offset, H + 2*dz_R/3.0)

# Right Diagonal Element Creation
mapdl.e(diag_R_top, n_DR_13)           # Top third
mapdl.e(n_DR_13, n_DR_23)           # Middle third
mapdl.e(n_DR_23, diag_R_bot)         # Bottom third
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-2', 'EM')
mapdl.run("CM, D_R, ELEM")
mapdl.esel('S', 'ELEM', '', 'EM')
mapdl.run("CM, D_R_BOT, ELEM")

mapdl.mat(1); mapdl.secnum(2)
mapdl.e(post_grid[0][0], post_grid[0][1])
mapdl.e(post_grid[0][1], post_grid[0][2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")

```

```

mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM'); mapdl.run("CM, S_BASE, ELEM")

mapdl.e(top_solera[0], top_solera[1])
mapdl.e(top_solera[1], top_solera[2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM'); mapdl.run("CM, S_TOP, ELEM")

mapdl.type(1); mapdl.mat(3)
for lv in range(1, NL):
    for sec in [3, 4]:
        mapdl.secnum(sec)
        mapdl.e(lata_grid[lv][0], lata_grid[lv][1])
        mapdl.e(lata_grid[lv][1], lata_grid[lv][2])

# -----
# CP COUPLING + COMBIN14 LATA SLIP SPRINGS
# -----
cp_num = 1
def bind_nodes(nodes_list, dofs):
    nonlocal cp_num
    for dof in dofs:
        if len(nodes_list) == 2:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1])
        elif len(nodes_list) == 3:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1], nodes_list[2])
        cp_num += 1

for lv in range(1, NL):
    for xi in range(3):
        bind_nodes([post_grid[lv][xi], lata_grid[lv][xi]], dofs=['UY', 'UZ', 'ROT
X'])

mapdl.type(2); mapdl.real(1)
for lv in range(1, NL):
    for xi in range(3):
        mapdl.e(post_grid[lv][xi], lata_grid[lv][xi])

# UX is intentionally excluded from CP dofs – it is handled by the
# 7 COMBIN14 joint springs below (exact parity with GHS v6 topology).
_joint_dofs = ['UY', 'UZ', 'ROTX', 'ROTY', 'ROTZ']

# Joint 0: Top Left (Solera + Post + Diagonal)
bind_nodes([top_solera[0], post_grid[NL][0], diag_L_top], dofs=_joint_dofs)
mapdl.type(2); mapdl.real(1)
mapdl.e(top_solera[0], post_grid[NL][0])
mapdl.e(top_solera[0], diag_L_top)

# Joint 1: Top Center (Solera + Post)
bind_nodes([top_solera[1], post_grid[NL][1]], dofs=_joint_dofs)
mapdl.type(2); mapdl.real(1)
mapdl.e(top_solera[1], post_grid[NL][1])

# Joint 2: Top Right (Solera + Post + Diagonal)
bind_nodes([top_solera[2], post_grid[NL][2], diag_R_top], dofs=_joint_dofs)
mapdl.type(2); mapdl.real(1)

```

```

mapdl.e(top_solera[2], post_grid[NL][2])
mapdl.e(top_solera[2], diag_R_top)

# Joint 3: Bottom Center (Post + Left Diag + Right Diag)
bind_nodes([post_grid[0][1], diag_L_bot, diag_R_bot], dofs=_joint_dofs)
mapdl.type(2); mapdl.real(1)
mapdl.e(post_grid[0][1], diag_L_bot)
mapdl.e(post_grid[0][1], diag_R_bot)

mapdl.allsel()

# BEAM_NODES component
mapdl.esel('S', 'TYPE', '', 1)
mapdl.nsle('S')
mapdl.cm('BEAM_NODES', 'NODE')
mapdl.allsel()

# -----
# ANCHOR NODES + WINKLER SPRING BED + AXIAL BOND
# -----
anchor_node_ids = []
for lv in range(NL + 1):
    z = round(lv * S, 6)
    for xi, xv in enumerate(XP):
        # Microscopic offset (Y = Y_offset + 1e-4) to ensure L > 0
        an = mapdl.n(None, xv, Y_offset + 1e-4, z)
        anchor_node_ids.append(an)

    col_node = post_grid[lv][xi]

    # COMBIN14 UX Winkler Lateral spring
    mapdl.type(3); mapdl.real(2)
    mapdl.e(col_node, an)

    # COMBIN14 UZ Axial bond spring
    mapdl.type(4); mapdl.real(5)
    mapdl.e(col_node, an)

mapdl.nsel('S', 'NODE', '', anchor_node_ids[0])
for aid in anchor_node_ids[1:]:
    mapdl.nsel('A', 'NODE', '', aid)
mapdl.cm('ANCHOR_NODES', 'NODE')
mapdl.allsel()

# -----
# BOUNDARY CONDITIONS
# -----
mapdl.run("/SOLU")
mapdl.antype('STATIC')
mapdl.nlgeom('OFF')

# 1. Anchor nodes: targeted fixity matching each spring's active KEYOPT(2) DOF.
# TYPE 3 (kop2=1 → UX Winkler Lateral): fix UX only.
# TYPE 4 (kop2=3 → UZ axial bond): fix UZ only.
# UY and ROTZ are NOT applied – physically meaningless on 1D spring anchors

```

```

# and were the primary source of the diagnosed over-stiffness.
mapdl.cmsel('S', 'ANCHOR_NODES')
mapdl.d('ALL', 'UX', 0.0)
mapdl.d('ALL', 'UZ', 0.0)

# 2. Rigid Foundation at Base Z=0 (GHS alignment - S_BASE component only).
mapdl.cmsel('S', 'S_BASE')
mapdl.nsle('S')
mapdl.d('ALL', 'ALL', 0.0)
mapdl.allsel()

mapdl.finish()

return post_grid, top_solera, NL

```

A.2.1 lhs_solver_GHS.py

```

import os
import numpy as np
import pandas as pd
from scipy.stats import truncnorm
from ansys.mapdl.core import launch_mapdl

def build_ghs_model(mapdl, opt_ke):
    """
    Builds the GHS frame + Lata model and initializes CMs.
    Extracts geometric and element logic from calibration_GHS_v7.py.
    """
    W, H, S = 2.20, 2.20, 0.10
    L = W / 2.0
    NL = int(round(H / S))
    XP = [0.0, L, W]

    mapdl.clear()
    mapdl.run("/PREP7")

    # Materials
    mapdl.mp('EX', 1, 5.0e9)
    mapdl.mp('PRXY', 1, 0.20)
    mapdl.mp('DENS', 1, 600.0)
    mapdl.mp('EX', 2, 9.3e9)
    mapdl.mp('PRXY', 2, 0.35)
    mapdl.mp('DENS', 2, 508.3)
    mapdl.mp('EX', 3, 9.3e9)
    mapdl.mp('PRXY', 3, 0.35)
    mapdl.mp('DENS', 3, 508.3)

    # Sections
    mapdl.sectype(1, 'BEAM', 'CTUBE', 'GuaduaFrame')
    mapdl.secddata(0.04, 0.05)
    mapdl.sectype(2, 'BEAM', 'RECT', 'WoodSoleras')
    mapdl.secddata(0.10, 0.05)
    mapdl.sectype(3, 'BEAM', 'RECT', 'LataFront')
    mapdl.secddata(0.015, 0.05)

```

```

mapdl.secoffset('USER', 0.0575, 0)
mapdl.sectype(4, 'BEAM', 'RECT', 'LataBack')
mapdl.secddata(0.015, 0.05)
mapdl.secoffset('USER', -0.0575, 0)

# Element types
mapdl.et(1, 'BEAM188')
mapdl.et(2, 'COMBIN14', kop2=1)

# Real constant for COMBIN14 (ke)
ke_N_m = opt_ke * 1000.0
mapdl.r(1, ke_N_m)

# Nodes - Post Grid
post_grid = {}
for lv in range(NL + 1):
    z = round(lv * S, 6)
    post_grid[lv] = {}
    for xi, xv in enumerate(XP):
        post_grid[lv][xi] = mapdl.n(None, xv, 0.0, z)

# Nodes - Lata Grid
lata_grid = {}
for lv in range(1, NL):
    z = round(lv * S, 6)
    lata_grid[lv] = {}
    for xi, xv in enumerate(XP):
        lata_grid[lv][xi] = mapdl.n(None, xv, 0.0, z)

# Nodes - Top Solera & Diagonals
top_solera = [mapdl.n(None, 0.0, 0.0, H),
               mapdl.n(None, L, 0.0, H),
               mapdl.n(None, W, 0.0, H)]

diag_L_top = mapdl.n(None, 0.0, 0.0, H)
diag_L_bot = mapdl.n(None, L, 0.0, 0.0)
diag_R_top = mapdl.n(None, W, 0.0, H)
diag_R_bot = mapdl.n(None, L, 0.0, 0.0)

# Elements - Posts with CMs
mapdl.type(1)
mapdl.mat(2)
mapdl.secnum(1)
for xi in range(3):
    for lv in range(NL):
        mapdl.e(post_grid[lv][xi], post_grid[lv+1][xi])
        mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
        mapdl.esel('S', 'ELEM', '', 'E_MAX')
        mapdl.run(f"CM, G_C{xi}_L{lv}, ELEM")

# Elements - Diagonals (Subdivided into 3 elements each)
mapdl.type(1)
mapdl.mat(2)
mapdl.secnum(1)

```

```

# Left Diagonal Interpolation
dx_L, dz_L = L - 0.0, 0.0 - H
n_DL_13 = mapdl.n(None, 0.0 + dx_L/3.0, 0.0, H + dz_L/3.0)
n_DL_23 = mapdl.n(None, 0.0 + 2*dx_L/3.0, 0.0, H + 2*dz_L/3.0)

# Left Diagonal Element Creation
mapdl.e(diag_L_top, n_DL_13)           # Top third
mapdl.e(n_DL_13, n_DL_23)             # Middle third
mapdl.e(n_DL_23, diag_L_bot)          # Bottom third
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-2', 'EM')
mapdl.run("CM, D_L, ELEM")
mapdl.esel('S', 'ELEM', '', 'EM')
mapdl.run("CM, D_L_BOT, ELEM")

# Right Diagonal Interpolation
dx_R, dz_R = L - W, 0.0 - H
n_DR_13 = mapdl.n(None, W + dx_R/3.0, 0.0, H + dz_R/3.0)
n_DR_23 = mapdl.n(None, W + 2*dx_R/3.0, 0.0, H + 2*dz_R/3.0)

# Right Diagonal Element Creation
mapdl.e(diag_R_top, n_DR_13)           # Top third
mapdl.e(n_DR_13, n_DR_23)             # Middle third
mapdl.e(n_DR_23, diag_R_bot)          # Bottom third
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-2', 'EM')
mapdl.run("CM, D_R, ELEM")
mapdl.esel('S', 'ELEM', '', 'EM')
mapdl.run("CM, D_R_BOT, ELEM")

# Elements - Base solera
mapdl.mat(1)
mapdl.secnum(2)
mapdl.e(post_grid[0][0], post_grid[0][1])
mapdl.e(post_grid[0][1], post_grid[0][2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
mapdl.run("CM, S_BASE, ELEM")

# Elements - Top solera
mapdl.e(top_solera[0], top_solera[1])
mapdl.e(top_solera[1], top_solera[2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
mapdl.run("CM, S_TOP, ELEM")

# Elements - Latas with CMs (Group Sampling requirement)
mapdl.type(1)
mapdl.mat(3)
for lv in range(1, NL):
    # Front Lata
    mapdl.secnum(3)
    mapdl.e(lata_grid[lv][0], lata_grid[lv][1])
    mapdl.e(lata_grid[lv][1], lata_grid[lv][2])
    mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")

```

```

mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
mapdl.run(f"CM, L_F_{lv}, ELEM")

# Back Latas
mapdl.secnum(4)
mapdl.e(lata_grid[lv][0], lata_grid[lv][1])
mapdl.e(lata_grid[lv][1], lata_grid[lv][2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
mapdl.run(f"CM, L_B_{lv}, ELEM")

# CP constraints & COMBIN14 springs
cp_num = 1

def bind_nodes(nodes_list, dofs=None):
    nonlocal cp_num
    if dofs is None:
        dofs = ['UY', 'UZ', 'ROTX', 'ROTY', 'ROTZ']
    for dof in dofs:
        if len(nodes_list) == 2:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1])
        elif len(nodes_list) == 3:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1], nodes_list[2])
        cp_num += 1

# Lata CPs
for lv in range(1, NL):
    for xi in range(3):
        pn = post_grid[lv][xi]
        ln = lata_grid[lv][xi]
        bind_nodes([pn, ln], dofs=['UY', 'UZ', 'ROTX'])

# Lata Springs
mapdl.type(2)
mapdl.real(1)
for lv in range(1, NL):
    for xi in range(3):
        mapdl.e(post_grid[lv][xi], lata_grid[lv][xi])

# Frame Connections (Joint topology)
# Joint 0: Top Left (Solera, Post, Diagonal)
bind_nodes([top_solera[0], post_grid[NL][0], diag_L_top])
mapdl.e(top_solera[0], post_grid[NL][0])
mapdl.e(top_solera[0], diag_L_top)

# Joint 1: Top Center (Solera, Post)
bind_nodes([top_solera[1], post_grid[NL][1]])
mapdl.e(top_solera[1], post_grid[NL][1])

# Joint 2: Top Right (Solera, Post, Diagonal)
bind_nodes([top_solera[2], post_grid[NL][2], diag_R_top])
mapdl.e(top_solera[2], post_grid[NL][2])
mapdl.e(top_solera[2], diag_R_top)

# Joint 3: Bottom Center (Rigid Base, Left Diag, Right Diag)

```

```

bind_nodes([post_grid[0][1], diag_L_bot, diag_R_bot])
mapdl.e(post_grid[0][1], diag_L_bot)
mapdl.e(post_grid[0][1], diag_R_bot)

# Initial Boundary Conditions
mapdl.slashsolu()
mapdl.cmsel('S', 'S_BASE')
mapdl.nsle('S')
mapdl.d('ALL', 'ALL')
mapdl.allsel()

return top_solera, post_grid

def run_stochastic_scenario(target_scenario, n_iterations):
    # Output Routing
    run_dir = os.path.join(os.getcwd(), 'Active_Simulation', 'Stochastic_LHS', 'GHS',
f'Scenario_{target_scenario}')
    os.makedirs(run_dir, exist_ok=True)

    mapdl = launch_mapdl(run_location=run_dir, override=True, jobname="lhs_GHS", logl
evel="ERROR")

    # GHS Baseline Constants
    opt_ke = 259.02
    V_load = 2.6748

    # Build Model and extract references
    top_solera_nodes, post_grid = build_ghs_model(mapdl, opt_ke)
    sensor_nodes = [post_grid[21][xi] for xi in range(3)] # Calibration sensor: post
_grid level 21, Z=2.10m

    # Memory Sanitation: Save pristine baseline
    mapdl.finish()
    mapdl.save("pristine_baseline.db")

    # LHS parameters
    mu = 8404.44
    sigma = 3075.02
    EX_base = 9300.0
    a_bound = (0 - mu) / sigma
    b_bound = (EX_base - mu) / sigma

    # Hazard Zone Mapping (Explicit Arrays)
    zones = {
        'A': {
            'cms': ['G_C0_L0', 'G_C1_L0', 'G_C2_L0', 'G_C0_L21', 'G_C1_L21', 'G_C2_L2
1'],
            'bounds': (0.45, 0.70)
        },
        'B': {
            'cms': [
                'G_C0_L0', 'G_C0_L1', 'G_C0_L2', 'G_C0_L3', 'G_C0_L4',
                'G_C1_L0', 'G_C1_L1', 'G_C1_L2', 'G_C1_L3', 'G_C1_L4',
                'G_C2_L0', 'G_C2_L1', 'G_C2_L2', 'G_C2_L3', 'G_C2_L4'
            ],

```

```

        'bounds': (0.35, 0.60)
    },
    'C': {
        'cms': ['D_L_BOT', 'D_R_BOT'],
        'bounds': (0.20, 0.40)
    },
    'D': {
        'cms': ['L_F_1', 'L_F_2', 'L_F_3', 'L_F_4', 'L_F_5',
                'L_B_1', 'L_B_2', 'L_B_3', 'L_B_4', 'L_B_5'],
        'bounds': (0.15, 0.35)
    }
}

trace_log = []
drift_log = []
id_counter = 100

for i in range(1, n_iterations + 1):
    # Memory Sanitation & Processor Context
    mapdl.finish()
    mapdl.resume("pristine_baseline.db")
    mapdl.prep7()

    target_cms = []
    target_zones = ['A', 'B', 'C', 'D'] if target_scenario == 'E' else [target_sc
enario]

    # Calculate discrete sample sizes
    for z_key in target_zones:
        if z_key not in zones:
            continue
        z_data = zones[z_key]
        n_elem = len(z_data['cms'])
        m_min = int(n_elem * z_data['bounds'][0])
        m_max = int(n_elem * z_data['bounds'][1])

        m_max = max(1, m_max)
        if m_max >= m_min:
            m = np.random.randint(m_min, m_max + 1)
        else:
            m = m_min

        if m > 0:
            m = min(m, n_elem)
            selected = np.random.choice(z_data['cms'], size=m, replace=False)
            target_cms.extend(selected)

    # EMODIF Implementation
    for cm in target_cms:
        EX_rand = truncnorm.rvs(a_bound, b_bound, loc=mu, scale=sigma)
        D = EX_rand / EX_base
        ke_rand = opt_ke * D

        id_counter += 1

```

```

        # Modify EX on BEAM188
        # Group Sampling Explicit Rule: applies the calculated degradation to all
        elements within the selected CM simultaneously.
        mapdl.cmsel('S', cm)
        mapdl.mp('EX', id_counter, EX_rand * 1e6)
        # Corrected PRXY parity: Both Guadua and Latas use PRXY=0.35 in calibrati
on
        mapdl.mp('PRXY', id_counter, 0.35)
        mapdl.emodif('ALL', 'MAT', id_counter)

        # Modify ke on attached COMBIN14 (GHS Override: strictly filter and modif
y ONLY ke real constants)
        mapdl.nsle()
        mapdl.esln('S', 0)
        mapdl.esel('R', 'TYPE', '', 2)
        mapdl.esel('R', 'REAL', '', 1)

        mapdl.run("*GET, E_COUNT, ELEM, 0, COUNT")
        if mapdl.parameters['E_COUNT'] > 0:
            mapdl.r(id_counter, ke_rand * 1000.0)
            mapdl.emodif('ALL', 'REAL', id_counter)

        # Log traceability
        trace_log.append({
            'Iteration_ID': i,
            'Hazard_Zone': target_scenario,
            'Component_ID': cm,
            'Applied_EX_MPa': EX_rand,
            'Applied_ke_N_mm': ke_rand,
            'Damage_Factor_D': D,
            'Dynamic_MAT_ID': id_counter,
            'Dynamic_REAL_ID': id_counter
        })

    # Boundary Condition Re-Initialization & Solver Handling
    mapdl.allsel()
    mapdl.slashsolu()
    mapdl.antype('STATIC')
    mapdl.nlgeom('OFF')

    # Verify and re-apply target static lateral force
    mapdl.fdele('ALL', 'ALL')
    for n in top_solera_nodes:
        mapdl.f(n, 'FX', (V_load * 1000.0) / 3.0)

    try:
        mapdl.solve()
        mapdl.run("/POST1")
        ux_vals = []
        for n in sensor_nodes:
            ux = mapdl.get_value('NODE', n, 'U', 'X')
            ux_vals.append(ux)
        Delta_TOP = float(np.mean(ux_vals)) * 1000.0
        collapse = False
    except Exception as e:

```

```

print(f"\n>>> SOLVER CRASH / EXCEPTION: {e} <<<\n")
Delta_TOP = 9999.0
collapse = True
try:
    mapdl.exit()
except Exception:
    pass

drift_log.append({
    'Iteration_ID': i,
    'Scenario_ID': target_scenario,
    'Delta_TOP_mm': Delta_TOP,
    'Solver_Collapse_Flag': collapse
})

# Output Routing
df_trace = pd.DataFrame(trace_log)
df_drift = pd.DataFrame(drift_log)

trace_path = os.path.join(run_dir, 'stochastic_traceability_log.csv')
drift_path = os.path.join(run_dir, 'stochastic_drift_results.csv')

# Append mode
df_trace.to_csv(trace_path, mode='a', index=False, header=not os.path.exists(trace_path))
df_drift.to_csv(drift_path, mode='a', index=False, header=not os.path.exists(drift_path))

mapdl.exit()
print(f"Scenario {target_scenario} completed. N = {n_iterations}.")

if __name__ == '__main__':
    # Production Execution (Task 3.3)
    for esc in ['A', 'B', 'C', 'D', 'E']:
        run_stochastic_scenario(esc, n_iterations=100)

```

A.2.2 lhs_solver_GS.py

```

import os
import numpy as np
import pandas as pd
from scipy.stats import truncnorm
from ansys.mapdl.core import launch_mapdl

def build_gs_model(mapdl, opt_ke):
    """
    Builds the GS bare frame model and initializes CMs.
    Extracts geometric and element logic from calibration_GS_v3.py
    and component manager strings from bahareque_base_model.py.
    """
    mapdl.clear()
    mapdl.prep7()

    W_wall, H_wall, S_lata = 2.20, 2.20, 0.10

```

```

L_panel = W_wall / 2.0
NL = int(H_wall / S_lata)

mapdl.mp('EX', 1, 5.0e9)
mapdl.mp('PRXY', 1, 0.20)
mapdl.mp('DENS', 1, 600)
mapdl.mp('EX', 2, 9.3e9)
mapdl.mp('PRXY', 2, 0.35)
mapdl.mp('DENS', 2, 508.3)

mapdl.sectype(1, 'BEAM', 'CTUBE', 'GuaduaFrame')
mapdl.secddata(0.04, 0.05)
mapdl.sectype(2, 'BEAM', 'RECT', 'WoodSoleras')
mapdl.secddata(0.10, 0.05)

mapdl.et(1, 'BEAM188')
mapdl.et(2, 'COMBIN14', kop2=1)

ke_N_m = opt_ke * 1000.0
mapdl.real(1)
mapdl.r(1, ke_N_m)

node_grid = {}
for level in range(NL + 1):
    z = round(level * S_lata, 6)
    node_grid[level] = {}
    for xi, xv in enumerate([0.0, L_panel, W_wall]):
        node_grid[level][xi] = mapdl.n(None, xv, 0.0, z)

top_solera = [mapdl.n(None, 0.0, 0.0, H_wall),
               mapdl.n(None, L_panel, 0.0, H_wall),
               mapdl.n(None, W_wall, 0.0, H_wall)]

diag_L_top = mapdl.n(None, 0.0, 0.0, H_wall)
diag_L_bot = mapdl.n(None, L_panel, 0.0, 0.0)
diag_R_top = mapdl.n(None, W_wall, 0.0, H_wall)
diag_R_bot = mapdl.n(None, L_panel, 0.0, 0.0)

mapdl.type(1)
mapdl.mat(2)
mapdl.secnum(1)
for xi in range(3):
    for level in range(NL):
        mapdl.e(node_grid[level][xi], node_grid[level + 1][xi])
        mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
        mapdl.esel('S', 'ELEM', '', 'E_MAX')
        mapdl.run(f"CM, G_C{xi}_L{level}, ELEM")

mapdl.mat(1)
mapdl.secnum(2)
mapdl.e(node_grid[0][0], node_grid[0][1])
mapdl.e(node_grid[0][1], node_grid[0][2])
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-1', 'E_MAX')
mapdl.run("CM, S_BASE, ELEM")

```

```

mapdl.e(top_solera[0], top_solera[1])
mapdl.e(top_solera[1], top_solera[2])
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-1', 'E_MAX')
mapdl.run("CM, S_TOP, ELEM")

mapdl.type(1)
mapdl.mat(2)
mapdl.secnum(1)

# Left Diagonal Interpolation
dx_L, dz_L = L_panel - 0.0, 0.0 - H_wall
n_DL_13 = mapdl.n(None, 0.0 + dx_L/3.0, 0.0, H_wall + dz_L/3.0)
n_DL_23 = mapdl.n(None, 0.0 + 2*dx_L/3.0, 0.0, H_wall + 2*dz_L/3.0)

# Left Diagonal Element Creation
mapdl.e(diag_L_top, n_DL_13)           # Top third
mapdl.e(n_DL_13, n_DL_23)             # Middle third
mapdl.e(n_DL_23, diag_L_bot)          # Bottom third
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-2', 'E_MAX')
mapdl.run("CM, D_L, ELEM")
mapdl.esel('S', 'ELEM', '', 'E_MAX')
mapdl.run("CM, D_L_BOT, ELEM")

# Right Diagonal Interpolation
dx_R, dz_R = L_panel - W_wall, 0.0 - H_wall
n_DR_13 = mapdl.n(None, W_wall + dx_R/3.0, 0.0, H_wall + dz_R/3.0)
n_DR_23 = mapdl.n(None, W_wall + 2*dx_R/3.0, 0.0, H_wall + 2*dz_R/3.0)

# Right Diagonal Element Creation
mapdl.e(diag_R_top, n_DR_13)           # Top third
mapdl.e(n_DR_13, n_DR_23)             # Middle third
mapdl.e(n_DR_23, diag_R_bot)          # Bottom third
mapdl.run("*GET, E_MAX, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'E_MAX-2', 'E_MAX')
mapdl.run("CM, D_R, ELEM")
mapdl.esel('S', 'ELEM', '', 'E_MAX')
mapdl.run("CM, D_R_BOT, ELEM")

mapdl.allsel()

mapdl.type(2)
mapdl.real(1)
cp_num = 1

def bind_nodes(nodes_list):
    nonlocal cp_num
    for dof in ['UY', 'UZ', 'ROTX', 'ROTY', 'ROTZ']:
        if len(nodes_list) == 2:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1])
        elif len(nodes_list) == 3:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1], nodes_list[2])
        cp_num += 1

```

```

bind_nodes([top_solera[0], node_grid[NL][0], diag_L_top])
mapdl.e(top_solera[0], node_grid[NL][0])
mapdl.e(top_solera[0], diag_L_top)

bind_nodes([top_solera[1], node_grid[NL][1]])
mapdl.e(top_solera[1], node_grid[NL][1])

bind_nodes([top_solera[2], node_grid[NL][2], diag_R_top])
mapdl.e(top_solera[2], node_grid[NL][2])
mapdl.e(top_solera[2], diag_R_top)

bind_nodes([node_grid[0][1], diag_L_bot, diag_R_bot])
mapdl.e(node_grid[0][1], diag_L_bot)
mapdl.e(node_grid[0][1], diag_R_bot)

mapdl.slashsolu()
mapdl.cmsel('S', 'S_BASE')
mapdl.nsle('S')
mapdl.d('ALL', 'ALL')
mapdl.allsel()

return top_solera, node_grid

def run_stochastic_scenario(target_scenario, n_iterations):
    # 9. Output Routing & Isolated Working Directory
    run_dir = os.path.join(os.getcwd(), 'Active_Simulation', 'Stochastic_LHS', 'GS',
f'Scenario_{target_scenario}')
    os.makedirs(run_dir, exist_ok=True)

    mapdl = launch_mapdl(run_location=run_dir, override=True, jobname="lhs_GS", logle
vel="ERROR")

    # 3. GS Baseline Constants
    opt_ke = 260.89
    V_load = 0.33850844

    # Build Model and extract references
    top_solera_nodes, node_grid = build_gs_model(mapdl, opt_ke)
    sensor_nodes = [node_grid[21][xi] for xi in range(3)] # Calibration sensor: node
_grid Level 21, Z=2.10m

    # 6. Memory Sanitation: Save pristine baseline
    mapdl.finish()
    mapdl.save("pristine_baseline.db")

    # LHS parameters
    mu = 8404.44
    sigma = 3075.02
    EX_base = 9300.0
    a_bound = (0 - mu) / sigma
    b_bound = (EX_base - mu) / sigma

    # Component Zone Mapping (Explicit extraction from bahareque_base_model.py)

```

```

zones = {
    'A': {
        'cms': ['G_C0_L0', 'G_C1_L0', 'G_C2_L0', 'G_C0_L21', 'G_C1_L21', 'G_C2_L2
1'], # Zone 1: V-shaped column-diagonal joints
        'bounds': (0.45, 0.70)
    },
    'B': {
        'cms': [
            'G_C0_L0', 'G_C0_L1', 'G_C0_L2', 'G_C0_L3', 'G_C0_L4',
            'G_C1_L0', 'G_C1_L1', 'G_C1_L2', 'G_C1_L3', 'G_C1_L4',
            'G_C2_L0', 'G_C2_L1', 'G_C2_L2', 'G_C2_L3', 'G_C2_L4'
        ], # Zone 2: Vertical parales  $Z \leq 0.50m$ 
        'bounds': (0.35, 0.60)
    },
    'C': {
        'cms': ['D_L_BOT', 'D_R_BOT'], # Zone 3: Diagonals (Lower one-third expli
citly bounded by components)
        'bounds': (0.20, 0.40)
    }
}

trace_log = []
drift_log = []
id_counter = 100

for i in range(1, n_iterations + 1):
    # 6. Memory Sanitation & Processor Context (with MAPDL resurrection guard)
    try:
        mapdl.resume("pristine_baseline.db")
        mapdl.prep7()
    except Exception:
        # MAPDL process was killed by a previous solver crash – resurrect it.
        try:
            mapdl.exit()
        except Exception:
            pass
        mapdl = launch_mapdl(run_location=run_dir, override=True, jobname="lhs_GS
", loglevel="ERROR")
        top_solera_nodes, node_grid = build_gs_model(mapdl, opt_ke)
        sensor_nodes = [node_grid[21][xi] for xi in range(3)]
        mapdl.finish()
        mapdl.save("pristine_baseline.db")
        mapdl.finish()
        mapdl.prep7()

    target_cms = []
    target_zones = ['A', 'B', 'C'] if target_scenario == 'E' else [target_scenari
o]

    # 7. Calculate discrete sample sizes
    for z_key in target_zones:
        if z_key not in zones:
            continue
        z_data = zones[z_key]
        n_elem = len(z_data['cms'])

```

```

m_min = int(n_elem * z_data['bounds'][0])
m_max = int(n_elem * z_data['bounds'][1])

m_max = max(1, m_max) # Ensure at least 1 element can be degraded if zone
is active

if m_max >= m_min:
    m = np.random.randint(m_min, m_max + 1)
else:
    m = m_min

if m > 0:
    m = min(m, n_elem)
    selected = np.random.choice(z_data['cms'], size=m, replace=False)
    target_cms.extend(selected)

# 7. EMODIF Implementation
for cm in target_cms:
    EX_rand = truncnorm.rvs(a_bound, b_bound, loc=mu, scale=sigma)
    D = EX_rand / EX_base
    ke_rand = opt_ke * D

    id_counter += 1

    # Modify EX on BEAM188
    mapdl.cmsel('S', cm)
    mapdl.mp('EX', id_counter, EX_rand * 1e6)
    mapdl.mp('PRXY', id_counter, 0.35)
    mapdl.emodif('ALL', 'MAT', id_counter)

    # Modify ke on attached COMBIN14 (GS Override: restrict exclusively to ke
)

    mapdl.nsle()
    mapdl.esln('S', 0)
    mapdl.esel('R', 'TYPE', '', 2)
    mapdl.esel('R', 'REAL', '', 1)

    mapdl.run("*GET, E_COUNT, ELEM, 0, COUNT")
    if mapdl.parameters['E_COUNT'] > 0:
        mapdl.r(id_counter, ke_rand * 1000.0)
        mapdl.emodif('ALL', 'REAL', id_counter)

    # Log traceability
    trace_log.append({
        'Iteration_ID': i,
        'Hazard_Zone': target_scenario,
        'Component_ID': cm,
        'Applied_EX_MPa': EX_rand,
        'Applied_ke_N_mm': ke_rand,
        'Damage_Factor_D': D,
        'Dynamic_MAT_ID': id_counter,
        'Dynamic_REAL_ID': id_counter
    })

# 8. Boundary Condition Re-Initialization & Solver Handling
mapdl.allsel()

```

```

mapdl.slashsolu()
mapdl.antype('STATIC')
mapdl.nlgeom('OFF')

# Verify and re-apply target static lateral force
mapdl.fdelete('ALL', 'ALL')
for n in top_solera_nodes:
    mapdl.f(n, 'FX', (V_load * 1000.0) / 3.0)

try:
    mapdl.solve()
    mapdl.run("/POST1")
    ux_vals = []
    for n in sensor_nodes:
        ux = mapdl.get_value('NODE', n, 'U', 'X')
        ux_vals.append(ux)
    Delta_TOP = float(np.mean(ux_vals)) * 1000.0
    collapse = False
except Exception as e:
    print(f"\n>>> SOLVER CRASH / EXCEPTION: {e} <<<\n")
    Delta_TOP = 9999.0
    collapse = True
    # Ensure dead MAPDL instance is flagged – resurrection guard handles re-l
aunch next iteration.
    try:
        mapdl.exit()
    except Exception:
        pass

drift_log.append({
    'Iteration_ID': i,
    'Scenario_ID': target_scenario,
    'Delta_TOP_mm': Delta_TOP,
    'Solver_Collapse_Flag': collapse
})

# 9. Output Routing
df_trace = pd.DataFrame(trace_log)
df_drift = pd.DataFrame(drift_log)

trace_path = os.path.join(run_dir, 'stochastic_traceability_log.csv')
drift_path = os.path.join(run_dir, 'stochastic_drift_results.csv')

# Append mode to support manual dynamic escalation (Task 3.5)
df_trace.to_csv(trace_path, mode='a', index=False, header=not os.path.exists(trace_path))
df_drift.to_csv(drift_path, mode='a', index=False, header=not os.path.exists(drift_path))

mapdl.exit()
print(f"Scenario {target_scenario} completed. N = {n_iterations}.")

if __name__ == '__main__':

```

```

for scenario in ['A', 'B', 'C', 'E']:
    run_stochastic_scenario(scenario, n_iterations=100)

```

A.2.3 lhs_solver_GSHS.py

```

import os
import numpy as np
import pandas as pd
from scipy.stats import truncnorm
from ansys.mapdl.core import launch_mapdl

def build_gshs_model(mapdl, ks_modulus_MN, k_bond_fixed, opt_ke_N_mm):
    """
    Builds the complete GSHS Winkler Spring Bed model with explicit CMs.
    Extracts logic from pymapdl_macro_connections_v6.py and bahareque_base_model.py.
    """
    W, H, S = 2.20, 2.20, 0.10
    L = W / 2.0
    NL = int(round(H / S)) # 22
    XP = [0.0, L, W]
    D_col = 0.10 # Guadua outer diameter [m]
    Y_offset = 1e-5 # Base offset

    mapdl.clear()
    mapdl.run("/PREP7")

    # Materials
    mapdl.mp('EX', 1, 5.0e9)
    mapdl.mp('PRXY', 1, 0.20)
    mapdl.mp('DENS', 1, 600.0)
    mapdl.mp('EX', 2, 9.3e9)
    mapdl.mp('PRXY', 2, 0.35)
    mapdl.mp('DENS', 2, 508.3)
    mapdl.mp('EX', 3, 9.3e9)
    mapdl.mp('PRXY', 3, 0.35)
    mapdl.mp('DENS', 3, 508.3)

    # Sections
    mapdl.sectype(1, 'BEAM', 'CTUBE', 'GuaduaFrame')
    mapdl.secddata(0.04, 0.05)
    mapdl.sectype(2, 'BEAM', 'RECT', 'WoodSolera')
    mapdl.secddata(0.10, 0.05)
    mapdl.sectype(3, 'BEAM', 'RECT', 'LataFront')
    mapdl.secddata(0.015, 0.05)
    mapdl.secoffset('USER', 0.0575, 0)
    mapdl.sectype(4, 'BEAM', 'RECT', 'LataBack')
    mapdl.secddata(0.015, 0.05)
    mapdl.secoffset('USER', -0.0575, 0)

    # Element types
    mapdl.et(1, 'BEAM188')
    mapdl.et(2, 'COMBIN14', kop2=1) # Lata slip (UX)
    mapdl.et(3, 'COMBIN14', kop2=1) # Winkler Soil (UX)
    mapdl.et(4, 'COMBIN14', kop2=3) # Axial Bond (UZ)

```

```

# REAL 1: Lata slip
ke_N_m = opt_ke_N_mm * 1000.0
mapdl.r(1, ke_N_m)

# REAL 2: Winkler soil
k_winkler = ((ks_modulus_MN * 1e6) / 2.20) * S * D_col
mapdl.r(2, k_winkler)

# REAL 5: Axial Bond
k_axial_bond = k_bond_fixed * S * D_col
mapdl.r(5, k_axial_bond)

# Nodes
post_grid = {}
for lv in range(NL + 1):
    z = round(lv * S, 6)
    post_grid[lv] = {}
    for xi, xv in enumerate(XP):
        post_grid[lv][xi] = mapdl.n(None, xv, Y_offset, z)

lata_grid = {}
for lv in range(1, NL):
    z = round(lv * S, 6)
    lata_grid[lv] = {}
    for xi, xv in enumerate(XP):
        lata_grid[lv][xi] = mapdl.n(None, xv, Y_offset, z)

top_solera = [
    mapdl.n(None, 0.0, Y_offset, H),
    mapdl.n(None, L, Y_offset, H),
    mapdl.n(None, W, Y_offset, H),
]
diag_L_top = mapdl.n(None, 0.0, Y_offset, H)
diag_L_bot = mapdl.n(None, L, Y_offset, 0.0)
diag_R_top = mapdl.n(None, W, Y_offset, H)
diag_R_bot = mapdl.n(None, L, Y_offset, 0.0)

# Beam Elements & CMs
mapdl.type(1)
mapdl.mat(2)
mapdl.secnum(1)
for xi in range(3):
    for lv in range(NL):
        mapdl.e(post_grid[lv][xi], post_grid[lv + 1][xi])
        mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
        mapdl.esel('S', 'ELEM', '', 'EM')
        mapdl.run(f"CM, G_C{xi}_L{lv}, ELEM")

# Diagonals
dx_L, dz_L = L - 0.0, 0.0 - H
n_DL_13 = mapdl.n(None, 0.0 + dx_L/3.0, Y_offset, H + dz_L/3.0)
n_DL_23 = mapdl.n(None, 0.0 + 2*dx_L/3.0, Y_offset, H + 2*dz_L/3.0)

mapdl.e(diag_L_top, n_DL_13)

```

```

mapdl.e(n_DL_13, n_DL_23)
mapdl.e(n_DL_23, diag_L_bot)
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-2', 'EM')
mapdl.run("CM, D_L, ELEM")
mapdl.esel('S', 'ELEM', '', 'EM')
mapdl.run("CM, D_L_BOT, ELEM")

dx_R, dz_R = L - W, 0.0 - H
n_DR_13 = mapdl.n(None, W + dx_R/3.0, Y_offset, H + dz_R/3.0)
n_DR_23 = mapdl.n(None, W + 2*dx_R/3.0, Y_offset, H + 2*dz_R/3.0)

mapdl.e(diag_R_top, n_DR_13)
mapdl.e(n_DR_13, n_DR_23)
mapdl.e(n_DR_23, diag_R_bot)
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-2', 'EM')
mapdl.run("CM, D_R, ELEM")
mapdl.esel('S', 'ELEM', '', 'EM')
mapdl.run("CM, D_R_BOT, ELEM")

# Soleras
mapdl.mat(1)
mapdl.secnum(2)
mapdl.e(post_grid[0][0], post_grid[0][1])
mapdl.e(post_grid[0][1], post_grid[0][2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
mapdl.run("CM, S_BASE, ELEM")

mapdl.e(top_solera[0], top_solera[1])
mapdl.e(top_solera[1], top_solera[2])
mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
mapdl.run("CM, S_TOP, ELEM")

# Latas & CMs (Group Sampling requirement)
mapdl.type(1)
mapdl.mat(3)
for lv in range(1, NL):
    mapdl.secnum(3)
    mapdl.e(lata_grid[lv][0], lata_grid[lv][1])
    mapdl.e(lata_grid[lv][1], lata_grid[lv][2])
    mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
    mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
    mapdl.run(f"CM, L_F_{lv}, ELEM")

    mapdl.secnum(4)
    mapdl.e(lata_grid[lv][0], lata_grid[lv][1])
    mapdl.e(lata_grid[lv][1], lata_grid[lv][2])
    mapdl.run("*GET, EM, ELEM, 0, NUM, MAX")
    mapdl.esel('S', 'ELEM', '', 'EM-1', 'EM')
    mapdl.run(f"CM, L_B_{lv}, ELEM")

# CPs and Springs

```

```

cp_num = 1
def bind_nodes(nodes_list, dofs):
    nonlocal cp_num
    for dof in dofs:
        if len(nodes_list) == 2:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1])
        elif len(nodes_list) == 3:
            mapdl.cp(cp_num, dof, nodes_list[0], nodes_list[1], nodes_list[2])
        cp_num += 1

for lv in range(1, NL):
    for xi in range(3):
        bind_nodes([post_grid[lv][xi], lata_grid[lv][xi]], dofs=['UY', 'UZ', 'ROT
X'])

mapdl.type(2)
mapdl.real(1)
for lv in range(1, NL):
    for xi in range(3):
        mapdl.e(post_grid[lv][xi], lata_grid[lv][xi])

_joint_dofs = ['UY', 'UZ', 'ROTX', 'ROTY', 'ROTZ']
bind_nodes([top_solera[0], post_grid[NL][0], diag_L_top], dofs=_joint_dofs)
mapdl.type(2)
mapdl.real(1)
mapdl.e(top_solera[0], post_grid[NL][0])
mapdl.e(top_solera[0], diag_L_top)

bind_nodes([top_solera[1], post_grid[NL][1]], dofs=_joint_dofs)
mapdl.type(2)
mapdl.real(1)
mapdl.e(top_solera[1], post_grid[NL][1])

bind_nodes([top_solera[2], post_grid[NL][2], diag_R_top], dofs=_joint_dofs)
mapdl.type(2)
mapdl.real(1)
mapdl.e(top_solera[2], post_grid[NL][2])
mapdl.e(top_solera[2], diag_R_top)

bind_nodes([post_grid[0][1], diag_L_bot, diag_R_bot], dofs=_joint_dofs)
mapdl.type(2)
mapdl.real(1)
mapdl.e(post_grid[0][1], diag_L_bot)
mapdl.e(post_grid[0][1], diag_R_bot)

mapdl.allsel()
mapdl.esel('S', 'TYPE', '', 1)
mapdl.nsle('S')
mapdl.cm('BEAM_NODES', 'NODE')
mapdl.allsel()

# Anchor Nodes + Soil/Bond Springs
anchor_node_ids = []
for lv in range(NL + 1):
    z = round(lv * S, 6)

```

```

    for xi, xv in enumerate(XP):
        an = mapdl.n(None, xv, Y_offset + 1e-4, z)
        anchor_node_ids.append(an)
        col_node = post_grid[lv][xi]

        # COMBIN14 UX Winkler Lateral spring (REAL 2)
        mapdl.type(3)
        mapdl.real(2)
        mapdl.e(col_node, an)

        # COMBIN14 UZ Axial bond spring (REAL 5)
        mapdl.type(4)
        mapdl.real(5)
        mapdl.e(col_node, an)

mapdl.nsel('S', 'NODE', '', anchor_node_ids[0])
for aid in anchor_node_ids[1:]:
    mapdl.nsel('A', 'NODE', '', aid)
mapdl.cm('ANCHOR_NODES', 'NODE')
mapdl.allsel()

# Boundary Conditions
mapdl.slashsolu()
mapdl.antype('STATIC')
mapdl.nlgeom('OFF')

mapdl.cmsel('S', 'ANCHOR_NODES')
mapdl.d('ALL', 'UX', 0.0)
mapdl.d('ALL', 'UZ', 0.0)

mapdl.cmsel('S', 'S_BASE')
mapdl.nsle('S')
mapdl.d('ALL', 'ALL', 0.0)
mapdl.allsel()

return top_solera, post_grid

def run_stochastic_scenario(target_scenario, n_iterations):
    # Output Routing
    run_dir = os.path.join(os.getcwd(), 'Active_Simulation', 'Stochastic_LHS', 'GSHS'
, f'Scenario_{target_scenario}')
    os.makedirs(run_dir, exist_ok=True)

    mapdl = launch_mapdl(run_location=run_dir, override=True, jobname="lhs_GSHS", log
level="ERROR")

    # GSHS Baseline Constants
    opt_ke = 259.02
    V_load = 2.9983
    ks_base = 0.30
    kbond_base = 1.0
    S = 0.10
    D_col = 0.10

    # Build Model and extract references

```

```

top_solera_nodes, post_grid = build_gshs_model(mapdl, ks_base, kbond_base, opt_ke
)
sensor_nodes = [post_grid[21][xi] for xi in range(3)] # Calibration sensor: post
_grid_level 21, Z=2.10m

# Memory Sanitation: Save pristine baseline
mapdl.finish()
mapdl.save("pristine_baseline.db")

# LHS parameters
mu = 8404.44
sigma = 3075.02
EX_base = 9300.0
a_bound = (0 - mu) / sigma
b_bound = (EX_base - mu) / sigma

# Hazard Zone Mapping
zones = {
    'A': {
        'cms': ['G_C0_L0', 'G_C1_L0', 'G_C2_L0', 'G_C0_L21', 'G_C1_L21', 'G_C2_L2
1'],
        'bounds': (0.45, 0.70)
    },
    'B': {
        'cms': [
            'G_C0_L0', 'G_C0_L1', 'G_C0_L2', 'G_C0_L3', 'G_C0_L4',
            'G_C1_L0', 'G_C1_L1', 'G_C1_L2', 'G_C1_L3', 'G_C1_L4',
            'G_C2_L0', 'G_C2_L1', 'G_C2_L2', 'G_C2_L3', 'G_C2_L4'
        ],
        'bounds': (0.35, 0.60)
    },
    'C': {
        'cms': ['D_L_BOT', 'D_R_BOT'],
        'bounds': (0.20, 0.40)
    },
    'D': {
        'cms': ['L_F_1', 'L_F_2', 'L_F_3', 'L_F_4', 'L_F_5',
            'L_B_1', 'L_B_2', 'L_B_3', 'L_B_4', 'L_B_5'],
        'bounds': (0.15, 0.35)
    }
}

trace_log = []
drift_log = []
id_counter = 100

for i in range(1, n_iterations + 1):
    # Memory Sanitation & Processor Context
    mapdl.finish()
    mapdl.resume("pristine_baseline.db")
    mapdl.prep7()

    target_cms = []
    target_zones = ['A', 'B', 'C', 'D'] if target_scenario == 'E' else [target_sc
enario]

```

```

# Calculate discrete sample sizes
for z_key in target_zones:
    if z_key not in zones:
        continue
    z_data = zones[z_key]
    n_elem = len(z_data['cms'])
    m_min = int(n_elem * z_data['bounds'][0])
    m_max = int(n_elem * z_data['bounds'][1])

    m_max = max(1, m_max)
    if m_max >= m_min:
        m = np.random.randint(m_min, m_max + 1)
    else:
        m = m_min

    if m > 0:
        m = min(m, n_elem)
        selected = np.random.choice(z_data['cms'], size=m, replace=False)
        target_cms.extend(selected)

# EMODIF Implementation
for cm in target_cms:
    EX_rand = truncnorm.rvs(a_bound, b_bound, loc=mu, scale=sigma)
    D = EX_rand / EX_base
    ke_rand = opt_ke * D
    ks_rand = ks_base * D
    kbond_rand = kbond_base * D

    # Modify EX on BEAM188
    id_counter += 1
    mapdl.cmsel('S', cm)
    mapdl.mp('EX', id_counter, EX_rand * 1e6)
    mapdl.mp('PRXY', id_counter, 0.35)
    mapdl.emodif('ALL', 'MAT', id_counter)

# Independent Spring Degradation

# REAL 1 (ke)
mapdl.cmsel('S', cm)
mapdl.nsle()
mapdl.esln('S', 0)
mapdl.esel('R', 'REAL', '', 1)
mapdl.run("*GET, E_COUNT, ELEM, 0, COUNT")
if mapdl.parameters['E_COUNT'] > 0:
    id_counter += 1
    mapdl.r(id_counter, ke_rand * 1000.0)
    mapdl.emodif('ALL', 'REAL', id_counter)

# REAL 2 (ks)
mapdl.cmsel('S', cm)
mapdl.nsle()
mapdl.esln('S', 0)
mapdl.esel('R', 'REAL', '', 2)
mapdl.run("*GET, E_COUNT, ELEM, 0, COUNT")

```

```

    if mapdl.parameters['E_COUNT'] > 0:
        id_counter += 1
        # Mathematically align with V6 calibration: EX_soil (MPa) / H (2.20m)
        ks_1D = ((ks_rand * 1e6) / 2.20) * S * D_col
        mapdl.r(id_counter, ks_1D)
        mapdl.emodif('ALL', 'REAL', id_counter)

    # REAL 5 (kbond)
    mapdl.cmsel('S', cm)
    mapdl.nsle()
    mapdl.esln('S', 0)
    mapdl.esel('R', 'REAL', '', 5)
    mapdl.run("*GET, E_COUNT, ELEM, 0, COUNT")
    if mapdl.parameters['E_COUNT'] > 0:
        id_counter += 1
        kbond_1D = kbond_rand * 0.01
        mapdl.r(id_counter, kbond_1D)
        mapdl.emodif('ALL', 'REAL', id_counter)

    # Log traceability
    trace_log.append({
        'Iteration_ID': i,
        'Hazard_Zone': target_scenario,
        'Component_ID': cm,
        'Applied_EX_MPa': EX_rand,
        'Applied_ke_N_mm': ke_rand,
        'Applied_ks_MN_m3': ks_rand,
        'Applied_kbond_N_m_m': kbond_rand,
        'Damage_Factor_D': D
    })

    # Boundary Condition Re-Initialization & Solver Handling
    mapdl.allsel()
    mapdl.slashsolu()

    # Verify and re-apply target static lateral force (V_load = 2.9983 kN)
    # Distribute equally across 3 top nodes
    mapdl.fdelete('ALL', 'ALL')
    for n in top_solera_nodes:
        mapdl.f(n, 'FX', (V_load * 1000.0) / 3.0)

    try:
        mapdl.solve()
        mapdl.run("/POST1")
        ux_vals = []
        for n in sensor_nodes:
            ux = mapdl.get_value('NODE', n, 'U', 'X')
            ux_vals.append(ux)
        Delta_TOP = float(np.mean(ux_vals)) * 1000.0
        collapse = False
    except Exception as e:
        print(f"\n>>> SOLVER CRASH / EXCEPTION: {e} <<<\n")
        Delta_TOP = 9999.0
        collapse = True

```

```

        try:
            mapdl.exit()
        except Exception:
            pass

    drift_log.append({
        'Iteration_ID': i,
        'Scenario_ID': target_scenario,
        'Delta_TOP_mm': Delta_TOP,
        'Solver_Collapse_Flag': collapse
    })

# Output Routing
df_trace = pd.DataFrame(trace_log)
df_drift = pd.DataFrame(drift_log)

trace_path = os.path.join(run_dir, 'stochastic_traceability_log.csv')
drift_path = os.path.join(run_dir, 'stochastic_drift_results.csv')

# Append mode
df_trace.to_csv(trace_path, mode='a', index=False, header=not os.path.exists(trace_path))
df_drift.to_csv(drift_path, mode='a', index=False, header=not os.path.exists(drift_path))

    mapdl.exit()
    print(f"Scenario {target_scenario} completed. N = {n_iterations}.")

if __name__ == '__main__':
    # Production Execution (Task 3.3)
    for esc in ['A', 'B', 'C', 'D', 'E']:
        run_stochastic_scenario(esc, n_iterations=100)

```

DESARROLLO DEL APÉNDICE C: TABLAS DE RESULTADOS

C.1.1 anomalies_global_report.csv

Topology	Scenario	Iteration_ID	Delta_TOP_mm	Violation_Type	Damage_Factor_D_Z1	Damage_Factor_D_Z2	Damage_Factor_D_Z3	Damage_Factor_D_Z4	Applied_EX_MPa	Applied_ke_N_mm
GS	Scenario_A	1	0.934	Lower	nan	nan	nan	nan	1087.67	30.512
GS	Scenario_A	2	0.9944	Lower	nan	nan	nan	nan	5633.18	158.026
GS	Scenario_A	4	0.9917	Lower	nan	nan	nan	nan	5607.2	157.297
GS	Scenario_A	5	0.9855	Lower	nan	nan	nan	nan	8003.54	224.521
GS	Scenario_A	10	0.9713	Lower	nan	nan	nan	nan	3118.94	87.4946
GS	Scenario_A	11	0.9842	Lower	nan	nan	nan	nan	6276.27	176.066
GS	Scenario_A	13	0.981	Lower	nan	nan	nan	nan	4045.58	113.489
GS	Scenario_A	14	0.9874	Lower	nan	nan	nan	nan	8490.28	238.175
GS	Scenario_A	18	0.9793	Lower	nan	nan	nan	nan	7922.13	222.237
GS	Scenario_A	19	0.9799	Lower	nan	nan	nan	nan	6273.65	175.993
GS	Scenario_A	21	0.9933	Lower	nan	nan	nan	nan	5427.05	152.243
GS	Scenario_A	24	0.9933	Lower	nan	nan	nan	nan	9072.24	254.501
GS	Scenario_A	27	0.9863	Lower	nan	nan	nan	nan	4480.28	125.684
GS	Scenario_A	32	0.9829	Lower	nan	nan	nan	nan	5561.42	156.013
GS	Scenario_A	34	0.9608	Lower	nan	nan	nan	nan	1655.8	46.4497
GS	Scenario_A	36	0.9995	Lower	nan	nan	nan	nan	5664.9	158.916
GS	Scenario_A	39	0.993	Lower	nan	nan	nan	nan	6409.63	179.808
GS	Scenario_A	43	0.9563	Lower	nan	nan	nan	nan	1983.11	55.6316
GS	Scenario_A	46	0.9942	Lower	nan	nan	nan	nan	5770.38	161.875
GS	Scenario_A	47	0.988	Lower	nan	nan	nan	nan	6421.99	180.154
GS	Scenario_A	50	0.9899	Lower	nan	nan	nan	nan	8706.49	244.24

Topolog y	Scenari o	Iteration_I D	Delta_TOP _mm	Violation_Ty pe	Damage_Factor_ D_Z1	Damage_Factor_ D_Z2	Damage_Factor_ D_Z3	Damage_Factor_ D_Z4	Applied_EX_ MPa	Applied_ke_N _mm
GS	Scenario_A	55	0.9828	Lower	nan	nan	nan	nan	2515.18	70.5575
GS	Scenario_A	59	0.9983	Lower	nan	nan	nan	nan	7245.59	203.258
GS	Scenario_A	61	0.9936	Lower	nan	nan	nan	nan	5649.48	158.483
GS	Scenario_A	63	0.9845	Lower	nan	nan	nan	nan	5349.11	150.057
GS	Scenario_A	70	0.9855	Lower	nan	nan	nan	nan	4101.23	115.05
GS	Scenario_A	71	0.9903	Lower	nan	nan	nan	nan	5737.76	160.96
GS	Scenario_A	74	0.9804	Lower	nan	nan	nan	nan	3538.15	99.2546
GS	Scenario_A	78	0.9974	Lower	nan	nan	nan	nan	9013.74	252.86
GS	Scenario_A	83	0.9995	Lower	nan	nan	nan	nan	8230.24	230.881
GS	Scenario_A	84	0.9786	Lower	nan	nan	nan	nan	6690.87	187.697
GS	Scenario_A	87	0.9743	Lower	nan	nan	nan	nan	9061.61	254.202
GS	Scenario_A	90	0.9818	Lower	nan	nan	nan	nan	9127.9	256.062
GS	Scenario_A	92	0.9891	Lower	nan	nan	nan	nan	7264.52	203.789
GS	Scenario_A	93	0.8933	Lower	nan	nan	nan	nan	2568.98	72.0668
GS	Scenario_A	95	0.993	Lower	nan	nan	nan	nan	6551.39	183.784
GS	Scenario_B	20	2.0616	Upper	nan	nan	nan	nan	5850.1	164.111
GS	Scenario_E	12	0.9972	Lower	nan	nan	nan	nan	7574.97	212.498
GS	Scenario_E	30	2.0094	Upper	nan	nan	nan	nan	7741.52	217.171
GS	Scenario_E	42	2.1156	Upper	nan	nan	nan	nan	5503.6	154.391
GS	Scenario_E	70	2.8239	Upper	nan	nan	nan	nan	8076.92	226.579
GS	Scenario_E	73	2.4275	Upper	nan	nan	nan	nan	5119.02	143.602
GS	Scenario_E	88	0.8733	Lower	nan	nan	nan	nan	190.951	5.3567
GHS	Scenario_A	4	30.3841	Upper	nan	nan	nan	nan	388.148	10.8106
GHS	Scenario_A	6	7.835	Lower	nan	nan	nan	nan	7402.3	206.166

Topology	Scenario	Iteration_ID	Delta_TOP_mm	Violation_Type	Damage_Factor_D_Z1	Damage_Factor_D_Z2	Damage_Factor_D_Z3	Damage_Factor_D_Z4	Applied_EX_MPa	Applied_ke_N_mm
GHS	Scenario_A	11	7.7929	Lower	nan	nan	nan	nan	7097.02	197.663
GHS	Scenario_A	14	7.8801	Lower	nan	nan	nan	nan	8724.59	242.994
GHS	Scenario_A	16	7.827	Lower	nan	nan	nan	nan	2451.27	68.2719
GHS	Scenario_A	20	7.8757	Lower	nan	nan	nan	nan	8381.71	233.444
GHS	Scenario_A	25	7.8472	Lower	nan	nan	nan	nan	4451.42	123.979
GHS	Scenario_A	27	7.9194	Lower	nan	nan	nan	nan	8303.63	231.269
GHS	Scenario_A	37	7.8046	Lower	nan	nan	nan	nan	904.673	25.1966
GHS	Scenario_A	39	7.8597	Lower	nan	nan	nan	nan	7675.03	213.762
GHS	Scenario_A	40	7.9146	Lower	nan	nan	nan	nan	6657.47	185.421
GHS	Scenario_A	42	7.8998	Lower	nan	nan	nan	nan	8695.14	242.174
GHS	Scenario_A	44	7.9228	Lower	nan	nan	nan	nan	4906.48	136.654
GHS	Scenario_A	46	7.9152	Lower	nan	nan	nan	nan	7260.85	202.226
GHS	Scenario_A	47	7.858	Lower	nan	nan	nan	nan	2726.91	75.9488
GHS	Scenario_A	50	7.8295	Lower	nan	nan	nan	nan	4495.56	125.209
GHS	Scenario_A	52	7.8919	Lower	nan	nan	nan	nan	7674.8	213.756
GHS	Scenario_A	56	7.8666	Lower	nan	nan	nan	nan	6998.81	194.928
GHS	Scenario_A	65	7.8931	Lower	nan	nan	nan	nan	8092.21	225.381
GHS	Scenario_A	66	7.7746	Lower	nan	nan	nan	nan	3956.03	110.182
GHS	Scenario_A	72	7.9206	Lower	nan	nan	nan	nan	8005.64	222.97
GHS	Scenario_A	76	7.9098	Lower	nan	nan	nan	nan	9228.36	257.025
GHS	Scenario_A	85	7.7538	Lower	nan	nan	nan	nan	8078.29	224.993
GHS	Scenario_A	87	7.8576	Lower	nan	nan	nan	nan	4742.64	132.09
GHS	Scenario_A	88	14.0438	Upper	nan	nan	nan	nan	3385.35	94.2873
GHS	Scenario_A	89	7.8702	Lower	nan	nan	nan	nan	7229.6	201.356

Topology	Scenario	Iteration_ID	Delta_TOP_mm	Violation_Type	Damage_Factor_D_Z1	Damage_Factor_D_Z2	Damage_Factor_D_Z3	Damage_Factor_D_Z4	Applied_EX_MPa	Applied_ke_N_mm
GHS	Scenario_A	90	7.9261	Lower	nan	nan	nan	nan	6875.49	191.494
GHS	Scenario_A	92	7.8376	Lower	nan	nan	nan	nan	5037.81	140.311
GHS	Scenario_A	97	7.9069	Lower	nan	nan	nan	nan	4365.35	121.582
GHS	Scenario_A	99	7.9136	Lower	nan	nan	nan	nan	4016.29	111.86
GHS	Scenario_B	75	19.0637	Upper	nan	nan	nan	nan	8159.41	227.253
GHS	Scenario_E	64	36.8155	Upper	nan	nan	nan	nan	285.123	7.9411
GHS	Scenario_E	79	25.5154	Upper	nan	nan	nan	nan	7693.51	214.276
GHS	Scenario_E	80	25.864	Upper	nan	nan	nan	nan	687.715	19.154
GHS	Scenario_E	93	22.0011	Upper	nan	nan	nan	nan	8664.33	241.316
GSHS	Scenario_A	2	7.8425	Lower	nan	nan	nan	nan	6668.58	185.731
GSHS	Scenario_A	4	7.745	Lower	nan	nan	nan	nan	4445.48	123.814
GSHS	Scenario_A	6	7.7525	Lower	nan	nan	nan	nan	3486.29	97.0988
GSHS	Scenario_A	7	7.7691	Lower	nan	nan	nan	nan	6093.67	169.719
GSHS	Scenario_A	20	7.7748	Lower	nan	nan	nan	nan	5569.54	155.121
GSHS	Scenario_A	28	7.8459	Lower	nan	nan	nan	nan	5509.45	153.447
GSHS	Scenario_A	29	7.87	Lower	nan	nan	nan	nan	7441.23	207.25
GSHS	Scenario_A	30	7.8637	Lower	nan	nan	nan	nan	7436.38	207.115
GSHS	Scenario_A	39	7.8641	Lower	nan	nan	nan	nan	8880.32	247.331
GSHS	Scenario_A	42	7.717	Lower	nan	nan	nan	nan	3351.44	93.343
GSHS	Scenario_A	55	7.8536	Lower	nan	nan	nan	nan	6748.93	187.969
GSHS	Scenario_A	56	7.8517	Lower	nan	nan	nan	nan	7651.83	213.116
GSHS	Scenario_A	59	7.8644	Lower	nan	nan	nan	nan	5883.92	163.877
GSHS	Scenario_A	63	7.861	Lower	nan	nan	nan	nan	5913.68	164.706
GSHS	Scenario_A	64	7.8525	Lower	nan	nan	nan	nan	7127.33	198.508

Topology	Scenario	Iteration_ID	Delta_TOP_mm	Violation_Type	Damage_Factor_D_Z1	Damage_Factor_D_Z2	Damage_Factor_D_Z3	Damage_Factor_D_Z4	Applied_EX_MPa	Applied_ke_N_mm
GSHS	Scenario_A	65	7.6883	Lower	nan	nan	nan	nan	3474.07	96.7584
GSHS	Scenario_A	68	7.7862	Lower	nan	nan	nan	nan	3939.55	109.723
GSHS	Scenario_A	72	7.8313	Lower	nan	nan	nan	nan	9291.83	258.792
GSHS	Scenario_A	73	7.844	Lower	nan	nan	nan	nan	3540.03	98.5955
GSHS	Scenario_A	89	7.8061	Lower	nan	nan	nan	nan	8428.35	234.743
GSHS	Scenario_A	91	7.7429	Lower	nan	nan	nan	nan	7479.72	208.322
GSHS	Scenario_A	92	7.8155	Lower	nan	nan	nan	nan	7445.32	207.364
GSHS	Scenario_A	93	7.8557	Lower	nan	nan	nan	nan	9208.29	256.466
GSHS	Scenario_A	94	7.8558	Lower	nan	nan	nan	nan	8517.05	237.213
GSHS	Scenario_A	100	7.742	Lower	nan	nan	nan	nan	3995.9	111.292
GSHS	Scenario_B	70	14.2309	Upper	nan	nan	nan	nan	3253.17	90.6061
GSHS	Scenario_B	90	14.8799	Upper	nan	nan	nan	nan	5230.42	145.676
GSHS	Scenario_E	10	17.7138	Upper	nan	nan	nan	nan	4161.09	115.893
GSHS	Scenario_E	15	29.8161	Upper	nan	nan	nan	nan	2425.88	67.5647
GSHS	Scenario_E	47	15.6173	Upper	nan	nan	nan	nan	1669.09	46.4868
GSHS	Scenario_E	82	21.3147	Upper	nan	nan	nan	nan	5786.37	161.16

C.2.1 cm_element_list_GHS.csv

CM_Name	Element_ID
G_C0_L0	1
G_C0_L1	2
G_C0_L2	3
G_C0_L3	4
G_C0_L4	5
G_C0_L5	6
G_C0_L6	7
G_C0_L7	8
G_C0_L8	9
G_C0_L9	10
G_C0_L10	11
G_C0_L11	12
G_C0_L12	13
G_C0_L13	14
G_C0_L14	15
G_C0_L15	16
G_C0_L16	17
G_C0_L17	18
G_C0_L18	19
G_C0_L19	20
G_C0_L20	21
G_C0_L21	22
G_C1_L0	23
G_C1_L1	24
G_C1_L2	25
G_C1_L3	26
G_C1_L4	27
G_C1_L5	28
G_C1_L6	29
G_C1_L7	30
G_C1_L8	31
G_C1_L9	32
G_C1_L10	33
G_C1_L11	34
G_C1_L12	35
G_C1_L13	36
G_C1_L14	37
G_C1_L15	38
G_C1_L16	39
G_C1_L17	40
G_C1_L18	41
G_C1_L19	42
G_C1_L20	43
G_C1_L21	44
G_C2_L0	45
G_C2_L1	46
G_C2_L2	47
G_C2_L3	48
G_C2_L4	49
G_C2_L5	50
G_C2_L6	51
G_C2_L7	52
G_C2_L8	53
G_C2_L9	54
G_C2_L10	55
G_C2_L11	56
G_C2_L12	57
G_C2_L13	58
G_C2_L14	59
G_C2_L15	60
G_C2_L16	61
G_C2_L17	62
G_C2_L18	63
G_C2_L19	64
G_C2_L20	65
G_C2_L21	66

CM_Name	Element_ID
D_L	67
D_L	68
D_L	69
D_L_BOT	69
D_R	70
D_R	71
D_R	72
D_R_BOT	72
S_BASE	73
S_BASE	74
S_TOP	75
S_TOP	76
L_F_1	77
L_F_1	78
L_B_1	79
L_B_1	80
L_F_2	81
L_F_2	82
L_B_2	83
L_B_2	84
L_F_3	85
L_F_3	86
L_B_3	87
L_B_3	88
L_F_4	89
L_F_4	90
L_B_4	91
L_B_4	92
L_F_5	93
L_F_5	94
L_B_5	95
L_B_5	96
L_F_6	97
L_F_6	98
L_B_6	99
L_B_6	100
L_F_7	101
L_F_7	102
L_B_7	103
L_B_7	104
L_F_8	105
L_F_8	106
L_B_8	107
L_B_8	108
L_F_9	109
L_F_9	110
L_B_9	111
L_B_9	112
L_F_10	113
L_F_10	114
L_B_10	115
L_B_10	116
L_F_11	117
L_F_11	118
L_B_11	119
L_B_11	120
L_F_12	121
L_F_12	122
L_B_12	123
L_B_12	124
L_F_13	125
L_F_13	126
L_B_13	127
L_B_13	128
L_F_14	129
L_F_14	130
L_B_14	131
L_B_14	132
L_F_15	133

CM_Name	Element_ID
L_F_15	134
L_B_15	135
L_B_15	136
L_F_16	137
L_F_16	138
L_B_16	139
L_B_16	140
L_F_17	141
L_F_17	142
L_B_17	143
L_B_17	144
L_F_18	145
L_F_18	146
L_B_18	147
L_B_18	148
L_F_19	149
L_F_19	150
L_B_19	151
L_B_19	152
L_F_20	153
L_F_20	154
L_B_20	155
L_B_20	156
L_F_21	157
L_F_21	158
L_B_21	159
L_B_21	160

C.2.2 cm_element_list_GS.csv

CM_Name	Element_ID
G_C0_L0	1
G_C0_L1	2
G_C0_L2	3
G_C0_L3	4
G_C0_L4	5
G_C0_L5	6
G_C0_L6	7
G_C0_L7	8
G_C0_L8	9
G_C0_L9	10
G_C0_L10	11
G_C0_L11	12
G_C0_L12	13
G_C0_L13	14
G_C0_L14	15
G_C0_L15	16
G_C0_L16	17
G_C0_L17	18
G_C0_L18	19
G_C0_L19	20
G_C0_L20	21
G_C0_L21	22
G_C1_L0	23
G_C1_L1	24
G_C1_L2	25
G_C1_L3	26
G_C1_L4	27
G_C1_L5	28
G_C1_L6	29
G_C1_L7	30
G_C1_L8	31
G_C1_L9	32
G_C1_L10	33
G_C1_L11	34
G_C1_L12	35
G_C1_L13	36

CM_Name	Element_ID
G_C1_L14	37
G_C1_L15	38
G_C1_L16	39
G_C1_L17	40
G_C1_L18	41
G_C1_L19	42
G_C1_L20	43
G_C1_L21	44
G_C2_L0	45
G_C2_L1	46
G_C2_L2	47
G_C2_L3	48
G_C2_L4	49
G_C2_L5	50
G_C2_L6	51
G_C2_L7	52
G_C2_L8	53
G_C2_L9	54
G_C2_L10	55
G_C2_L11	56
G_C2_L12	57
G_C2_L13	58
G_C2_L14	59
G_C2_L15	60
G_C2_L16	61
G_C2_L17	62
G_C2_L18	63
G_C2_L19	64
G_C2_L20	65
G_C2_L21	66
D_L	71
D_L	72
D_L	73
D_L_BOT	73
D_R	74
D_R	75
D_R	76
D_R_BOT	76
S_BASE	67
S_BASE	68
S_TOP	69
S_TOP	70

C.2.3 cm_element_list_GSHS.csv

CM_Name	Element_ID
G_C0_L0	1
G_C0_L1	2
G_C0_L2	3
G_C0_L3	4
G_C0_L4	5
G_C0_L5	6
G_C0_L6	7
G_C0_L7	8
G_C0_L8	9
G_C0_L9	10
G_C0_L10	11
G_C0_L11	12
G_C0_L12	13
G_C0_L13	14
G_C0_L14	15
G_C0_L15	16
G_C0_L16	17
G_C0_L17	18
G_C0_L18	19
G_C0_L19	20
G_C0_L20	21

CM_Name	Element_ID
G_C0_L21	22
G_C1_L0	23
G_C1_L1	24
G_C1_L2	25
G_C1_L3	26
G_C1_L4	27
G_C1_L5	28
G_C1_L6	29
G_C1_L7	30
G_C1_L8	31
G_C1_L9	32
G_C1_L10	33
G_C1_L11	34
G_C1_L12	35
G_C1_L13	36
G_C1_L14	37
G_C1_L15	38
G_C1_L16	39
G_C1_L17	40
G_C1_L18	41
G_C1_L19	42
G_C1_L20	43
G_C1_L21	44
G_C2_L0	45
G_C2_L1	46
G_C2_L2	47
G_C2_L3	48
G_C2_L4	49
G_C2_L5	50
G_C2_L6	51
G_C2_L7	52
G_C2_L8	53
G_C2_L9	54
G_C2_L10	55
G_C2_L11	56
G_C2_L12	57
G_C2_L13	58
G_C2_L14	59
G_C2_L15	60
G_C2_L16	61
G_C2_L17	62
G_C2_L18	63
G_C2_L19	64
G_C2_L20	65
G_C2_L21	66
D_L	67
D_L	68
D_L	69
D_L_BOT	69
D_R	70
D_R	71
D_R	72
D_R_BOT	72
S_BASE	73
S_BASE	74
S_TOP	75
S_TOP	76
L_F_1	77
L_F_1	78
L_B_1	79
L_B_1	80
L_F_2	81
L_F_2	82
L_B_2	83
L_B_2	84
L_F_3	85
L_F_3	86
L_B_3	87
L_B_3	88

CM_Name	Element_ID
L_F_4	89
L_F_4	90
L_B_4	91
L_B_4	92
L_F_5	93
L_F_5	94
L_B_5	95
L_B_5	96
L_F_6	97
L_F_6	98
L_B_6	99
L_B_6	100
L_F_7	101
L_F_7	102
L_B_7	103
L_B_7	104
L_F_8	105
L_F_8	106
L_B_8	107
L_B_8	108
L_F_9	109
L_F_9	110
L_B_9	111
L_B_9	112
L_F_10	113
L_F_10	114
L_B_10	115
L_B_10	116
L_F_11	117
L_F_11	118
L_B_11	119
L_B_11	120
L_F_12	121
L_F_12	122
L_B_12	123
L_B_12	124
L_F_13	125
L_F_13	126
L_B_13	127
L_B_13	128
L_F_14	129
L_F_14	130
L_B_14	131
L_B_14	132
L_F_15	133
L_F_15	134
L_B_15	135
L_B_15	136
L_F_16	137
L_F_16	138
L_B_16	139
L_B_16	140
L_F_17	141
L_F_17	142
L_B_17	143
L_B_17	144
L_F_18	145
L_F_18	146
L_B_18	147
L_B_18	148
L_F_19	149
L_F_19	150
L_B_19	151
L_B_19	152
L_F_20	153
L_F_20	154
L_B_20	155
L_B_20	156
L_F_21	157

CM_Name	Element_ID
L_F_21	158
L_B_21	159
L_B_21	160

C.1.2 cov_convergence_summary.csv

Topology	Scenario	N_Valid	COV_90	COV_Final	Delta_COV_pct
GS	Scenario_A	100	0.1049	0.1076	2.59
GS	Scenario_B	100	0.1811	0.1753	3.19
GS	Scenario_C	100	0.0837	0.0815	2.63
GS	Scenario_E	100	0.2516	0.2468	1.93
GHS	Scenario_A	100	0.2965	0.2848	3.95
GHS	Scenario_B	100	0.1763	0.1692	4.01
GHS	Scenario_C	100	0.0498	0.0481	3.48
GHS	Scenario_D	100	0	0	0
GHS	Scenario_E	100	0.3969	0.394	0.73
GSHS	Scenario_A	100	0.1257	0.1221	2.86
GSHS	Scenario_B	100	0.1313	0.1277	2.74
GSHS	Scenario_C	100	0.0679	0.0678	0.16
GSHS	Scenario_D	100	0	0	0
GSHS	Scenario_E	100	0.3078	0.2959	3.87

C.1.3 fragility_parameters_summary.csv

Topology	Scenario	N_total	N_valid	N_collaps	mu	sigma	final_cov	P_exceed_D S1	P_exceed_D S2	P_exceed_D S3
GS	A	100	100	0	0.05 14	0.098 1	0.1076	0.0401	0.0002	0
GS	B	100	100	0	0.11 17	0.146	0.1753	0.2226	0.0221	0
GS	C	100	100	0	0.04 07	0.071 8	0.0815	0.0055	0	0
GS	E	100	100	0	0.17 52	0.196 1	0.2468	0.4033	0.1201	0.0041
GHS	A	100	100	0	2.16 85	0.183 4	0.2848	0.2473	0.0468	0.0059
GHS	B	100	100	0	2.16 56	0.134 4	0.1692	0.1701	0.0104	0.0003
GHS	C	100	100	0	2.09 43	0.045 5	0.0481	0	0	0
GHS	D	100	100	0	2.07 1	0	0	0	0	0
GHS	E	100	100	0	2.26 04	0.241 8	0.394	0.4451	0.1862	0.0631
GSHS	A	100	100	0	2.13 42	0.109	0.1221	0.0815	0.0011	0
GSHS	B	100	100	0	2.14 75	0.107 8	0.1277	0.0991	0.0014	0
GSHS	C	100	100	0	2.10 1	0.063 1	0.0678	0.0017	0	0
GSHS	D	100	100	0	2.06 47	0	0	0	0	0
GSHS	E	100	100	0	2.23 13	0.199 8	0.2959	0.3917	0.1176	0.0251

C.3.1 stochastic_drift_results_GHS_A.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	A	8.135	False
2	A	8.0859	False
3	A	10.3188	False
4	A	30.3841	False
5	A	8.0069	False
6	A	7.835	False
7	A	8.6584	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
8	A	7.9856	False
9	A	11.1223	False
10	A	12.5114	False
11	A	7.7929	False
12	A	7.9384	False
13	A	7.9759	False
14	A	7.8801	False
15	A	9.9745	False
16	A	7.827	False
17	A	8.0109	False
18	A	8.0417	False
19	A	12.1092	False
20	A	7.8757	False
21	A	8.4212	False
22	A	8.1581	False
23	A	10.2615	False
24	A	8.3781	False
25	A	7.8472	False
26	A	8.1479	False
27	A	7.9194	False
28	A	8.6083	False
29	A	8.7872	False
30	A	7.9748	False
31	A	13.3215	False
32	A	13.0895	False
33	A	9.2104	False
34	A	8.3864	False
35	A	8.352	False
36	A	7.9582	False
37	A	7.8046	False
38	A	8.131	False
39	A	7.8597	False
40	A	7.9146	False
41	A	8.6433	False
42	A	7.8998	False
43	A	10.1024	False
44	A	7.9228	False
45	A	7.964	False
46	A	7.9152	False
47	A	7.858	False
48	A	7.9376	False
49	A	8.1855	False
50	A	7.8295	False
51	A	7.9578	False
52	A	7.8919	False
53	A	10.1552	False
54	A	8.4402	False
55	A	8.4352	False
56	A	7.8666	False
57	A	8.0585	False
58	A	8.1596	False
59	A	11.4059	False
60	A	8.7937	False
61	A	9.0957	False
62	A	8.3606	False
63	A	9.1842	False
64	A	10.0735	False
65	A	7.8931	False
66	A	7.7746	False
67	A	9.538	False
68	A	7.979	False
69	A	9.1488	False
70	A	12.5573	False
71	A	8.6024	False
72	A	7.9206	False
73	A	8.9917	False
74	A	8.35	False
75	A	7.9316	False
76	A	7.9098	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
77	A	9.1836	False
78	A	8.4836	False
79	A	8.5034	False
80	A	9.7996	False
81	A	8.5011	False
82	A	7.9673	False
83	A	7.9452	False
84	A	7.9649	False
85	A	7.7538	False
86	A	10.4929	False
87	A	7.8576	False
88	A	14.0438	False
89	A	7.8702	False
90	A	7.9261	False
91	A	8.39	False
92	A	7.8376	False
93	A	8.0367	False
94	A	8.4799	False
95	A	9.6824	False
96	A	7.939	False
97	A	7.9069	False
98	A	8.0586	False
99	A	7.9136	False
100	A	9.5767	False

C.3.2 stochastic_drift_results_GHS_B.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	B	10.416	False
2	B	8.7502	False
3	B	8.2076	False
4	B	8.8014	False
5	B	8.2036	False
6	B	8.0048	False
7	B	8.6775	False
8	B	8.1673	False
9	B	8.2675	False
10	B	8.1129	False
11	B	8.0823	False
12	B	8.2115	False
13	B	9.9333	False
14	B	9.7044	False
15	B	8.1976	False
16	B	8.1045	False
17	B	7.9931	False
18	B	8.3484	False
19	B	8.1679	False
20	B	8.0551	False
21	B	8.1064	False
22	B	8.2463	False
23	B	8.1359	False
24	B	8.2517	False
25	B	9.004	False
26	B	8.1304	False
27	B	10.9446	False
28	B	8.1336	False
29	B	8.754	False
30	B	8.3135	False
31	B	10.4859	False
32	B	8.1266	False
33	B	8.5241	False
34	B	9.1991	False
35	B	8.1546	False
36	B	8.1647	False
37	B	8.0498	False
38	B	8.0423	False
39	B	11.2533	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
40	B	8.056	False
41	B	8.0709	False
42	B	12.3166	False
43	B	8.2847	False
44	B	8.1365	False
45	B	8.3611	False
46	B	8.5153	False
47	B	8.1404	False
48	B	8.0543	False
49	B	10.1731	False
50	B	8.1912	False
51	B	8.1004	False
52	B	8.2383	False
53	B	8.3715	False
54	B	8.0932	False
55	B	8.1129	False
56	B	13.2051	False
57	B	8.3085	False
58	B	8.716	False
59	B	10.8469	False
60	B	8.7755	False
61	B	8.549	False
62	B	8.1399	False
63	B	8.4218	False
64	B	8.3409	False
65	B	8.0487	False
66	B	10.9727	False
67	B	8.1374	False
68	B	8.1335	False
69	B	9.98	False
70	B	8.1883	False
71	B	10.8504	False
72	B	8.0219	False
73	B	8.0479	False
74	B	8.7575	False
75	B	19.0637	False
76	B	8.1836	False
77	B	10.2267	False
78	B	8.0568	False
79	B	8.1653	False
80	B	8.2433	False
81	B	8.1039	False
82	B	8.1077	False
83	B	12.9647	False
84	B	8.5635	False
85	B	8.2307	False
86	B	8.2314	False
87	B	8.0628	False
88	B	8.6442	False
89	B	8.3962	False
90	B	8.2402	False
91	B	9.1577	False
92	B	9.0126	False
93	B	9.8648	False
94	B	8.2106	False
95	B	8.1196	False
96	B	8.1861	False
97	B	8.4839	False
98	B	8.2643	False
99	B	8.1996	False
100	B	8.0383	False

C.3.3 stochastic_drift_results_GHS_C.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	C	7.9324	False
2	C	8.3377	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
3	C	7.9324	False
4	C	7.9324	False
5	C	7.9324	False
6	C	8.046	False
7	C	7.9473	False
8	C	7.9324	False
9	C	7.9324	False
10	C	7.9324	False
11	C	7.9324	False
12	C	7.9324	False
13	C	8.0753	False
14	C	7.9324	False
15	C	8.6521	False
16	C	7.9324	False
17	C	7.9324	False
18	C	7.9545	False
19	C	7.9324	False
20	C	7.9324	False
21	C	7.9324	False
22	C	7.9324	False
23	C	8.0406	False
24	C	7.9592	False
25	C	9.0022	False
26	C	7.9324	False
27	C	7.9324	False
28	C	9.2073	False
29	C	8.2475	False
30	C	7.9324	False
31	C	8.2203	False
32	C	8.5037	False
33	C	7.9324	False
34	C	9.2848	False
35	C	7.9324	False
36	C	7.9324	False
37	C	7.9324	False
38	C	7.9324	False
39	C	9.8272	False
40	C	7.9324	False
41	C	7.9324	False
42	C	7.9324	False
43	C	8.2541	False
44	C	9.1607	False
45	C	8.5861	False
46	C	7.9324	False
47	C	9.2679	False
48	C	7.9324	False
49	C	7.9324	False
50	C	7.9324	False
51	C	7.9324	False
52	C	7.9324	False
53	C	8.0328	False
54	C	8.628	False
55	C	7.9324	False
56	C	7.9324	False
57	C	8.1164	False
58	C	7.9324	False
59	C	9.3129	False
60	C	9.0041	False
61	C	7.9324	False
62	C	7.9324	False
63	C	8.7667	False
64	C	7.9324	False
65	C	7.9324	False
66	C	7.9324	False
67	C	7.9324	False
68	C	8.0922	False
69	C	7.9324	False
70	C	7.9324	False
71	C	7.9324	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
72	C	8.0171	False
73	C	7.9324	False
74	C	7.9324	False
75	C	7.9324	False
76	C	7.9324	False
77	C	8.4206	False
78	C	7.9324	False
79	C	7.9324	False
80	C	8.3744	False
81	C	7.9324	False
82	C	8.1298	False
83	C	8.2005	False
84	C	7.9324	False
85	C	7.9324	False
86	C	7.9324	False
87	C	7.9324	False
88	C	7.9324	False
89	C	7.9324	False
90	C	7.9324	False
91	C	7.9324	False
92	C	7.9324	False
93	C	8.168	False
94	C	8.1783	False
95	C	7.9324	False
96	C	8.3825	False
97	C	8.1426	False
98	C	8.6427	False
99	C	7.9324	False
100	C	7.9324	False

C.3.4 stochastic_drift_results_GHS_D.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	D	7.9324	False
2	D	7.9324	False
3	D	7.9324	False
4	D	7.9324	False
5	D	7.9324	False
6	D	7.9324	False
7	D	7.9324	False
8	D	7.9324	False
9	D	7.9324	False
10	D	7.9324	False
11	D	7.9324	False
12	D	7.9324	False
13	D	7.9324	False
14	D	7.9324	False
15	D	7.9324	False
16	D	7.9324	False
17	D	7.9324	False
18	D	7.9324	False
19	D	7.9324	False
20	D	7.9324	False
21	D	7.9324	False
22	D	7.9324	False
23	D	7.9324	False
24	D	7.9324	False
25	D	7.9324	False
26	D	7.9324	False
27	D	7.9324	False
28	D	7.9324	False
29	D	7.9324	False
30	D	7.9324	False
31	D	7.9324	False
32	D	7.9324	False
33	D	7.9324	False
34	D	7.9324	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
35	D	7.9324	False
36	D	7.9324	False
37	D	7.9324	False
38	D	7.9324	False
39	D	7.9324	False
40	D	7.9324	False
41	D	7.9324	False
42	D	7.9324	False
43	D	7.9324	False
44	D	7.9324	False
45	D	7.9324	False
46	D	7.9324	False
47	D	7.9324	False
48	D	7.9324	False
49	D	7.9324	False
50	D	7.9324	False
51	D	7.9324	False
52	D	7.9324	False
53	D	7.9324	False
54	D	7.9324	False
55	D	7.9324	False
56	D	7.9324	False
57	D	7.9324	False
58	D	7.9324	False
59	D	7.9324	False
60	D	7.9324	False
61	D	7.9324	False
62	D	7.9324	False
63	D	7.9324	False
64	D	7.9324	False
65	D	7.9324	False
66	D	7.9324	False
67	D	7.9324	False
68	D	7.9324	False
69	D	7.9324	False
70	D	7.9324	False
71	D	7.9324	False
72	D	7.9324	False
73	D	7.9324	False
74	D	7.9324	False
75	D	7.9324	False
76	D	7.9324	False
77	D	7.9324	False
78	D	7.9324	False
79	D	7.9324	False
80	D	7.9324	False
81	D	7.9324	False
82	D	7.9324	False
83	D	7.9324	False
84	D	7.9324	False
85	D	7.9324	False
86	D	7.9324	False
87	D	7.9324	False
88	D	7.9324	False
89	D	7.9324	False
90	D	7.9324	False
91	D	7.9324	False
92	D	7.9324	False
93	D	7.9324	False
94	D	7.9324	False
95	D	7.9324	False
96	D	7.9324	False
97	D	7.9324	False
98	D	7.9324	False
99	D	7.9324	False
100	D	7.9324	False

C.3.5 stochastic_drift_results_GHS_E.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	E	8.7415	False
2	E	8.5069	False
3	E	9.0259	False
4	E	8.132	False
5	E	9.5276	False
6	E	8.2246	False
7	E	8.0692	False
8	E	8.4917	False
9	E	9.1595	False
10	E	8.304	False
11	E	10.0094	False
12	E	11.2535	False
13	E	9.024	False
14	E	11.8162	False
15	E	9.4469	False
16	E	13.2598	False
17	E	8.5247	False
18	E	8.9151	False
19	E	8.0444	False
20	E	8.9112	False
21	E	8.7015	False
22	E	9.1339	False
23	E	8.4419	False
24	E	8.1975	False
25	E	8.2024	False
26	E	9.3902	False
27	E	9.5345	False
28	E	8.3241	False
29	E	10.1261	False
30	E	8.8575	False
31	E	8.5941	False
32	E	8.0361	False
33	E	10.0407	False
34	E	12.278	False
35	E	9.8784	False
36	E	8.2091	False
37	E	8.742	False
38	E	8.1693	False
39	E	8.3966	False
40	E	10.0073	False
41	E	8.6576	False
42	E	9.5984	False
43	E	9.4565	False
44	E	8.2718	False
45	E	8.7767	False
46	E	8.4028	False
47	E	10.4793	False
48	E	11.813	False
49	E	9.1576	False
50	E	8.6052	False
51	E	11.4871	False
52	E	9.1046	False
53	E	9.3636	False
54	E	8.731	False
55	E	8.5273	False
56	E	9.5246	False
57	E	10.5654	False
58	E	8.9956	False
59	E	8.0723	False
60	E	9.0773	False
61	E	10.7435	False
62	E	8.2693	False
63	E	8.381	False
64	E	36.8155	False
65	E	8.4666	False
66	E	8.1159	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
67	E	8.7875	False
68	E	11.1147	False
69	E	10.7046	False
70	E	8.2857	False
71	E	8.8302	False
72	E	8.406	False
73	E	8.5641	False
74	E	8.5886	False
75	E	8.9519	False
76	E	9.2995	False
77	E	9.8428	False
78	E	8.5247	False
79	E	25.5154	False
80	E	25.864	False
81	E	8.9424	False
82	E	9.0529	False
83	E	10.3606	False
84	E	8.7295	False
85	E	8.3788	False
86	E	10.9927	False
87	E	9.5194	False
88	E	8.3101	False
89	E	8.2738	False
90	E	10.6241	False
91	E	9.0338	False
92	E	11.774	False
93	E	22.0011	False
94	E	8.2871	False
95	E	8.8351	False
96	E	9.5148	False
97	E	8.8607	False
98	E	8.1555	False
99	E	10.5699	False
100	E	11.9139	False

C.3.6 stochastic_drift_results_GSHS_A.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	A	13.4173	False
2	A	7.8425	False
3	A	8.2342	False
4	A	7.745	False
5	A	7.9212	False
6	A	7.7525	False
7	A	7.7691	False
8	A	7.9051	False
9	A	9.0013	False
10	A	8.4956	False
11	A	12.4034	False
12	A	7.8849	False
13	A	9.5905	False
14	A	7.8833	False
15	A	9.186	False
16	A	7.8942	False
17	A	8.0269	False
18	A	7.9371	False
19	A	8.1048	False
20	A	7.7748	False
21	A	8.1644	False
22	A	8.7425	False
23	A	8.8537	False
24	A	7.9812	False
25	A	11.0869	False
26	A	9.0863	False
27	A	8.7384	False
28	A	7.8459	False
29	A	7.87	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
30	A	7.8637	False
31	A	7.9454	False
32	A	8.8807	False
33	A	8.4317	False
34	A	7.8904	False
35	A	8.2818	False
36	A	7.9305	False
37	A	9.4176	False
38	A	7.9131	False
39	A	7.8641	False
40	A	9.8342	False
41	A	9.0558	False
42	A	7.717	False
43	A	8.4791	False
44	A	7.8726	False
45	A	8.7384	False
46	A	7.8817	False
47	A	10.1007	False
48	A	7.9472	False
49	A	9.4908	False
50	A	8.0044	False
51	A	7.9088	False
52	A	7.9396	False
53	A	8.8672	False
54	A	7.88	False
55	A	7.8536	False
56	A	7.8517	False
57	A	8.0973	False
58	A	8.092	False
59	A	7.8644	False
60	A	7.9442	False
61	A	9.3643	False
62	A	7.8723	False
63	A	7.861	False
64	A	7.8525	False
65	A	7.6883	False
66	A	8.6832	False
67	A	9.8788	False
68	A	7.7862	False
69	A	7.8893	False
70	A	8.1111	False
71	A	8.7911	False
72	A	7.8313	False
73	A	7.844	False
74	A	7.8915	False
75	A	8.4102	False
76	A	7.8986	False
77	A	9.5503	False
78	A	10.3456	False
79	A	8.002	False
80	A	7.9132	False
81	A	8.5944	False
82	A	10.6644	False
83	A	9.5724	False
84	A	9.462	False
85	A	8.0321	False
86	A	11.017	False
87	A	8.9687	False
88	A	8.6009	False
89	A	7.8061	False
90	A	11.3472	False
91	A	7.7429	False
92	A	7.8155	False
93	A	7.8557	False
94	A	7.8558	False
95	A	8.6608	False
96	A	7.9782	False
97	A	7.9167	False
98	A	8.0098	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
99	A	8.3583	False
100	A	7.742	False

C.3.7 stochastic_drift_results_GSHS_B.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	B	9.04	False
2	B	9.2155	False
3	B	9.1524	False
4	B	8.12	False
5	B	8.1234	False
6	B	8.0808	False
7	B	8.1832	False
8	B	8.2098	False
9	B	8.2598	False
10	B	8.0472	False
11	B	9.4685	False
12	B	8.2849	False
13	B	10.3901	False
14	B	8.031	False
15	B	8.064	False
16	B	8.0166	False
17	B	8.2571	False
18	B	8.0919	False
19	B	8.08	False
20	B	8.0446	False
21	B	8.0852	False
22	B	9.2607	False
23	B	8.8806	False
24	B	10.2099	False
25	B	9.1037	False
26	B	8.2149	False
27	B	8.0692	False
28	B	8.4221	False
29	B	8.14	False
30	B	8.6038	False
31	B	8.0936	False
32	B	7.9894	False
33	B	9.7542	False
34	B	7.9982	False
35	B	8.4462	False
36	B	9.4238	False
37	B	10.4912	False
38	B	9.1208	False
39	B	8.0895	False
40	B	8.0923	False
41	B	9.6325	False
42	B	7.9736	False
43	B	8.079	False
44	B	7.9866	False
45	B	8.1467	False
46	B	7.9692	False
47	B	8.0809	False
48	B	8.0935	False
49	B	8.4652	False
50	B	8.4393	False
51	B	11.084	False
52	B	8.054	False
53	B	8.1129	False
54	B	7.9776	False
55	B	7.9203	False
56	B	8.5539	False
57	B	8.6475	False
58	B	9.7315	False
59	B	7.9837	False
60	B	8.9188	False
61	B	7.9898	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
62	B	8.0597	False
63	B	8.2386	False
64	B	7.974	False
65	B	8.1595	False
66	B	8.3972	False
67	B	8.3297	False
68	B	8.014	False
69	B	8.0232	False
70	B	14.2309	False
71	B	8.2102	False
72	B	8.8322	False
73	B	8.1057	False
74	B	8.312	False
75	B	8.0719	False
76	B	10.0654	False
77	B	8.6548	False
78	B	8.0852	False
79	B	9.2135	False
80	B	8.1912	False
81	B	8.0231	False
82	B	9.9586	False
83	B	8.0387	False
84	B	10.0789	False
85	B	8.1645	False
86	B	8.7462	False
87	B	7.9739	False
88	B	8.1468	False
89	B	8.346	False
90	B	14.8799	False
91	B	8.1503	False
92	B	7.9843	False
93	B	8.1136	False
94	B	10.0909	False
95	B	7.9799	False
96	B	8.0402	False
97	B	8.0885	False
98	B	8.4218	False
99	B	8.0593	False
100	B	7.95	False

C.3.8 stochastic_drift_results_GSHS_C.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	C	9.5312	False
2	C	7.8827	False
3	C	7.8827	False
4	C	8.219	False
5	C	8.1966	False
6	C	7.8827	False
7	C	9.7067	False
8	C	9.5339	False
9	C	9.2684	False
10	C	7.8827	False
11	C	7.8953	False
12	C	7.8827	False
13	C	9.0036	False
14	C	8.3235	False
15	C	8.8265	False
16	C	7.9775	False
17	C	7.8827	False
18	C	7.8827	False
19	C	8.0637	False
20	C	7.8827	False
21	C	7.8827	False
22	C	7.9545	False
23	C	10.8453	False
24	C	7.8827	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
25	C	8.5696	False
26	C	7.8827	False
27	C	7.8827	False
28	C	7.8827	False
29	C	7.8827	False
30	C	8.2775	False
31	C	9.4408	False
32	C	7.8827	False
33	C	7.8827	False
34	C	7.9747	False
35	C	9.0497	False
36	C	7.8827	False
37	C	7.8827	False
38	C	7.8827	False
39	C	7.8827	False
40	C	8.0477	False
41	C	7.8827	False
42	C	8.1684	False
43	C	7.8827	False
44	C	7.8827	False
45	C	8.3788	False
46	C	8.1065	False
47	C	8.4707	False
48	C	7.8827	False
49	C	7.8827	False
50	C	7.8827	False
51	C	7.8827	False
52	C	8.0384	False
53	C	7.8827	False
54	C	8.1297	False
55	C	7.8827	False
56	C	7.8827	False
57	C	7.8827	False
58	C	8.8906	False
59	C	7.8827	False
60	C	7.8827	False
61	C	7.8827	False
62	C	7.8827	False
63	C	7.8827	False
64	C	7.8827	False
65	C	7.8827	False
66	C	7.891	False
67	C	8.1148	False
68	C	8.2971	False
69	C	7.8827	False
70	C	7.8827	False
71	C	7.8827	False
72	C	8.6954	False
73	C	9.1966	False
74	C	7.8827	False
75	C	7.8827	False
76	C	7.8827	False
77	C	8.6526	False
78	C	7.8827	False
79	C	7.8827	False
80	C	7.8827	False
81	C	9.3485	False
82	C	7.8827	False
83	C	8.8909	False
84	C	7.8827	False
85	C	8.382	False
86	C	8.9576	False
87	C	7.8827	False
88	C	7.8827	False
89	C	7.8827	False
90	C	8.1825	False
91	C	7.8827	False
92	C	8.2318	False
93	C	7.9249	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
94	C	7.8827	False
95	C	7.8827	False
96	C	7.8827	False
97	C	8.1592	False
98	C	9.7478	False
99	C	8.2987	False
100	C	7.8827	False

C.3.9 stochastic_drift_results_GSHS_D.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	D	7.8827	False
2	D	7.8827	False
3	D	7.8827	False
4	D	7.8827	False
5	D	7.8827	False
6	D	7.8827	False
7	D	7.8827	False
8	D	7.8827	False
9	D	7.8827	False
10	D	7.8827	False
11	D	7.8827	False
12	D	7.8827	False
13	D	7.8827	False
14	D	7.8827	False
15	D	7.8827	False
16	D	7.8827	False
17	D	7.8827	False
18	D	7.8827	False
19	D	7.8827	False
20	D	7.8827	False
21	D	7.8827	False
22	D	7.8827	False
23	D	7.8827	False
24	D	7.8827	False
25	D	7.8827	False
26	D	7.8827	False
27	D	7.8827	False
28	D	7.8827	False
29	D	7.8827	False
30	D	7.8827	False
31	D	7.8827	False
32	D	7.8827	False
33	D	7.8827	False
34	D	7.8827	False
35	D	7.8827	False
36	D	7.8827	False
37	D	7.8827	False
38	D	7.8827	False
39	D	7.8827	False
40	D	7.8827	False
41	D	7.8827	False
42	D	7.8827	False
43	D	7.8827	False
44	D	7.8827	False
45	D	7.8827	False
46	D	7.8827	False
47	D	7.8827	False
48	D	7.8827	False
49	D	7.8827	False
50	D	7.8827	False
51	D	7.8827	False
52	D	7.8827	False
53	D	7.8827	False
54	D	7.8827	False
55	D	7.8827	False
56	D	7.8827	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
57	D	7.8827	False
58	D	7.8827	False
59	D	7.8827	False
60	D	7.8827	False
61	D	7.8827	False
62	D	7.8827	False
63	D	7.8827	False
64	D	7.8827	False
65	D	7.8827	False
66	D	7.8827	False
67	D	7.8827	False
68	D	7.8827	False
69	D	7.8827	False
70	D	7.8827	False
71	D	7.8827	False
72	D	7.8827	False
73	D	7.8827	False
74	D	7.8827	False
75	D	7.8827	False
76	D	7.8827	False
77	D	7.8827	False
78	D	7.8827	False
79	D	7.8827	False
80	D	7.8827	False
81	D	7.8827	False
82	D	7.8827	False
83	D	7.8827	False
84	D	7.8827	False
85	D	7.8827	False
86	D	7.8827	False
87	D	7.8827	False
88	D	7.8827	False
89	D	7.8827	False
90	D	7.8827	False
91	D	7.8827	False
92	D	7.8827	False
93	D	7.8827	False
94	D	7.8827	False
95	D	7.8827	False
96	D	7.8827	False
97	D	7.8827	False
98	D	7.8827	False
99	D	7.8827	False
100	D	7.8827	False

C.3.10 stochastic_drift_results_GSHS_E.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	E	8.1633	False
2	E	8.9249	False
3	E	8.4208	False
4	E	8.1599	False
5	E	8.1507	False
6	E	9.5591	False
7	E	12.3235	False
8	E	7.8938	False
9	E	8.1029	False
10	E	17.7138	False
11	E	9.82	False
12	E	8.7473	False
13	E	8.4489	False
14	E	9.4665	False
15	E	29.8161	False
16	E	8.4287	False
17	E	9.2326	False
18	E	8.995	False
19	E	9.8451	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
20	E	9.0898	False
21	E	8.1414	False
22	E	8.2703	False
23	E	8.7271	False
24	E	8.6817	False
25	E	8.1632	False
26	E	9.4171	False
27	E	13.3085	False
28	E	11.7966	False
29	E	8.3306	False
30	E	11.3215	False
31	E	8.6474	False
32	E	8.0457	False
33	E	10.0178	False
34	E	8.2476	False
35	E	9.5505	False
36	E	8.2987	False
37	E	9.0536	False
38	E	8.0293	False
39	E	8.9613	False
40	E	10.0039	False
41	E	8.2626	False
42	E	8.8482	False
43	E	8.2479	False
44	E	8.7542	False
45	E	9.2305	False
46	E	8.4546	False
47	E	15.6173	False
48	E	7.9691	False
49	E	9.5754	False
50	E	10.5544	False
51	E	9.437	False
52	E	8.6314	False
53	E	12.4234	False
54	E	9.0441	False
55	E	8.3491	False
56	E	8.2687	False
57	E	8.2563	False
58	E	8.9868	False
59	E	8.5644	False
60	E	8.1143	False
61	E	8.195	False
62	E	9.5398	False
63	E	8.857	False
64	E	9.2112	False
65	E	8.2891	False
66	E	8.4766	False
67	E	9.3393	False
68	E	9.5432	False
69	E	9.4539	False
70	E	8.4549	False
71	E	8.6464	False
72	E	8.3228	False
73	E	8.8117	False
74	E	9.3453	False
75	E	9.7379	False
76	E	10.2391	False
77	E	8.4586	False
78	E	9.1297	False
79	E	11.9981	False
80	E	12.9146	False
81	E	9.1264	False
82	E	21.3147	False
83	E	8.1171	False
84	E	8.0751	False
85	E	8.0987	False
86	E	9.0002	False
87	E	9.6164	False
88	E	9.3584	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
89	E	8.2285	False
90	E	8.5875	False
91	E	7.9654	False
92	E	8.7865	False
93	E	8.7918	False
94	E	8.146	False
95	E	10.1781	False
96	E	9.4582	False
97	E	9.1162	False
98	E	8.5487	False
99	E	9.3661	False
100	E	8.3545	False

C.3.11 stochastic_drift_results_GS_A.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	A	0.934	False
2	A	0.9944	False
3	A	1.1038	False
4	A	0.9917	False
5	A	0.9855	False
6	A	1.0012	False
7	A	1.0349	False
8	A	1.2605	False
9	A	1.1364	False
10	A	0.9713	False
11	A	0.9842	False
12	A	1.0117	False
13	A	0.981	False
14	A	0.9874	False
15	A	1.0118	False
16	A	1.0881	False
17	A	1.0382	False
18	A	0.9793	False
19	A	0.9799	False
20	A	1.1767	False
21	A	0.9933	False
22	A	1.0492	False
23	A	1.1693	False
24	A	0.9933	False
25	A	1.0003	False
26	A	1.2809	False
27	A	0.9863	False
28	A	1.019	False
29	A	1.1228	False
30	A	1.043	False
31	A	1.079	False
32	A	0.9829	False
33	A	1.0051	False
34	A	0.9608	False
35	A	1.011	False
36	A	0.9995	False
37	A	1.1125	False
38	A	1.1823	False
39	A	0.993	False
40	A	1.0023	False
41	A	1.0087	False
42	A	1.119	False
43	A	0.9563	False
44	A	1.2881	False
45	A	1.0091	False
46	A	0.9942	False
47	A	0.988	False
48	A	1.0096	False
49	A	1.5536	False
50	A	0.9899	False
51	A	1.1255	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
52	A	1.0179	False
53	A	1.0022	False
54	A	1.3471	False
55	A	0.9828	False
56	A	1.3113	False
57	A	1.0038	False
58	A	1.0026	False
59	A	0.9983	False
60	A	1.0653	False
61	A	0.9936	False
62	A	1.0403	False
63	A	0.9845	False
64	A	1.1797	False
65	A	1.2095	False
66	A	1.0427	False
67	A	1.0541	False
68	A	1.0028	False
69	A	1.0235	False
70	A	0.9855	False
71	A	0.9903	False
72	A	1.034	False
73	A	1.0686	False
74	A	0.9804	False
75	A	1.003	False
76	A	1.399	False
77	A	1.0069	False
78	A	0.9974	False
79	A	1.0198	False
80	A	1.01	False
81	A	1.0011	False
82	A	1.3265	False
83	A	0.9995	False
84	A	0.9786	False
85	A	1.0028	False
86	A	1.1697	False
87	A	0.9743	False
88	A	1.103	False
89	A	1.0784	False
90	A	0.9818	False
91	A	1.0095	False
92	A	0.9891	False
93	A	0.8933	False
94	A	1.0049	False
95	A	0.993	False
96	A	1.41	False
97	A	1.2124	False
98	A	1.0809	False
99	A	1.0896	False
100	A	1.0809	False

C.3.12 stochastic_drift_results_GS_B.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	B	1.6596	False
2	B	1.4318	False
3	B	1.0284	False
4	B	1.1454	False
5	B	1.0219	False
6	B	1.0476	False
7	B	1.0285	False
8	B	1.0286	False
9	B	1.0596	False
10	B	1.0592	False
11	B	1.0168	False
12	B	1.1015	False
13	B	1.1529	False
14	B	1.031	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
15	B	1.0522	False
16	B	1.3435	False
17	B	1.0379	False
18	B	1.1017	False
19	B	1.2713	False
20	B	2.0616	False
21	B	1.8801	False
22	B	1.0338	False
23	B	1.1456	False
24	B	1.0307	False
25	B	1.4215	False
26	B	1.023	False
27	B	1.042	False
28	B	1.0543	False
29	B	1.92	False
30	B	1.3046	False
31	B	1.0625	False
32	B	1.0417	False
33	B	1.4657	False
34	B	1.159	False
35	B	1.1707	False
36	B	1.0467	False
37	B	1.0644	False
38	B	1.0356	False
39	B	1.0367	False
40	B	1.0871	False
41	B	1.1992	False
42	B	1.0849	False
43	B	1.0282	False
44	B	1.0528	False
45	B	1.032	False
46	B	1.0368	False
47	B	1.0248	False
48	B	1.6244	False
49	B	1.4788	False
50	B	1.1338	False
51	B	1.0476	False
52	B	1.0253	False
53	B	1.0228	False
54	B	1.0328	False
55	B	1.0689	False
56	B	1.041	False
57	B	1.0394	False
58	B	1.0982	False
59	B	1.069	False
60	B	1.0162	False
61	B	1.0085	False
62	B	1.0224	False
63	B	1.0246	False
64	B	1.0921	False
65	B	1.0216	False
66	B	1.0617	False
67	B	1.1041	False
68	B	1.0354	False
69	B	1.1552	False
70	B	1.2162	False
71	B	1.3587	False
72	B	1.0208	False
73	B	1.0258	False
74	B	1.0443	False
75	B	1.0199	False
76	B	1.0337	False
77	B	1.056	False
78	B	1.413	False
79	B	1.0394	False
80	B	1.0225	False
81	B	1.03	False
82	B	1.3538	False
83	B	1.0409	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
84	B	1.0364	False
85	B	1.0189	False
86	B	1.1594	False
87	B	1.0874	False
88	B	1.1367	False
89	B	1.0331	False
90	B	1.0258	False
91	B	1.0374	False
92	B	1.0334	False
93	B	1.024	False
94	B	1.1069	False
95	B	1.025	False
96	B	1.0437	False
97	B	1.2573	False
98	B	1.0187	False
99	B	1.0254	False
100	B	1.0268	False

C.3.13 stochastic_drift_results_GS_C.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	C	1.0723	False
2	C	1.0003	False
3	C	1.0214	False
4	C	1.0003	False
5	C	1.0047	False
6	C	1.0003	False
7	C	1.0166	False
8	C	1.0003	False
9	C	1.0003	False
10	C	1.2141	False
11	C	1.0887	False
12	C	1.0003	False
13	C	1.5697	False
14	C	1.0467	False
15	C	1.0003	False
16	C	1.0003	False
17	C	1.0003	False
18	C	1.0003	False
19	C	1.0003	False
20	C	1.0124	False
21	C	1.0003	False
22	C	1.1859	False
23	C	1.0003	False
24	C	1.0891	False
25	C	1.0609	False
26	C	1.0003	False
27	C	1.0003	False
28	C	1.0003	False
29	C	1.0003	False
30	C	1.0003	False
31	C	1.0003	False
32	C	1.0355	False
33	C	1.0391	False
34	C	1.0003	False
35	C	1.0501	False
36	C	1.0346	False
37	C	1.1417	False
38	C	1.0003	False
39	C	1.0657	False
40	C	1.0168	False
41	C	1.4448	False
42	C	1.1825	False
43	C	1.0003	False
44	C	1.0003	False
45	C	1.0003	False
46	C	1.0383	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
47	C	1.0003	False
48	C	1.0027	False
49	C	1.0186	False
50	C	1.0003	False
51	C	1.0585	False
52	C	1.0003	False
53	C	1.0003	False
54	C	1.0003	False
55	C	1.2186	False
56	C	1.1139	False
57	C	1.1205	False
58	C	1.0506	False
59	C	1.0003	False
60	C	1.0647	False
61	C	1.0578	False
62	C	1.0003	False
63	C	1.006	False
64	C	1.0003	False
65	C	1.0754	False
66	C	1.0227	False
67	C	1.1292	False
68	C	1.0003	False
69	C	1.0003	False
70	C	1.0038	False
71	C	1.0707	False
72	C	1.0003	False
73	C	1.1158	False
74	C	1.0141	False
75	C	1.012	False
76	C	1.0222	False
77	C	1.0479	False
78	C	1.0003	False
79	C	1.0003	False
80	C	1.1294	False
81	C	1.0003	False
82	C	1.0003	False
83	C	1.0254	False
84	C	1.0239	False
85	C	1.0455	False
86	C	1.0003	False
87	C	1.0235	False
88	C	1.0003	False
89	C	1.0799	False
90	C	1.0003	False
91	C	1.0003	False
92	C	1.0003	False
93	C	1.1297	False
94	C	1.0003	False
95	C	1.0003	False
96	C	1.0003	False
97	C	1.0567	False
98	C	1.1728	False
99	C	1.0837	False
100	C	1.0003	False

C.3.14 stochastic_drift_results_GS_E.csv

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
1	E	1.0023	False
2	E	1.1634	False
3	E	1.1282	False
4	E	1.1761	False
5	E	1.1441	False
6	E	1.0029	False
7	E	1.1305	False
8	E	1.0871	False
9	E	1.1365	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
10	E	1.203	False
11	E	1.0419	False
12	E	0.9972	False
13	E	1.0317	False
14	E	1.0334	False
15	E	1.0628	False
16	E	1.1153	False
17	E	1.195	False
18	E	1.0578	False
19	E	1.2455	False
20	E	1.0053	False
21	E	1.0604	False
22	E	1.1024	False
23	E	1.2006	False
24	E	1.0836	False
25	E	1.1573	False
26	E	1.0541	False
27	E	1.1492	False
28	E	1.2036	False
29	E	1.1178	False
30	E	2.0094	False
31	E	1.0954	False
32	E	1.726	False
33	E	1.0099	False
34	E	1.0509	False
35	E	1.032	False
36	E	1.3611	False
37	E	1.0046	False
38	E	1.0919	False
39	E	1.0333	False
40	E	1.0938	False
41	E	1.2295	False
42	E	2.1156	False
43	E	1.0263	False
44	E	1.6719	False
45	E	1.1477	False
46	E	1.343	False
47	E	1.4553	False
48	E	1.2913	False
49	E	1.0338	False
50	E	1.3212	False
51	E	1.0628	False
52	E	1.1237	False
53	E	1.2728	False
54	E	1.3043	False
55	E	1.0699	False
56	E	1.14	False
57	E	1.0914	False
58	E	1.1123	False
59	E	1.0512	False
60	E	1.0231	False
61	E	1.6105	False
62	E	1.0209	False
63	E	1.5324	False
64	E	1.0425	False
65	E	1.0413	False
66	E	1.0247	False
67	E	1.039	False
68	E	1.3099	False
69	E	1.0236	False
70	E	2.8239	False
71	E	1.0333	False
72	E	1.1336	False
73	E	2.4275	False
74	E	1.2082	False
75	E	1.3905	False
76	E	1.5103	False
77	E	1.3773	False
78	E	1.0738	False

Iteration_ID	Scenario_ID	Delta_TOP_mm	Solver_Collapse_Flag
79	E	1.1846	False
80	E	1.8078	False
81	E	1.0449	False
82	E	1.0743	False
83	E	1.255	False
84	E	1.4174	False
85	E	1.1723	False
86	E	1.5154	False
87	E	1.0676	False
88	E	0.8733	False
89	E	1.0817	False
90	E	1.1699	False
91	E	1.1858	False
92	E	1.0993	False
93	E	1.0553	False
94	E	1.1246	False
95	E	1.1104	False
96	E	1.1276	False
97	E	1.1337	False
98	E	1.9068	False
99	E	1.1679	False
100	E	1.1278	False

C.3.15 stochastic_traceability_log_GHS_A.csv

Iteration_ID	Hazard_Zone	Component_ID	Applied_EX_MPa	Applied_ke_N_mm	Damage_Factor_D	Dynamic_MA_T_ID	Dynamic_REA_L_ID
1	A	G_C1_L0	8592.49	239.315	0.9239	101	101
1	A	G_C2_L0	9058.1	252.283	0.974	102	102
1	A	G_C0_L21	6047.22	168.425	0.6502	103	103
1	A	G_C0_L0	8759.33	243.961	0.9419	104	104
2	A	G_C2_L21	5875.52	163.643	0.6318	105	105
2	A	G_C1_L0	8699.75	242.302	0.9355	106	106
3	A	G_C0_L0	5399.41	150.382	0.5806	107	107
3	A	G_C2_L0	5203.53	144.927	0.5595	108	108
3	A	G_C1_L0	5119.5	142.586	0.5505	109	109
4	A	G_C1_L0	388.148	10.8106	0.0417	110	110
4	A	G_C0_L0	4877.15	135.836	0.5244	111	111
5	A	G_C0_L0	7521.07	209.474	0.8087	112	112
5	A	G_C2_L0	5241.08	145.972	0.5636	113	113
5	A	G_C2_L21	7834.72	218.209	0.8424	114	114
6	A	G_C0_L0	7402.3	206.166	0.7959	115	115
6	A	G_C2_L21	6160.54	171.581	0.6624	116	116
6	A	G_C1_L21	8240.76	229.518	0.8861	117	117
6	A	G_C0_L21	5633.71	156.908	0.6058	118	118
7	A	G_C0_L21	8442.84	235.147	0.9078	119	119
7	A	G_C1_L0	7171.25	199.731	0.7711	120	120
7	A	G_C2_L21	6464.08	180.035	0.6951	121	121
7	A	G_C1_L21	6200.68	172.699	0.6667	122	122
8	A	G_C1_L21	8842.89	246.289	0.9508	123	123
8	A	G_C2_L0	5596.41	155.869	0.6018	124	124
9	A	G_C2_L21	4904.97	136.611	0.5274	125	125
9	A	G_C2_L0	2768.16	77.0977	0.2977	126	126
9	A	G_C1_L0	4340.04	120.877	0.4667	127	127
10	A	G_C0_L0	5310.58	147.908	0.571	128	128
10	A	G_C1_L0	3386.09	94.308	0.3641	129	129
10	A	G_C2_L0	5978.83	166.52	0.6429	130	130
10	A	G_C0_L21	9177.39	255.605	0.9868	131	131
11	A	G_C2_L21	7097.02	197.663	0.7631	132	132
11	A	G_C0_L21	5258.99	146.471	0.5655	133	133
11	A	G_C1_L21	6885.31	191.767	0.7404	134	134
12	A	G_C0_L0	8057.9	224.425	0.8664	135	135
12	A	G_C0_L21	8520.52	237.31	0.9162	136	136
13	A	G_C2_L21	9186.06	255.847	0.9877	137	137
13	A	G_C0_L21	6540.46	182.162	0.7033	138	138
13	A	G_C0_L0	4786.98	133.325	0.5147	139	139
14	A	G_C1_L21	8724.59	242.994	0.9381	140	140

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
14	A	G_C2_L21	5542.96	154.38	0.596	141	141
14	A	G_C2_L0	9058.99	252.308	0.9741	142	142
15	A	G_C2_L0	6455.1	179.785	0.6941	143	143
15	A	G_C1_L0	5341.33	148.765	0.5743	144	144
16	A	G_C2_L21	2451.27	68.2719	0.2636	145	145
16	A	G_C1_L21	7052.72	196.429	0.7584	146	146
17	A	G_C2_L21	8820.27	245.659	0.9484	147	147
17	A	G_C1_L21	5166.88	143.906	0.5556	148	148
17	A	G_C1_L0	8938.34	248.947	0.9611	149	149
17	A	G_C0_L0	7980.76	222.277	0.8581	150	150
18	A	G_C0_L0	3920.36	109.189	0.4215	151	151
18	A	G_C1_L21	4903.39	136.567	0.5272	152	152
18	A	G_C2_L21	7158.83	199.385	0.7698	153	153
18	A	G_C2_L0	4799.09	133.662	0.516	154	154
19	A	G_C1_L0	3488.79	97.1684	0.3751	155	155
19	A	G_C0_L0	7504.1	209.001	0.8069	156	156
20	A	G_C0_L21	8381.71	233.444	0.9013	157	157
20	A	G_C1_L21	7808.72	217.486	0.8396	158	158
20	A	G_C2_L21	7517.98	209.388	0.8084	159	159
21	A	G_C0_L21	8627.95	240.302	0.9277	160	160
21	A	G_C1_L0	7838.11	218.304	0.8428	161	161
21	A	G_C2_L21	7324.27	203.993	0.7876	162	162
22	A	G_C2_L0	7980.58	222.272	0.8581	163	163
22	A	G_C1_L0	8926.65	248.622	0.9599	164	164
22	A	G_C2_L21	9062.62	252.409	0.9745	165	165
22	A	G_C0_L0	4455.07	124.081	0.479	166	166
23	A	G_C1_L0	4919.69	137.021	0.529	167	167
23	A	G_C2_L21	5058.07	140.875	0.5439	168	168
23	A	G_C0_L0	6544.43	182.273	0.7037	169	169
23	A	G_C1_L21	6905.2	192.321	0.7425	170	170
24	A	G_C0_L21	8435.54	234.943	0.907	171	171
24	A	G_C1_L0	7996.83	222.725	0.8599	172	172
24	A	G_C0_L0	7656.94	213.258	0.8233	173	173
24	A	G_C2_L21	7414.66	206.51	0.7973	174	174
25	A	G_C2_L21	4451.42	123.979	0.4786	175	175
25	A	G_C2_L0	9161.48	255.162	0.9851	176	176
25	A	G_C0_L21	7708.9	214.705	0.8289	177	177
26	A	G_C2_L0	5851.94	162.986	0.6292	178	178
26	A	G_C1_L21	8913.47	248.254	0.9584	179	179
26	A	G_C1_L0	8888.91	247.571	0.9558	180	180
26	A	G_C0_L0	7027.56	195.729	0.7557	181	181
27	A	G_C2_L0	8303.63	231.269	0.8929	182	182
27	A	G_C1_L21	7179.94	199.973	0.772	183	183
28	A	G_C0_L21	7338.97	204.402	0.7891	184	184
28	A	G_C2_L0	6885.64	191.776	0.7404	185	185
28	A	G_C1_L0	7518.45	209.401	0.8084	186	186
29	A	G_C0_L21	8943.07	249.079	0.9616	187	187
29	A	G_C1_L0	7103.32	197.839	0.7638	188	188
29	A	G_C2_L0	8105.51	225.751	0.8716	189	189
29	A	G_C2_L21	8024.3	223.49	0.8628	190	190
30	A	G_C2_L0	4585.63	127.717	0.4931	191	191
30	A	G_C0_L21	7734.4	215.416	0.8317	192	192
30	A	G_C2_L21	1416.93	39.4639	0.1524	193	193
31	A	G_C0_L0	8587.91	239.187	0.9234	194	194
31	A	G_C0_L21	3555.06	99.0143	0.3823	195	195
31	A	G_C2_L0	8008.65	223.054	0.8611	196	196
31	A	G_C1_L0	2857.2	79.5777	0.3072	197	197
32	A	G_C2_L0	5672.34	157.984	0.6099	198	198
32	A	G_C0_L21	8237.58	229.43	0.8858	199	199
32	A	G_C1_L0	3004.25	83.6731	0.323	200	200
33	A	G_C1_L0	6584.43	183.387	0.708	201	201
33	A	G_C0_L21	8374.01	233.23	0.9004	202	202
33	A	G_C2_L0	3508.41	97.7148	0.3772	203	203
34	A	G_C1_L21	7000.31	194.97	0.7527	204	204
34	A	G_C1_L0	7840.03	218.358	0.843	205	205
34	A	G_C0_L21	6555.5	182.581	0.7049	206	206
35	A	G_C1_L0	8072.88	224.843	0.8681	207	207
35	A	G_C2_L0	8847.73	246.424	0.9514	208	208

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
35	A	G_C1_L21	8122.56	226.226	0.8734	209	209
36	A	G_C1_L21	4258.96	118.619	0.458	210	210
36	A	G_C2_L0	6236.32	173.691	0.6706	211	211
36	A	G_C0_L0	7081.15	197.221	0.7614	212	212
37	A	G_C2_L21	904.673	25.1966	0.0973	213	213
37	A	G_C0_L0	7298.36	203.271	0.7848	214	214
37	A	G_C0_L21	8195.71	228.264	0.8813	215	215
37	A	G_C1_L21	4108.58	114.431	0.4418	216	216
38	A	G_C1_L0	8978.38	250.062	0.9654	217	217
38	A	G_C1_L21	6606.83	184.011	0.7104	218	218
38	A	G_C2_L0	7271.07	202.511	0.7818	219	219
38	A	G_C0_L0	4245.87	118.254	0.4565	220	220
39	A	G_C0_L21	7675.03	213.762	0.8253	221	221
39	A	G_C1_L21	8580.15	238.971	0.9226	222	222
39	A	G_C2_L21	5943.73	165.542	0.6391	223	223
39	A	G_C2_L0	8624.8	240.214	0.9274	224	224
40	A	G_C0_L21	6657.47	185.421	0.7159	225	225
40	A	G_C2_L0	8114.01	225.988	0.8725	226	226
41	A	G_C2_L0	6742.71	187.795	0.725	227	227
41	A	G_C1_L0	7500.68	208.906	0.8065	228	228
42	A	G_C0_L0	8695.14	242.174	0.935	229	229
42	A	G_C2_L21	6057.3	168.706	0.6513	230	230
43	A	G_C1_L21	8532.16	237.635	0.9174	231	231
43	A	G_C1_L0	5107.55	142.253	0.5492	232	232
44	A	G_C0_L0	4906.48	136.654	0.5276	233	233
44	A	G_C0_L21	5829.09	162.35	0.6268	234	234
44	A	G_C2_L21	6741.65	187.766	0.7249	235	235
45	A	G_C2_L0	5983.3	166.645	0.6434	236	236
45	A	G_C0_L21	7755.24	215.996	0.8339	237	237
46	A	G_C2_L21	7260.85	202.226	0.7807	238	238
46	A	G_C1_L21	7976.26	222.152	0.8577	239	239
46	A	G_C2_L0	8303	231.252	0.8928	240	240
46	A	G_C0_L0	8157.5	227.2	0.8772	241	241
47	A	G_C2_L21	2726.91	75.9488	0.2932	242	242
47	A	G_C1_L21	8479.61	236.171	0.9118	243	243
48	A	G_C0_L21	6908.36	192.409	0.7428	244	244
48	A	G_C0_L0	6205	172.819	0.6672	245	245
48	A	G_C2_L0	7575.84	210.999	0.8146	246	246
48	A	G_C2_L21	6971.82	194.176	0.7497	247	247
49	A	G_C0_L0	5455.35	151.94	0.5866	248	248
49	A	G_C1_L0	8719.78	242.86	0.9376	249	249
50	A	G_C1_L21	4495.56	125.209	0.4834	250	250
50	A	G_C2_L21	6577.39	183.191	0.7072	251	251
51	A	G_C1_L21	6741.39	187.759	0.7249	252	252
51	A	G_C0_L0	5730.98	159.617	0.6162	253	253
52	A	G_C1_L21	7674.8	213.756	0.8252	254	254
52	A	G_C0_L21	7767.23	216.33	0.8352	255	255
53	A	G_C0_L0	4410.74	122.846	0.4743	256	256
53	A	G_C1_L21	4619.81	128.669	0.4968	257	257
53	A	G_C1_L0	5194.87	144.685	0.5586	258	258
53	A	G_C2_L0	8905.6	248.035	0.9576	259	259
54	A	G_C0_L21	5980.49	166.566	0.6431	260	260
54	A	G_C1_L0	7776.84	216.598	0.8362	261	261
55	A	G_C1_L0	7576.91	211.029	0.8147	262	262
55	A	G_C0_L21	2949.02	82.1349	0.3171	263	263
55	A	G_C2_L21	6192.03	172.458	0.6658	264	264
56	A	G_C0_L21	6998.81	194.928	0.7526	265	265
56	A	G_C1_L21	6174.31	171.965	0.6639	266	266
56	A	G_C2_L0	8638.23	240.589	0.9288	267	267
57	A	G_C0_L0	8225.62	229.097	0.8845	268	268
57	A	G_C2_L0	3769.33	104.982	0.4053	269	269
58	A	G_C0_L0	6587.69	183.478	0.7084	270	270
58	A	G_C1_L0	8724.18	242.982	0.9381	271	271
59	A	G_C1_L21	6907.16	192.375	0.7427	272	272
59	A	G_C0_L21	8737	243.34	0.9395	273	273
59	A	G_C0_L0	7175.67	199.854	0.7716	274	274
59	A	G_C1_L0	3949.55	110.001	0.4247	275	275
60	A	G_C2_L0	9179.73	255.67	0.9871	276	276

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
60	A	G_C0_L21	8110.67	225.895	0.8721	277	277
60	A	G_C1_L0	7069.64	196.901	0.7602	278	278
61	A	G_C1_L0	6381.08	177.723	0.6861	279	279
61	A	G_C1_L21	4784.69	133.261	0.5145	280	280
61	A	G_C0_L21	6698.33	186.559	0.7203	281	281
62	A	G_C1_L0	8236.59	229.402	0.8857	282	282
62	A	G_C0_L0	4830.93	134.549	0.5195	283	283
62	A	G_C2_L21	7651.25	213.1	0.8227	284	284
63	A	G_C2_L21	7413.64	206.482	0.7972	285	285
63	A	G_C1_L21	4121.44	114.789	0.4432	286	286
63	A	G_C1_L0	6401.16	178.283	0.6883	287	287
63	A	G_C2_L0	5263.03	146.584	0.5659	288	288
64	A	G_C1_L0	5081.02	141.515	0.5463	289	289
64	A	G_C1_L21	7736.44	215.472	0.8319	290	290
64	A	G_C2_L21	6089.11	169.592	0.6547	291	291
65	A	G_C2_L21	8092.21	225.381	0.8701	292	292
65	A	G_C0_L21	7814.41	217.644	0.8403	293	293
65	A	G_C0_L0	8791.16	244.848	0.9453	294	294
65	A	G_C1_L21	8571.79	238.738	0.9217	295	295
66	A	G_C0_L21	3956.03	110.182	0.4254	296	296
66	A	G_C2_L0	8033.83	223.755	0.8639	297	297
66	A	G_C1_L21	3451.52	96.1304	0.3711	298	298
67	A	G_C2_L21	3883.62	108.165	0.4176	299	299
67	A	G_C1_L0	5705.51	158.907	0.6135	300	300
67	A	G_C1_L21	7291.85	203.09	0.7841	301	301
68	A	G_C0_L0	3683.25	102.585	0.396	302	302
68	A	G_C1_L21	9070.27	252.622	0.9753	303	303
68	A	G_C0_L21	3893.55	108.442	0.4187	304	304
68	A	G_C2_L21	9074.98	252.753	0.9758	305	305
69	A	G_C2_L21	5664.47	157.765	0.6091	306	306
69	A	G_C1_L0	6400.49	178.264	0.6882	307	307
69	A	G_C2_L0	8064.65	224.613	0.8672	308	308
70	A	G_C1_L0	3239.92	90.2371	0.3484	309	309
70	A	G_C0_L21	9216.01	256.681	0.991	310	310
70	A	G_C1_L21	7277.73	202.696	0.7826	311	311
70	A	G_C2_L0	7038.91	196.045	0.7569	312	312
71	A	G_C2_L21	7814.98	217.66	0.8403	313	313
71	A	G_C1_L21	5347.35	148.932	0.575	314	314
71	A	G_C1_L0	7355.19	204.854	0.7909	315	315
72	A	G_C2_L21	8005.64	222.97	0.8608	316	316
72	A	G_C0_L0	8964.76	249.683	0.964	317	317
73	A	G_C1_L0	6723.43	187.258	0.7229	318	318
73	A	G_C2_L21	6904.92	192.313	0.7425	319	319
73	A	G_C0_L0	5854.71	163.063	0.6295	320	320
73	A	G_C0_L21	7097.57	197.679	0.7632	321	321
74	A	G_C2_L21	7562	210.614	0.8131	322	322
74	A	G_C1_L0	8043.76	224.032	0.8649	323	323
75	A	G_C0_L21	5922.78	164.959	0.6369	324	324
75	A	G_C2_L21	6425.14	178.951	0.6909	325	325
75	A	G_C0_L0	4458.41	124.174	0.4794	326	326
76	A	G_C2_L0	9228.36	257.025	0.9923	327	327
76	A	G_C1_L21	7320.58	203.89	0.7872	328	328
77	A	G_C1_L0	6426.38	178.985	0.691	329	329
77	A	G_C2_L21	5573.12	155.22	0.5993	330	330
77	A	G_C2_L0	5441.57	151.557	0.5851	331	331
77	A	G_C1_L21	8615.04	239.943	0.9263	332	332
78	A	G_C1_L21	5473.21	152.438	0.5885	333	333
78	A	G_C1_L0	7677.38	213.827	0.8255	334	334
79	A	G_C2_L0	8506.11	236.909	0.9146	335	335
79	A	G_C1_L0	7510.69	209.185	0.8076	336	336
79	A	G_C1_L21	6664.33	185.612	0.7166	337	337
79	A	G_C0_L21	2188.12	60.9427	0.2353	338	338
80	A	G_C1_L21	4693.99	130.735	0.5047	339	339
80	A	G_C1_L0	5414.55	150.804	0.5822	340	340
80	A	G_C2_L21	8082.5	225.111	0.8691	341	341
81	A	G_C0_L21	7988.64	222.497	0.859	342	342
81	A	G_C1_L0	7691.99	214.234	0.8271	343	343
82	A	G_C2_L21	6613.29	184.191	0.7111	344	344

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
82	A	G_C1_L21	3217.29	89.6066	0.3459	345	345
82	A	G_C0_L0	5418	150.9	0.5826	346	346
82	A	G_C1_L0	9053.3	252.149	0.9735	347	347
83	A	G_C1_L21	5486.97	152.821	0.59	348	348
83	A	G_C2_L0	5709.78	159.027	0.614	349	349
84	A	G_C2_L0	5296.16	147.507	0.5695	350	350
84	A	G_C0_L21	6564.95	182.844	0.7059	351	351
85	A	G_C2_L0	8078.29	224.993	0.8686	352	352
85	A	G_C0_L21	6458.45	179.878	0.6945	353	353
85	A	G_C1_L21	7036.11	195.967	0.7566	354	354
85	A	G_C2_L21	2366.41	65.9083	0.2545	355	355
86	A	G_C2_L21	5777.85	160.923	0.6213	356	356
86	A	G_C1_L21	3860.98	107.534	0.4152	357	357
86	A	G_C2_L0	6186.64	172.308	0.6652	358	358
86	A	G_C1_L0	4690.58	130.64	0.5044	359	359
87	A	G_C0_L21	4742.64	132.09	0.51	360	360
87	A	G_C2_L21	8157.54	227.201	0.8772	361	361
88	A	G_C1_L0	3385.35	94.2873	0.364	362	362
88	A	G_C0_L21	4405.29	122.695	0.4737	363	363
88	A	G_C2_L21	29.3198	0.8166	0.0032	364	364
89	A	G_C2_L21	7229.6	201.356	0.7774	365	365
89	A	G_C1_L21	6708.15	186.833	0.7213	366	366
90	A	G_C0_L21	6875.49	191.494	0.7393	367	367
90	A	G_C0_L0	7502.16	208.947	0.8067	368	368
91	A	G_C1_L21	8032.64	223.722	0.8637	369	369
91	A	G_C0_L21	8484.98	236.32	0.9124	370	370
91	A	G_C2_L0	1626.82	45.3094	0.1749	371	371
91	A	G_C1_L0	8579.38	238.95	0.9225	372	372
92	A	G_C0_L21	5037.81	140.311	0.5417	373	373
92	A	G_C2_L21	7104.03	197.859	0.7639	374	374
92	A	G_C2_L0	7843.32	218.449	0.8434	375	375
92	A	G_C1_L21	8239.17	229.474	0.8859	376	376
93	A	G_C0_L21	5317.64	148.105	0.5718	377	377
93	A	G_C2_L21	3085.52	85.9366	0.3318	378	378
93	A	G_C1_L0	8630.46	240.372	0.928	379	379
93	A	G_C2_L0	6595.29	183.69	0.7092	380	380
94	A	G_C1_L0	7691.27	214.214	0.827	381	381
94	A	G_C2_L21	6245.57	173.949	0.6716	382	382
95	A	G_C1_L0	5533.75	154.124	0.595	383	383
95	A	G_C2_L0	7508.95	209.136	0.8074	384	384
95	A	G_C2_L21	4981.31	138.738	0.5356	385	385
95	A	G_C1_L21	5356.36	149.183	0.576	386	386
96	A	G_C0_L0	4780.97	133.158	0.5141	387	387
96	A	G_C0_L21	6228.51	173.474	0.6697	388	388
96	A	G_C1_L21	7063.93	196.742	0.7596	389	389
97	A	G_C2_L21	4365.35	121.582	0.4694	390	390
97	A	G_C2_L0	6996.01	194.85	0.7523	391	391
98	A	G_C1_L0	8908.16	248.107	0.9579	392	392
98	A	G_C0_L0	9185.89	255.842	0.9877	393	393
99	A	G_C1_L21	4016.29	111.86	0.4319	394	394
99	A	G_C0_L0	7727	215.209	0.8309	395	395
99	A	G_C2_L0	8289.8	230.884	0.8914	396	396
100	A	G_C1_L0	5674.6	158.047	0.6102	397	397
100	A	G_C1_L21	7759.61	216.118	0.8344	398	398
100	A	G_C2_L21	2696.61	75.1048	0.29	399	399

C.3.16 stochastic_traceability_log_GHS_B.csv

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
1	B	G_C0_L2	8086.68	225.227	0.8695	101	101
1	B	G_C1_L2	7089.92	197.466	0.7624	102	102
1	B	G_C2_L0	7943.34	221.235	0.8541	103	103
1	B	G_C2_L4	21.3614	0.595	0.0023	104	104
1	B	G_C1_L1	8939.65	248.984	0.9613	105	105
2	B	G_C2_L1	5296.4	147.513	0.5695	106	106

Iteration_I	Hazard_Zo	Component	Applied_EX	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	ID	MPa	_mm	r_D	T_ID	L_ID
2	B	G_C1_L0	7786.52	216.867	0.8373	107	107
2	B	G_C0_L0	8832.99	246.013	0.9498	108	108
2	B	G_C1_L3	8528.65	237.537	0.9171	109	109
2	B	G_C1_L1	7828.54	218.037	0.8418	110	110
2	B	G_C2_L3	8445.95	235.233	0.9082	111	111
2	B	G_C2_L4	5413.52	150.775	0.5821	112	112
2	B	G_C2_L2	2137.76	59.5399	0.2299	113	113
3	B	G_C0_L1	5921.81	164.932	0.6368	114	114
3	B	G_C1_L4	6578.88	183.232	0.7074	115	115
3	B	G_C2_L1	6232.58	173.588	0.6702	116	116
3	B	G_C2_L0	4965.79	138.305	0.534	117	117
3	B	G_C0_L4	8867.88	246.985	0.9535	118	118
3	B	G_C1_L2	7218.1	201.036	0.7761	119	119
3	B	G_C0_L0	5101.81	142.094	0.5486	120	120
3	B	G_C1_L1	7594.74	211.526	0.8166	121	121
4	B	G_C1_L4	7520.82	209.467	0.8087	122	122
4	B	G_C2_L0	8325.36	231.875	0.8952	123	123
4	B	G_C0_L0	3938.07	109.682	0.4234	124	124
4	B	G_C0_L3	7251.09	201.955	0.7797	125	125
4	B	G_C2_L4	4834.86	134.659	0.5199	126	126
4	B	G_C1_L0	7551.56	210.323	0.812	127	127
4	B	G_C1_L2	7379.19	205.522	0.7935	128	128
5	B	G_C1_L1	2796.65	77.8912	0.3007	129	129
5	B	G_C0_L3	4568.05	127.228	0.4912	130	130
5	B	G_C2_L3	7835.14	218.221	0.8425	131	131
5	B	G_C0_L2	9237.02	257.266	0.9932	132	132
5	B	G_C2_L4	8269.67	230.324	0.8892	133	133
5	B	G_C1_L2	8300.44	231.181	0.8925	134	134
5	B	G_C0_L1	4956.61	138.049	0.533	135	135
6	B	G_C2_L4	9130.41	254.297	0.9818	136	136
6	B	G_C1_L3	8291.9	230.943	0.8916	137	137
6	B	G_C2_L1	6574.49	183.11	0.7069	138	138
6	B	G_C2_L2	7330.98	204.18	0.7883	139	139
6	B	G_C1_L2	7478.48	208.288	0.8041	140	140
7	B	G_C1_L4	6797.3	189.316	0.7309	141	141
7	B	G_C0_L4	9132.2	254.346	0.982	142	142
7	B	G_C2_L0	6737.88	187.661	0.7245	143	143
7	B	G_C2_L4	2863.3	79.7474	0.3079	144	144
7	B	G_C1_L0	8031.21	223.682	0.8636	145	145
7	B	G_C1_L2	8197.5	228.314	0.8815	146	146
7	B	G_C0_L2	2842.17	79.159	0.3056	147	147
7	B	G_C0_L3	8871.32	247.081	0.9539	148	148
8	B	G_C2_L0	5917.32	164.807	0.6363	149	149
8	B	G_C1_L4	4272.31	118.991	0.4594	150	150
8	B	G_C1_L3	4131.45	115.067	0.4442	151	151
8	B	G_C0_L3	6565.34	182.855	0.706	152	152
8	B	G_C2_L2	8713.18	242.676	0.9369	153	153
8	B	G_C2_L1	7808.25	217.472	0.8396	154	154
8	B	G_C1_L2	8250.18	229.781	0.8871	155	155
8	B	G_C0_L2	6397.24	178.174	0.6879	156	156
8	B	G_C0_L0	8093.07	225.405	0.8702	157	157
9	B	G_C2_L4	1512	42.1117	0.1626	158	158
9	B	G_C1_L2	7180.57	199.991	0.7721	159	159
9	B	G_C1_L1	8697.53	242.24	0.9352	160	160
9	B	G_C0_L0	6195.42	172.553	0.6662	161	161
9	B	G_C1_L3	7082.41	197.257	0.7615	162	162
9	B	G_C0_L4	5858.6	163.172	0.63	163	163
9	B	G_C0_L3	6757.74	188.214	0.7266	164	164
9	B	G_C2_L1	6754.16	188.114	0.7263	165	165
9	B	G_C2_L2	7311.38	203.634	0.7862	166	166
10	B	G_C0_L3	7673.95	213.732	0.8252	167	167
10	B	G_C2_L4	4954.98	138.004	0.5328	168	168
10	B	G_C1_L3	7444.13	207.331	0.8004	169	169
10	B	G_C1_L4	3792.93	105.639	0.4078	170	170
10	B	G_C0_L0	8986.69	250.294	0.9663	171	171
10	B	G_C2_L3	8404.96	234.092	0.9038	172	172
10	B	G_C1_L1	6135.79	170.892	0.6598	173	173
10	B	G_C0_L4	5619.73	156.519	0.6043	174	174

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
11	B	G_C0_L2	8848.78	246.453	0.9515	175	175
11	B	G_C2_L1	9272.14	258.244	0.997	176	176
11	B	G_C2_L3	4787.33	133.335	0.5148	177	177
11	B	G_C2_L4	9221.12	256.823	0.9915	178	178
11	B	G_C1_L2	3656.93	101.852	0.3932	179	179
11	B	G_C1_L3	7061.72	196.68	0.7593	180	180
12	B	G_C1_L3	8261.43	230.094	0.8883	181	181
12	B	G_C2_L0	6923.28	192.824	0.7444	182	182
12	B	G_C0_L2	5726.48	159.492	0.6158	183	183
12	B	G_C0_L0	8899.86	247.876	0.957	184	184
12	B	G_C1_L2	5878.42	163.724	0.6321	185	185
12	B	G_C2_L1	6025.4	167.817	0.6479	186	186
12	B	G_C2_L3	5799.08	161.514	0.6236	187	187
12	B	G_C0_L1	6021.27	167.702	0.6474	188	188
12	B	G_C2_L2	4595.38	127.989	0.4941	189	189
13	B	G_C2_L4	5111.26	142.357	0.5496	190	190
13	B	G_C0_L2	7257.66	202.137	0.7804	191	191
13	B	G_C1_L0	5947.57	165.649	0.6395	192	192
13	B	G_C2_L3	7842.14	218.416	0.8432	193	193
13	B	G_C1_L4	8401.71	234.001	0.9034	194	194
13	B	G_C1_L2	7479.93	208.328	0.8043	195	195
13	B	G_C0_L3	7055.2	196.499	0.7586	196	196
13	B	G_C2_L2	1145.15	31.8942	0.1231	197	197
14	B	G_C0_L3	4285.6	119.361	0.4608	198	198
14	B	G_C1_L4	2944.14	81.9991	0.3166	199	199
14	B	G_C0_L2	8097.21	225.52	0.8707	200	200
14	B	G_C2_L2	52.1835	1.4534	0.0056	201	201
14	B	G_C2_L1	5635.97	156.971	0.606	202	202
14	B	G_C2_L3	7476.68	208.238	0.8039	203	203
14	B	G_C1_L1	9182.65	255.752	0.9874	204	204
14	B	G_C1_L3	4458.8	124.185	0.4794	205	205
14	B	G_C2_L0	7023.86	195.626	0.7553	206	206
15	B	G_C1_L3	8900.3	247.888	0.957	207	207
15	B	G_C2_L3	8787.65	244.75	0.9449	208	208
15	B	G_C2_L0	7270.04	202.482	0.7817	209	209
15	B	G_C0_L4	6580.8	183.286	0.7076	210	210
15	B	G_C1_L1	8962.6	249.623	0.9637	211	211
15	B	G_C0_L0	8727.6	243.078	0.9385	212	212
15	B	G_C0_L1	6845.79	190.666	0.7361	213	213
15	B	G_C0_L2	1793.19	49.9433	0.1928	214	214
16	B	G_C2_L3	8999.66	250.655	0.9677	215	215
16	B	G_C0_L2	6131.02	170.759	0.6592	216	216
16	B	G_C1_L2	4703.47	130.999	0.5057	217	217
16	B	G_C1_L4	6586.19	183.436	0.7082	218	218
16	B	G_C0_L0	7956.35	221.597	0.8555	219	219
16	B	G_C2_L4	6233.12	173.602	0.6702	220	220
16	B	G_C1_L3	5246.38	146.12	0.5641	221	221
17	B	G_C0_L3	5780.85	161.006	0.6216	222	222
17	B	G_C1_L2	8515.02	237.157	0.9156	223	223
17	B	G_C2_L3	7738.21	215.522	0.8321	224	224
17	B	G_C0_L4	7752.54	215.921	0.8336	225	225
17	B	G_C0_L1	9124.63	254.136	0.9811	226	226
18	B	G_C1_L1	8001.31	222.849	0.8604	227	227
18	B	G_C2_L0	7921.69	220.632	0.8518	228	228
18	B	G_C2_L1	7742.14	215.631	0.8325	229	229
18	B	G_C0_L1	1269.71	35.3634	0.1365	230	230
18	B	G_C1_L2	6101.73	169.943	0.6561	231	231
18	B	G_C2_L4	5631.41	156.844	0.6055	232	232
18	B	G_C1_L3	6905.79	192.337	0.7426	233	233
18	B	G_C0_L3	9113.1	253.814	0.9799	234	234
18	B	G_C1_L4	8552.02	238.188	0.9196	235	235
19	B	G_C2_L0	4383.98	122.101	0.4714	236	236
19	B	G_C1_L4	7212.43	200.878	0.7755	237	237
19	B	G_C0_L4	5657.94	157.583	0.6084	238	238
19	B	G_C0_L2	6363.58	177.236	0.6843	239	239
19	B	G_C2_L1	6122.64	170.525	0.6583	240	240
19	B	G_C2_L4	7016.23	195.413	0.7544	241	241
19	B	G_C2_L2	5095.73	141.924	0.5479	242	242

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
20	B	G_C2_L3	7788.15	216.913	0.8374	243	243
20	B	G_C0_L0	7950.48	221.434	0.8549	244	244
20	B	G_C2_L1	7155.92	199.304	0.7695	245	245
20	B	G_C2_L0	8708.04	242.533	0.9363	246	246
20	B	G_C0_L2	7872.2	219.253	0.8465	247	247
20	B	G_C1_L1	7883.81	219.577	0.8477	248	248
20	B	G_C0_L4	5293.83	147.442	0.5692	249	249
20	B	G_C0_L1	8525.06	237.437	0.9167	250	250
21	B	G_C1_L2	8678.41	241.708	0.9332	251	251
21	B	G_C0_L3	8122.93	226.237	0.8734	252	252
21	B	G_C2_L1	7702.39	214.524	0.8282	253	253
21	B	G_C2_L0	5892.98	164.129	0.6337	254	254
21	B	G_C0_L2	3919.9	109.176	0.4215	255	255
21	B	G_C0_L4	8597.65	239.458	0.9245	256	256
21	B	G_C1_L4	9219.58	256.78	0.9914	257	257
21	B	G_C1_L1	8728.4	243.1	0.9385	258	258
22	B	G_C1_L2	6730.61	187.458	0.7237	259	259
22	B	G_C2_L4	4190.91	116.724	0.4506	260	260
22	B	G_C0_L4	8498.01	236.683	0.9138	261	261
22	B	G_C2_L1	3064.56	85.353	0.3295	262	262
22	B	G_C1_L1	6596.8	183.731	0.7093	263	263
22	B	G_C1_L4	4190.08	116.701	0.4505	264	264
22	B	G_C0_L3	7324.82	204.008	0.7876	265	265
22	B	G_C0_L0	7200.79	200.554	0.7743	266	266
23	B	G_C2_L3	3956.57	110.197	0.4254	267	267
23	B	G_C0_L0	6203.16	172.768	0.667	268	268
23	B	G_C1_L4	7322.99	203.957	0.7874	269	269
23	B	G_C2_L0	8591.32	239.282	0.9238	270	270
23	B	G_C1_L2	8744.72	243.555	0.9403	271	271
23	B	G_C0_L2	9065.73	252.495	0.9748	272	272
23	B	G_C2_L4	5273.97	146.889	0.5671	273	273
23	B	G_C0_L4	7748.75	215.815	0.8332	274	274
23	B	G_C0_L3	5863.76	163.315	0.6305	275	275
24	B	G_C2_L4	2755.9	76.7563	0.2963	276	276
24	B	G_C2_L3	8342.33	232.347	0.897	277	277
24	B	G_C2_L1	6070.81	169.082	0.6528	278	278
24	B	G_C1_L1	5207.22	145.03	0.5599	279	279
24	B	G_C0_L0	6056.5	168.683	0.6512	280	280
24	B	G_C0_L4	3008.95	83.8041	0.3235	281	281
25	B	G_C1_L1	5210.39	145.118	0.5603	282	282
25	B	G_C1_L0	7098.77	197.712	0.7633	283	283
25	B	G_C1_L3	2278.95	63.4725	0.245	284	284
25	B	G_C1_L2	4668.27	130.019	0.502	285	285
25	B	G_C2_L0	8367.24	233.041	0.8997	286	286
25	B	G_C0_L4	8322.29	231.789	0.8949	287	287
26	B	G_C0_L2	6738.6	187.681	0.7246	288	288
26	B	G_C0_L4	4623.82	128.781	0.4972	289	289
26	B	G_C1_L4	4219.43	117.518	0.4537	290	290
26	B	G_C2_L3	6028.17	167.894	0.6482	291	291
26	B	G_C0_L1	8102.71	225.674	0.8713	292	292
26	B	G_C0_L3	4456.57	124.123	0.4792	293	293
27	B	G_C0_L3	7310.87	203.619	0.7861	294	294
27	B	G_C1_L3	8215.39	228.812	0.8834	295	295
27	B	G_C2_L2	5929.37	165.143	0.6376	296	296
27	B	G_C1_L1	9138.22	254.514	0.9826	297	297
27	B	G_C2_L3	7046.55	196.258	0.7577	298	298
27	B	G_C1_L4	7090.7	197.488	0.7624	299	299
27	B	G_C2_L4	8313.73	231.551	0.8939	300	300
27	B	G_C1_L0	4417.16	123.025	0.475	301	301
28	B	G_C0_L2	6262.12	174.41	0.6733	302	302
28	B	G_C2_L1	8636.48	240.54	0.9287	303	303
28	B	G_C1_L2	5477.45	152.556	0.589	304	304
28	B	G_C0_L4	9149.4	254.826	0.9838	305	305
28	B	G_C1_L1	9086.56	253.075	0.977	306	306
28	B	G_C0_L1	3771	105.028	0.4055	307	307
28	B	G_C0_L3	7939.54	221.129	0.8537	308	308
28	B	G_C2_L4	6881.37	191.657	0.7399	309	309
29	B	G_C1_L0	8801.97	245.149	0.9464	310	310

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
29	B	G_C2_L2	6668.26	185.722	0.717	311	311
29	B	G_C0_L0	4823.9	134.353	0.5187	312	312
29	B	G_C0_L2	1378.57	38.3954	0.1482	313	313
29	B	G_C1_L1	979.751	27.2877	0.1053	314	314
29	B	G_C1_L3	6781.01	188.862	0.7291	315	315
29	B	G_C1_L4	4397.51	122.478	0.4729	316	316
29	B	G_C1_L2	8408.71	234.196	0.9042	317	317
30	B	G_C0_L4	7655.04	213.205	0.8231	318	318
30	B	G_C2_L4	6863.69	191.165	0.738	319	319
30	B	G_C1_L4	7408.85	206.348	0.7967	320	320
30	B	G_C0_L0	5508.54	153.422	0.5923	321	321
30	B	G_C0_L3	4413.71	122.929	0.4746	322	322
30	B	G_C2_L0	6224.84	173.372	0.6693	323	323
30	B	G_C1_L2	4484.97	124.914	0.4823	324	324
30	B	G_C2_L3	4211.91	117.308	0.4529	325	325
30	B	G_C1_L3	3150.11	87.7358	0.3387	326	326
31	B	G_C1_L1	7383.23	205.635	0.7939	327	327
31	B	G_C0_L4	9088.31	253.124	0.9772	328	328
31	B	G_C0_L2	7152.21	199.201	0.7691	329	329
31	B	G_C2_L0	3849.3	107.209	0.4139	330	330
31	B	G_C1_L3	8751.29	243.738	0.941	331	331
31	B	G_C2_L3	8554.96	238.269	0.9199	332	332
31	B	G_C1_L0	4963.69	138.247	0.5337	333	333
32	B	G_C2_L0	6745.14	187.863	0.7253	334	334
32	B	G_C1_L3	3327.07	92.6644	0.3577	335	335
32	B	G_C0_L3	6508.96	181.285	0.6999	336	336
32	B	G_C1_L2	6723.75	187.267	0.723	337	337
32	B	G_C2_L3	9073.98	252.725	0.9757	338	338
32	B	G_C2_L4	4944.21	137.704	0.5316	339	339
33	B	G_C0_L4	6416.4	178.707	0.6899	340	340
33	B	G_C1_L4	7186.75	200.163	0.7728	341	341
33	B	G_C1_L3	8482.73	236.258	0.9121	342	342
33	B	G_C1_L1	7282.81	202.838	0.7831	343	343
33	B	G_C1_L0	7815.22	217.667	0.8403	344	344
34	B	G_C0_L2	9184.06	255.791	0.9875	345	345
34	B	G_C1_L0	6422.71	178.883	0.6906	346	346
34	B	G_C0_L3	8799.21	245.072	0.9462	347	347
34	B	G_C1_L2	7478.79	208.296	0.8042	348	348
34	B	G_C0_L4	6987.79	194.621	0.7514	349	349
35	B	G_C0_L3	5421.3	150.992	0.5829	350	350
35	B	G_C2_L1	5014.82	139.671	0.5392	351	351
35	B	G_C1_L2	7616.27	212.125	0.819	352	352
35	B	G_C2_L0	8572.83	238.767	0.9218	353	353
35	B	G_C1_L4	8987.43	250.314	0.9664	354	354
35	B	G_C0_L1	6666.87	185.683	0.7169	355	355
35	B	G_C2_L2	6448.91	179.613	0.6934	356	356
35	B	G_C0_L0	9060.27	252.343	0.9742	357	357
35	B	G_C2_L3	4800.92	133.714	0.5162	358	358
36	B	G_C0_L4	8649.09	240.891	0.93	359	359
36	B	G_C1_L4	3690.95	102.799	0.3969	360	360
36	B	G_C2_L4	6185.16	172.267	0.6651	361	361
36	B	G_C2_L3	2239.04	62.3608	0.2408	362	362
36	B	G_C2_L1	6862.96	191.144	0.738	363	363
37	B	G_C1_L4	7607.99	211.895	0.8181	364	364
37	B	G_C1_L2	8776.63	244.443	0.9437	365	365
37	B	G_C0_L4	7001.15	194.993	0.7528	366	366
37	B	G_C1_L3	9232.83	257.149	0.9928	367	367
37	B	G_C2_L1	9068.69	252.577	0.9751	368	368
37	B	G_C0_L1	5478.54	152.586	0.5891	369	369
37	B	G_C0_L0	9139.09	254.538	0.9827	370	370
37	B	G_C0_L3	5793.52	161.359	0.623	371	371
37	B	G_C2_L0	8714.94	242.725	0.9371	372	372
38	B	G_C0_L2	8866.35	246.942	0.9534	373	373
38	B	G_C2_L3	7440.91	207.241	0.8001	374	374
38	B	G_C0_L0	8279.61	230.601	0.8903	375	375
38	B	G_C1_L4	3027.67	84.3254	0.3256	376	376
38	B	G_C2_L4	7519.96	209.443	0.8086	377	377
39	B	G_C2_L3	4701.13	130.934	0.5055	378	378

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
39	B	G_C2_L4	8049.51	224.192	0.8655	379	379
39	B	G_C1_L1	8987.5	250.316	0.9664	380	380
39	B	G_C1_L0	4364.8	121.567	0.4693	381	381
39	B	G_C2_L0	5415.5	150.83	0.5823	382	382
39	B	G_C0_L0	5096.47	141.945	0.548	383	383
39	B	G_C0_L3	5390.82	150.143	0.5797	384	384
39	B	G_C1_L2	8919.69	248.428	0.9591	385	385
40	B	G_C2_L3	7323.77	203.979	0.7875	386	386
40	B	G_C0_L1	7083.68	197.292	0.7617	387	387
40	B	G_C2_L2	8857.98	246.709	0.9525	388	388
40	B	G_C1_L2	7913.11	220.393	0.8509	389	389
40	B	G_C2_L0	5160.1	143.717	0.5548	390	390
41	B	G_C2_L2	6320.42	176.034	0.6796	391	391
41	B	G_C0_L0	6979.68	194.395	0.7505	392	392
41	B	G_C0_L3	8245.27	229.644	0.8866	393	393
41	B	G_C2_L1	7656.57	213.248	0.8233	394	394
41	B	G_C1_L1	7958.4	221.654	0.8557	395	395
41	B	G_C2_L3	7989.41	222.518	0.8591	396	396
41	B	G_C1_L2	6317.92	175.964	0.6793	397	397
42	B	G_C2_L4	7756.54	216.032	0.834	398	398
42	B	G_C2_L0	7833.31	218.17	0.8423	399	399
42	B	G_C1_L0	3420.24	95.2593	0.3678	400	400
42	B	G_C2_L3	8077.76	224.979	0.8686	401	401
42	B	G_C0_L3	8928.56	248.675	0.9601	402	402
42	B	G_C1_L2	9280.04	258.464	0.9979	403	403
42	B	G_C2_L1	9077.04	252.81	0.976	404	404
42	B	G_C1_L1	6828.02	190.171	0.7342	405	405
42	B	G_C0_L0	8218.74	228.905	0.8837	406	406
43	B	G_C0_L4	8231.33	229.256	0.8851	407	407
43	B	G_C2_L2	3509.5	97.7451	0.3774	408	408
43	B	G_C0_L1	2260.73	62.9649	0.2431	409	409
43	B	G_C1_L2	8808.26	245.324	0.9471	410	410
43	B	G_C2_L4	6717.23	187.086	0.7223	411	411
43	B	G_C1_L1	6814.39	189.792	0.7327	412	412
43	B	G_C0_L0	7575.59	210.992	0.8146	413	413
44	B	G_C1_L1	5913.46	164.699	0.6359	414	414
44	B	G_C2_L1	8338.06	232.228	0.8966	415	415
44	B	G_C1_L4	6699.74	186.599	0.7204	416	416
44	B	G_C2_L2	4557.96	126.946	0.4901	417	417
44	B	G_C1_L2	4903.46	136.569	0.5273	418	418
44	B	G_C1_L3	9238.96	257.32	0.9934	419	419
44	B	G_C0_L0	8579.37	238.949	0.9225	420	420
44	B	G_C2_L4	5810.35	161.828	0.6248	421	421
45	B	G_C0_L0	6643.19	185.024	0.7143	422	422
45	B	G_C0_L3	4329.92	120.595	0.4656	423	423
45	B	G_C1_L0	8426.85	234.701	0.9061	424	424
45	B	G_C2_L1	8562.62	238.483	0.9207	425	425
45	B	G_C0_L1	6631.77	184.706	0.7131	426	426
45	B	G_C0_L2	8263.79	230.16	0.8886	427	427
46	B	G_C0_L0	7795.97	217.13	0.8383	428	428
46	B	G_C0_L2	7614.6	212.079	0.8188	429	429
46	B	G_C0_L1	7388.46	205.781	0.7945	430	430
46	B	G_C1_L3	6395.38	178.122	0.6877	431	431
46	B	G_C2_L3	7486.15	208.501	0.805	432	432
46	B	G_C1_L0	8073.6	224.863	0.8681	433	433
46	B	G_C1_L2	4481.62	124.82	0.4819	434	434
47	B	G_C1_L0	9202.76	256.312	0.9895	435	435
47	B	G_C2_L2	7828.63	218.04	0.8418	436	436
47	B	G_C1_L2	7420.1	206.662	0.7979	437	437
47	B	G_C1_L3	5391.63	150.166	0.5797	438	438
47	B	G_C2_L1	3374.56	93.987	0.3629	439	439
48	B	G_C0_L3	5960.36	166.006	0.6409	440	440
48	B	G_C1_L2	7916.19	220.479	0.8512	441	441
48	B	G_C0_L2	5891.07	164.076	0.6334	442	442
48	B	G_C0_L4	7791.5	217.006	0.8378	443	443
48	B	G_C1_L1	6106.99	170.089	0.6567	444	444
49	B	G_C1_L2	4182.42	116.487	0.4497	445	445
49	B	G_C1_L0	5645.41	157.234	0.607	446	446

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
49	B	G_C1_L3	8569.59	238.677	0.9215	447	447
49	B	G_C1_L1	6975.45	194.278	0.75	448	448
49	B	G_C1_L4	7024.47	195.643	0.7553	449	449
49	B	G_C0_L0	2906.33	80.946	0.3125	450	450
49	B	G_C2_L0	5004.78	139.391	0.5381	451	451
49	B	G_C0_L3	6315.03	175.884	0.679	452	452
50	B	G_C2_L3	7538.02	209.946	0.8105	453	453
50	B	G_C1_L3	8036.45	223.828	0.8641	454	454
50	B	G_C1_L2	7314.39	203.718	0.7865	455	455
50	B	G_C1_L4	4692.76	130.701	0.5046	456	456
50	B	G_C2_L0	8527.76	237.512	0.917	457	457
50	B	G_C0_L0	2846.11	79.2687	0.306	458	458
50	B	G_C0_L2	5864.16	163.326	0.6306	459	459
51	B	G_C2_L2	4936.44	137.488	0.5308	460	460
51	B	G_C0_L4	6756.57	188.181	0.7265	461	461
51	B	G_C2_L4	4657.58	129.721	0.5008	462	462
51	B	G_C2_L0	7346.19	204.603	0.7899	463	463
51	B	G_C0_L2	5899.06	164.298	0.6343	464	464
52	B	G_C1_L0	8861.25	246.8	0.9528	465	465
52	B	G_C1_L2	9219.73	256.784	0.9914	466	466
52	B	G_C0_L0	8085.28	225.188	0.8694	467	467
52	B	G_C1_L1	6482.78	180.556	0.6971	468	468
52	B	G_C1_L3	6977.68	194.34	0.7503	469	469
52	B	G_C2_L2	7037.15	195.996	0.7567	470	470
52	B	G_C2_L4	3756.86	104.635	0.404	471	471
52	B	G_C1_L4	5913.73	164.707	0.6359	472	472
53	B	G_C0_L2	3034.39	84.5127	0.3263	473	473
53	B	G_C1_L4	3394.98	94.5557	0.3651	474	474
53	B	G_C0_L1	6448.8	179.609	0.6934	475	475
53	B	G_C1_L2	6098.79	169.861	0.6558	476	476
53	B	G_C2_L4	8090.66	225.338	0.87	477	477
53	B	G_C1_L0	8941.89	249.046	0.9615	478	478
53	B	G_C2_L1	5225.07	145.527	0.5618	479	479
53	B	G_C1_L1	7460.11	207.776	0.8022	480	480
54	B	G_C2_L4	4859.01	135.331	0.5225	481	481
54	B	G_C1_L1	9201.33	256.272	0.9894	482	482
54	B	G_C2_L0	5179.02	144.244	0.5569	483	483
54	B	G_C1_L2	7467.41	207.979	0.8029	484	484
54	B	G_C0_L1	6283.35	175.001	0.6756	485	485
55	B	G_C0_L1	6922.82	192.812	0.7444	486	486
55	B	G_C1_L3	7267.02	202.398	0.7814	487	487
55	B	G_C0_L2	8714.9	242.724	0.9371	488	488
55	B	G_C2_L0	4739.3	131.997	0.5096	489	489
55	B	G_C1_L4	7879.95	219.469	0.8473	490	490
55	B	G_C1_L1	5983.66	166.655	0.6434	491	491
55	B	G_C0_L0	9094.78	253.304	0.9779	492	492
56	B	G_C1_L1	8656.14	241.087	0.9308	493	493
56	B	G_C2_L1	7027.84	195.737	0.7557	494	494
56	B	G_C2_L4	5704.4	158.877	0.6134	495	495
56	B	G_C2_L2	6640.88	184.959	0.7141	496	496
56	B	G_C0_L0	8628.54	240.319	0.9278	497	497
56	B	G_C1_L3	2555.15	71.165	0.2747	498	498
56	B	G_C1_L0	3084.07	85.8963	0.3316	499	499
56	B	G_C0_L2	6524.45	181.716	0.7016	500	500
57	B	G_C2_L0	7947.03	221.338	0.8545	501	501
57	B	G_C1_L3	3449.74	96.0808	0.3709	502	502
57	B	G_C1_L4	6219.99	173.237	0.6688	503	503
57	B	G_C0_L3	6857.83	191.002	0.7374	504	504
57	B	G_C0_L0	2895.52	80.6449	0.3113	505	505
57	B	G_C2_L2	3852.4	107.296	0.4142	506	506
57	B	G_C2_L4	7794.93	217.101	0.8382	507	507
58	B	G_C0_L3	7823.73	217.904	0.8413	508	508
58	B	G_C0_L2	4069.42	113.34	0.4376	509	509
58	B	G_C0_L4	7043.6	196.175	0.7574	510	510
58	B	G_C1_L0	7676.32	213.798	0.8254	511	511
58	B	G_C0_L1	8110.58	225.893	0.8721	512	512
58	B	G_C2_L1	6522.22	181.654	0.7013	513	513
58	B	G_C1_L2	6851.83	190.834	0.7368	514	514

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58	B	G_C1_L3	8449.78	235.34	0.9086	515	515
59	B	G_C0_L2	1648.04	45.9007	0.1772	516	516
59	B	G_C2_L3	2805.89	78.1486	0.3017	517	517
59	B	G_C0_L4	7788.34	216.918	0.8375	518	518
59	B	G_C1_L4	6821.19	189.981	0.7335	519	519
59	B	G_C2_L0	8837.98	246.152	0.9503	520	520
59	B	G_C0_L1	6342.37	176.645	0.682	521	521
59	B	G_C0_L3	8005.94	222.978	0.8609	522	522
59	B	G_C1_L0	4930.62	137.326	0.5302	523	523
60	B	G_C2_L3	1924.05	53.5879	0.2069	524	524
60	B	G_C1_L3	8029.18	223.626	0.8634	525	525
60	B	G_C1_L1	7881.92	219.524	0.8475	526	526
60	B	G_C0_L0	5431.75	151.283	0.5841	527	527
60	B	G_C2_L4	4182.41	116.487	0.4497	528	528
60	B	G_C0_L4	6586.44	183.443	0.7082	529	529
60	B	G_C2_L1	3521.61	98.0824	0.3787	530	530
60	B	G_C1_L0	8082.91	225.122	0.8691	531	531
60	B	G_C2_L2	5660.36	157.65	0.6086	532	532
61	B	G_C1_L0	8230.92	229.244	0.885	533	533
61	B	G_C0_L0	2427.65	67.6139	0.261	534	534
61	B	G_C2_L0	8704.05	242.422	0.9359	535	535
61	B	G_C1_L4	6366.99	177.331	0.6846	536	536
61	B	G_C2_L2	8147.19	226.912	0.876	537	537
61	B	G_C0_L4	7145.58	199.016	0.7683	538	538
61	B	G_C2_L1	9245.28	257.496	0.9941	539	539
61	B	G_C2_L4	7504.89	209.023	0.807	540	540
62	B	G_C0_L4	6918.05	192.679	0.7439	541	541
62	B	G_C0_L3	5946.36	165.616	0.6394	542	542
62	B	G_C2_L4	6947.76	193.506	0.7471	543	543
62	B	G_C2_L3	6593.76	183.647	0.709	544	544
62	B	G_C2_L0	4681.24	130.38	0.5034	545	545
62	B	G_C0_L0	6503.68	181.138	0.6993	546	546
62	B	G_C1_L3	7854.31	218.755	0.8445	547	547
63	B	G_C2_L0	6349.75	176.851	0.6828	548	548
63	B	G_C1_L1	5774.8	160.838	0.6209	549	549
63	B	G_C1_L4	5188.14	144.498	0.5579	550	550
63	B	G_C2_L3	3488.9	97.1714	0.3752	551	551
63	B	G_C2_L4	4203.36	117.07	0.452	552	552
63	B	G_C0_L0	4050.37	112.809	0.4355	553	553
63	B	G_C1_L2	3451.87	96.1401	0.3712	554	554
63	B	G_C0_L1	5077.53	141.417	0.546	555	555
63	B	G_C0_L2	6298.76	175.431	0.6773	556	556
64	B	G_C2_L3	7832.24	218.141	0.8422	557	557
64	B	G_C0_L2	7769.51	216.393	0.8354	558	558
64	B	G_C1_L0	8585.07	239.108	0.9231	559	559
64	B	G_C0_L1	8645.15	240.781	0.9296	560	560
64	B	G_C1_L2	4558.16	126.952	0.4901	561	561
64	B	G_C1_L3	4961.97	138.199	0.5335	562	562
64	B	G_C1_L4	3074.11	85.619	0.3305	563	563
65	B	G_C2_L2	8072.51	224.832	0.868	564	564
65	B	G_C2_L0	6249.53	174.06	0.672	565	565
65	B	G_C0_L0	9200.47	256.248	0.9893	566	566
65	B	G_C0_L1	5712.41	159.1	0.6142	567	567
65	B	G_C1_L1	8349.72	232.553	0.8978	568	568
66	B	G_C2_L1	1919.09	53.4499	0.2064	569	569
66	B	G_C0_L0	1082.8	30.1576	0.1164	570	570
66	B	G_C0_L2	7014.08	195.353	0.7542	571	571
66	B	G_C1_L3	9006.88	250.856	0.9685	572	572
66	B	G_C1_L4	5979.55	166.54	0.643	573	573
66	B	G_C0_L4	4755.15	132.439	0.5113	574	574
66	B	G_C1_L0	5185.12	144.414	0.5575	575	575
67	B	G_C2_L3	9201.4	256.274	0.9894	576	576
67	B	G_C0_L0	5764.7	160.556	0.6199	577	577
67	B	G_C2_L0	7807.67	217.456	0.8395	578	578
67	B	G_C0_L3	3945.94	109.901	0.4243	579	579
67	B	G_C0_L2	6014.4	167.511	0.6467	580	580
67	B	G_C0_L1	7868.98	219.164	0.8461	581	581
67	B	G_C2_L1	7056.48	196.534	0.7588	582	582

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67	B	G_C0_L4	9236.9	257.263	0.9932	583	583
67	B	G_C1_L3	7934.74	220.995	0.8532	584	584
68	B	G_C1_L4	7206.11	200.702	0.7749	585	585
68	B	G_C0_L2	5125.64	142.757	0.5511	586	586
68	B	G_C2_L3	3514.48	97.8839	0.3779	587	587
68	B	G_C2_L2	8813.33	245.465	0.9477	588	588
68	B	G_C0_L0	7195.59	200.409	0.7737	589	589
68	B	G_C2_L4	5355.3	149.154	0.5758	590	590
69	B	G_C2_L1	6228.35	173.47	0.6697	591	591
69	B	G_C0_L1	6456.54	179.825	0.6943	592	592
69	B	G_C1_L0	5660.68	157.659	0.6087	593	593
69	B	G_C0_L3	7433.05	207.023	0.7993	594	594
69	B	G_C1_L4	6033.82	168.052	0.6488	595	595
69	B	G_C0_L0	5980.28	166.56	0.643	596	596
69	B	G_C2_L3	5891.35	164.084	0.6335	597	597
69	B	G_C1_L3	5647.1	157.281	0.6072	598	598
69	B	G_C0_L4	5910.39	164.614	0.6355	599	599
70	B	G_C1_L1	5855.05	163.073	0.6296	600	600
70	B	G_C0_L3	8852.95	246.569	0.9519	601	601
70	B	G_C2_L3	2500.35	69.6387	0.2689	602	602
70	B	G_C0_L4	8229.14	229.195	0.8849	603	603
70	B	G_C0_L2	8104	225.709	0.8714	604	604
70	B	G_C2_L2	3630.24	101.108	0.3903	605	605
71	B	G_C2_L3	6065.03	168.921	0.6522	606	606
71	B	G_C1_L0	5050.69	140.67	0.5431	607	607
71	B	G_C2_L4	7798.02	217.187	0.8385	608	608
71	B	G_C0_L4	6538.09	182.096	0.703	609	609
71	B	G_C0_L3	7520.92	209.47	0.8087	610	610
71	B	G_C1_L1	8566.78	238.599	0.9212	611	611
71	B	G_C2_L2	9122.16	254.067	0.9809	612	612
71	B	G_C0_L1	938.515	26.1392	0.1009	613	613
71	B	G_C2_L1	5380.29	149.85	0.5785	614	614
72	B	G_C0_L2	7483.54	208.429	0.8047	615	615
72	B	G_C2_L1	7572.91	210.918	0.8143	616	616
72	B	G_C2_L2	9083.65	252.994	0.9767	617	617
72	B	G_C1_L3	6189.3	172.382	0.6655	618	618
72	B	G_C1_L2	6288.75	175.152	0.6762	619	619
73	B	G_C2_L1	8023.92	223.479	0.8628	620	620
73	B	G_C1_L3	6416.48	178.709	0.6899	621	621
73	B	G_C1_L4	7575.36	210.986	0.8146	622	622
73	B	G_C1_L2	5542.84	154.377	0.596	623	623
73	B	G_C0_L2	7190.71	200.273	0.7732	624	624
73	B	G_C2_L3	7359.9	204.985	0.7914	625	625
74	B	G_C2_L1	7767.11	216.327	0.8352	626	626
74	B	G_C2_L2	9255.22	257.773	0.9952	627	627
74	B	G_C2_L3	4468.06	124.443	0.4804	628	628
74	B	G_C1_L0	7486.13	208.501	0.805	629	629
74	B	G_C2_L0	7919.28	220.565	0.8515	630	630
74	B	G_C0_L3	7867.18	219.114	0.8459	631	631
74	B	G_C1_L1	6138.26	170.96	0.66	632	632
75	B	G_C0_L3	8159.41	227.253	0.8774	633	633
75	B	G_C0_L4	7686.27	214.075	0.8265	634	634
75	B	G_C1_L3	6806.39	189.569	0.7319	635	635
75	B	G_C1_L1	7297.17	203.238	0.7846	636	636
75	B	G_C1_L0	1450.27	40.3924	0.1559	637	637
75	B	G_C2_L2	3479.2	96.9013	0.3741	638	638
75	B	G_C2_L1	6601.43	183.86	0.7098	639	639
75	B	G_C0_L0	8223.07	229.026	0.8842	640	640
76	B	G_C1_L3	4266.03	118.816	0.4587	641	641
76	B	G_C2_L1	5462.6	152.142	0.5874	642	642
76	B	G_C2_L3	6972.2	194.187	0.7497	643	643
76	B	G_C0_L1	6433.44	179.182	0.6918	644	644
76	B	G_C1_L1	6992.58	194.755	0.7519	645	645
76	B	G_C2_L0	7305.66	203.474	0.7856	646	646
76	B	G_C2_L4	5592.43	155.758	0.6013	647	647
76	B	G_C0_L4	6280.25	174.915	0.6753	648	648
77	B	G_C1_L0	5204.68	144.959	0.5596	649	649
77	B	G_C1_L4	4389.66	122.259	0.472	650	650

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
77	B	G_C2_L4	5810.21	161.824	0.6248	651	651
77	B	G_C2_L0	8049.43	224.19	0.8655	652	652
77	B	G_C0_L4	8531.02	237.603	0.9173	653	653
77	B	G_C0_L3	5237.5	145.873	0.5632	654	654
77	B	G_C0_L1	8727.8	243.083	0.9385	655	655
77	B	G_C1_L2	7365.45	205.14	0.792	656	656
78	B	G_C1_L4	6436.52	179.267	0.6921	657	657
78	B	G_C1_L1	8576.15	238.86	0.9222	658	658
78	B	G_C0_L4	7570.32	210.846	0.814	659	659
78	B	G_C2_L4	7668.89	213.591	0.8246	660	660
78	B	G_C0_L3	4394.86	122.404	0.4726	661	661
78	B	G_C0_L2	8668.53	241.433	0.9321	662	662
78	B	G_C2_L0	7793.54	217.063	0.838	663	663
79	B	G_C1_L1	9154.86	254.977	0.9844	664	664
79	B	G_C0_L0	2554.16	71.1376	0.2746	665	665
79	B	G_C2_L3	7317.12	203.794	0.7868	666	666
79	B	G_C2_L4	4312.94	120.122	0.4638	667	667
79	B	G_C0_L4	9046.84	251.969	0.9728	668	668
80	B	G_C0_L4	5120.62	142.618	0.5506	669	669
80	B	G_C2_L0	2941.07	81.9134	0.3162	670	670
80	B	G_C0_L3	7331.81	204.203	0.7884	671	671
80	B	G_C1_L2	6160.89	171.591	0.6625	672	672
80	B	G_C0_L1	7612.58	212.023	0.8186	673	673
80	B	G_C0_L0	7470.75	208.072	0.8033	674	674
80	B	G_C2_L4	9220.98	256.819	0.9915	675	675
80	B	G_C2_L2	4891	136.222	0.5259	676	676
81	B	G_C0_L2	6839.54	190.492	0.7354	677	677
81	B	G_C1_L1	7686.48	214.081	0.8265	678	678
81	B	G_C2_L4	6773.86	188.663	0.7284	679	679
81	B	G_C2_L2	7626.35	212.406	0.82	680	680
81	B	G_C2_L1	8989.07	250.36	0.9666	681	681
81	B	G_C0_L3	5189.85	144.546	0.558	682	682
81	B	G_C2_L0	8643.63	240.739	0.9294	683	683
81	B	G_C0_L4	6490.28	180.765	0.6979	684	684
81	B	G_C1_L2	6029.65	167.935	0.6483	685	685
82	B	G_C0_L1	7712.38	214.802	0.8293	686	686
82	B	G_C0_L3	6221.98	173.292	0.669	687	687
82	B	G_C1_L2	7445.11	207.358	0.8005	688	688
82	B	G_C1_L3	4063.24	113.168	0.4369	689	689
82	B	G_C1_L4	7553.02	210.364	0.8122	690	690
82	B	G_C2_L3	8283.69	230.714	0.8907	691	691
82	B	G_C0_L2	5187.09	144.469	0.5578	692	692
83	B	G_C1_L1	7928.16	220.812	0.8525	693	693
83	B	G_C1_L3	8888.29	247.553	0.9557	694	694
83	B	G_C1_L0	3103.71	86.4433	0.3337	695	695
83	B	G_C1_L2	6330.83	176.324	0.6807	696	696
83	B	G_C2_L4	7010.13	195.244	0.7538	697	697
83	B	G_C0_L3	4490.45	125.066	0.4828	698	698
83	B	G_C2_L3	8651.53	240.959	0.9303	699	699
84	B	G_C2_L2	8199.3	228.364	0.8816	700	700
84	B	G_C2_L4	3260.95	90.8228	0.3506	701	701
84	B	G_C2_L3	6209.19	172.936	0.6677	702	702
84	B	G_C1_L0	8025.36	223.519	0.8629	703	703
84	B	G_C0_L4	4393.92	122.378	0.4725	704	704
84	B	G_C1_L2	7297.06	203.235	0.7846	705	705
84	B	G_C0_L2	9102.24	253.512	0.9787	706	706
85	B	G_C1_L1	6713.91	186.993	0.7219	707	707
85	B	G_C1_L4	8520.41	237.307	0.9162	708	708
85	B	G_C0_L3	8959.94	249.549	0.9634	709	709
85	B	G_C2_L0	3391.94	94.471	0.3647	710	710
85	B	G_C2_L2	6564.77	182.839	0.7059	711	711
85	B	G_C0_L1	7880.9	219.496	0.8474	712	712
85	B	G_C0_L2	3656.53	101.84	0.3932	713	713
86	B	G_C1_L3	8186.79	228.015	0.8803	714	714
86	B	G_C2_L4	6017.81	167.606	0.6471	715	715
86	B	G_C0_L3	9095.97	253.337	0.9781	716	716
86	B	G_C1_L2	7882.7	219.546	0.8476	717	717
86	B	G_C1_L1	5518.46	153.698	0.5934	718	718

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
86	B	G_C0_L0	5087.76	141.702	0.5471	719	719
86	B	G_C2_L0	3536.48	98.4967	0.3803	720	720
86	B	G_C0_L1	9145.45	254.715	0.9834	721	721
87	B	G_C2_L2	6261.39	174.39	0.6733	722	722
87	B	G_C1_L2	6121.23	170.486	0.6582	723	723
87	B	G_C1_L4	7644.85	212.922	0.822	724	724
87	B	G_C0_L4	9061.56	252.379	0.9744	725	725
87	B	G_C0_L2	5033.85	140.201	0.5413	726	726
88	B	G_C1_L0	8315.36	231.596	0.8941	727	727
88	B	G_C2_L4	4532.44	126.236	0.4874	728	728
88	B	G_C0_L2	1652.87	46.035	0.1777	729	729
88	B	G_C0_L3	8151.31	227.027	0.8765	730	730
88	B	G_C0_L0	7679.74	213.893	0.8258	731	731
88	B	G_C2_L3	6667.64	185.705	0.717	732	732
88	B	G_C0_L4	9075.66	252.772	0.9759	733	733
88	B	G_C1_L1	5317.87	148.111	0.5718	734	734
89	B	G_C2_L3	6190.05	172.403	0.6656	735	735
89	B	G_C2_L1	3572.14	99.49	0.3841	736	736
89	B	G_C2_L4	7549.98	210.279	0.8118	737	737
89	B	G_C1_L4	6768.95	188.526	0.7278	738	738
89	B	G_C2_L0	9120.46	254.019	0.9807	739	739
89	B	G_C0_L3	6852.88	190.864	0.7369	740	740
89	B	G_C0_L1	4343.72	120.98	0.4671	741	741
89	B	G_C1_L0	8736.96	243.338	0.9395	742	742
89	B	G_C2_L2	7378.81	205.512	0.7934	743	743
90	B	G_C2_L1	3344.52	93.1503	0.3596	744	744
90	B	G_C0_L0	6849.32	190.765	0.7365	745	745
90	B	G_C1_L1	7342.57	204.502	0.7895	746	746
90	B	G_C1_L2	8305.57	231.323	0.8931	747	747
90	B	G_C1_L3	9239.53	257.336	0.9935	748	748
90	B	G_C0_L3	3207.44	89.3325	0.3449	749	749
90	B	G_C0_L1	6169.23	171.823	0.6634	750	750
91	B	G_C0_L1	8397.1	233.873	0.9029	751	751
91	B	G_C1_L0	6823.26	190.039	0.7337	752	752
91	B	G_C1_L2	5876.48	163.669	0.6319	753	753
91	B	G_C0_L2	9272.84	258.264	0.9971	754	754
91	B	G_C2_L1	6735.59	187.597	0.7243	755	755
91	B	G_C1_L3	3911.17	108.932	0.4206	756	756
91	B	G_C1_L4	8368.99	233.09	0.8999	757	757
91	B	G_C2_L4	6696.63	186.512	0.7201	758	758
91	B	G_C2_L3	4816.69	134.153	0.5179	759	759
92	B	G_C2_L1	6175.03	171.984	0.664	760	760
92	B	G_C0_L4	4267.54	118.858	0.4589	761	761
92	B	G_C2_L2	5006.53	139.44	0.5383	762	762
92	B	G_C0_L3	9291.37	258.78	0.9991	763	763
92	B	G_C1_L0	7230.01	201.368	0.7774	764	764
92	B	G_C1_L4	6938.59	193.251	0.7461	765	765
92	B	G_C1_L1	3940.35	109.745	0.4237	766	766
92	B	G_C1_L3	6790.35	189.122	0.7301	767	767
93	B	G_C0_L1	8296.81	231.079	0.8921	768	768
93	B	G_C2_L2	6937.63	193.224	0.746	769	769
93	B	G_C1_L3	6925.17	192.877	0.7446	770	770
93	B	G_C0_L3	8933.71	248.818	0.9606	771	771
93	B	G_C2_L1	7867.73	219.129	0.846	772	772
93	B	G_C1_L0	5517	153.657	0.5932	773	773
94	B	G_C2_L4	7470.98	208.079	0.8033	774	774
94	B	G_C1_L2	4607.17	128.317	0.4954	775	775
94	B	G_C2_L2	6063.85	168.888	0.652	776	776
94	B	G_C2_L1	5212	145.163	0.5604	777	777
94	B	G_C0_L3	7857.61	218.847	0.8449	778	778
94	B	G_C0_L2	8342.72	232.358	0.8971	779	779
94	B	G_C2_L0	7336.27	204.327	0.7888	780	780
94	B	G_C0_L1	4587.16	127.76	0.4932	781	781
95	B	G_C2_L2	8204.63	228.512	0.8822	782	782
95	B	G_C2_L4	7489.61	208.598	0.8053	783	783
95	B	G_C0_L0	7020.18	195.523	0.7549	784	784
95	B	G_C2_L3	6781.33	188.871	0.7292	785	785
95	B	G_C1_L2	3076.16	85.6761	0.3308	786	786

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95	B	G_C1_L3	7113.2	198.114	0.7649	787	787
96	B	G_C0_L1	9256.99	257.822	0.9954	788	788
96	B	G_C2_L1	5294.61	147.463	0.5693	789	789
96	B	G_C0_L0	7618.76	212.195	0.8192	790	790
96	B	G_C2_L4	6968.07	194.072	0.7493	791	791
96	B	G_C0_L2	6695.87	186.491	0.72	792	792
96	B	G_C1_L2	3394.29	94.5364	0.365	793	793
96	B	G_C2_L2	5647.36	157.288	0.6072	794	794
97	B	G_C2_L1	6982.4	194.471	0.7508	795	795
97	B	G_C1_L1	5310.29	147.9	0.571	796	796
97	B	G_C1_L4	203.157	5.6582	0.0218	797	797
97	B	G_C0_L3	5703.05	158.839	0.6132	798	798
97	B	G_C0_L0	4972.69	138.498	0.5347	799	799
97	B	G_C0_L1	8492.15	236.52	0.9131	800	800
97	B	G_C1_L2	6720.41	187.174	0.7226	801	801
97	B	G_C0_L2	5452.52	151.862	0.5863	802	802
97	B	G_C2_L4	7945.83	221.304	0.8544	803	803
98	B	G_C2_L0	5362.56	149.356	0.5766	804	804
98	B	G_C0_L0	7783.67	216.788	0.837	805	805
98	B	G_C2_L1	8668.03	241.418	0.932	806	806
98	B	G_C2_L3	7140.01	198.861	0.7677	807	807
98	B	G_C0_L2	2937.24	81.807	0.3158	808	808
98	B	G_C1_L2	3706.1	103.221	0.3985	809	809
98	B	G_C1_L3	6807.5	189.6	0.732	810	810
99	B	G_C0_L1	6089.85	169.612	0.6548	811	811
99	B	G_C2_L3	4769.92	132.85	0.5129	812	812
99	B	G_C2_L1	5811.26	161.853	0.6249	813	813
99	B	G_C1_L4	8492.42	236.528	0.9132	814	814
99	B	G_C1_L3	5218.53	145.345	0.5611	815	815
99	B	G_C2_L0	7940.76	221.163	0.8538	816	816
99	B	G_C1_L1	4160.56	115.878	0.4474	817	817
100	B	G_C2_L0	8528.91	237.544	0.9171	818	818
100	B	G_C2_L2	8655.05	241.057	0.9307	819	819
100	B	G_C0_L1	5530.77	154.041	0.5947	820	820
100	B	G_C1_L1	8506.14	236.91	0.9146	821	821
100	B	G_C0_L2	7286.01	202.927	0.7834	822	822
100	B	G_C1_L3	7221.6	201.133	0.7765	823	823

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2	C	D_R_BOT	7113.81	198.131	0.7649	101	101
6	C	D_R_BOT	8603.16	239.612	0.9251	102	102
7	C	D_L_BOT	9204.45	256.359	0.9897	103	103
13	C	D_L_BOT	8435.55	234.944	0.907	104	104
15	C	D_L_BOT	5863.68	163.313	0.6305	105	105
18	C	D_R_BOT	9158.3	255.073	0.9848	106	106
23	C	D_L_BOT	8634.91	240.496	0.9285	107	107
24	C	D_R_BOT	9128.5	254.243	0.9816	108	108
25	C	D_L_BOT	4770.97	132.879	0.513	109	109
28	C	D_R_BOT	4238.84	118.058	0.4558	110	110
29	C	D_R_BOT	7534.85	209.858	0.8102	111	111
31	C	D_R_BOT	7668.11	213.569	0.8245	112	112
32	C	D_R_BOT	6415.99	178.696	0.6899	113	113
34	C	D_R_BOT	4054.43	112.922	0.436	114	114
39	C	D_R_BOT	2969.39	82.7024	0.3193	115	115
43	C	D_L_BOT	7502.75	208.964	0.8067	116	116
44	C	D_R_BOT	4353.89	121.263	0.4682	117	117
45	C	D_L_BOT	6101.73	169.943	0.6561	118	118
47	C	D_L_BOT	4094.02	114.025	0.4402	119	119
53	C	D_R_BOT	8680.72	241.772	0.9334	120	120
54	C	D_L_BOT	5949.02	165.69	0.6397	121	121
57	C	D_L_BOT	8207.58	228.594	0.8825	122	122
59	C	D_R_BOT	3989.86	111.124	0.429	123	123
60	C	D_L_BOT	4765.69	132.732	0.5124	124	124

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
63	C	D_R_BOT	5476.54	152.53	0.5889	125	125
68	C	D_L_BOT	8340.85	232.306	0.8969	126	126
72	C	D_L_BOT	8773.46	244.355	0.9434	127	127
77	C	D_L_BOT	6753.75	188.103	0.7262	128	128
80	C	D_R_BOT	6951.45	193.609	0.7475	129	129
82	C	D_L_BOT	8135.05	226.574	0.8747	130	130
83	C	D_L_BOT	7767.28	216.331	0.8352	131	131
93	C	D_L_BOT	7933.24	220.954	0.853	132	132
94	C	D_R_BOT	7880.06	219.472	0.8473	133	133
96	C	D_R_BOT	6916.3	192.63	0.7437	134	134
97	C	D_L_BOT	8066.83	224.674	0.8674	135	135
98	C	D_R_BOT	5896.76	164.234	0.6341	136	136

C.3.18 stochastic_traceability_log_GHS_D.csv

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
1	D	L_F_2	4237.57	118.023	0.4557	101	101
1	D	L_B_2	6810.25	189.677	0.7323	102	102
2	D	L_B_3	4882.08	135.974	0.525	103	103
2	D	L_F_1	7852.12	218.694	0.8443	104	104
2	D	L_F_2	7484.94	208.468	0.8048	105	105
3	D	L_B_3	7396.61	206.007	0.7953	106	106
3	D	L_F_3	5128.14	142.827	0.5514	107	107
4	D	L_B_1	7485.67	208.488	0.8049	108	108
4	D	L_F_2	7258.75	202.168	0.7805	109	109
4	D	L_B_5	8534.99	237.713	0.9177	110	110
5	D	L_B_2	7241.79	201.696	0.7787	111	111
5	D	L_B_3	5219.37	145.368	0.5612	112	112
6	D	L_F_3	6281.58	174.952	0.6754	113	113
6	D	L_B_2	8650.57	240.932	0.9302	114	114
7	D	L_F_3	4712.76	131.258	0.5067	115	115
8	D	L_F_4	9228.86	257.039	0.9924	116	116
8	D	L_F_3	8536.6	237.758	0.9179	117	117
8	D	L_F_5	8644.62	240.767	0.9295	118	118
9	D	L_F_2	8881.07	247.352	0.955	119	119
10	D	L_F_4	2872.88	80.0143	0.3089	120	120
10	D	L_F_2	5311.93	147.946	0.5712	121	121
10	D	L_B_5	4715.57	131.336	0.5071	122	122
11	D	L_F_5	8319.78	231.719	0.8946	123	123
12	D	L_B_5	6196.27	172.576	0.6663	124	124
12	D	L_F_5	5080.59	141.503	0.5463	125	125
13	D	L_F_2	7359.21	204.966	0.7913	126	126
14	D	L_B_1	4904.21	136.59	0.5273	127	127
14	D	L_B_2	5789.19	161.238	0.6225	128	128
15	D	L_B_2	4500.03	125.333	0.4839	129	129
16	D	L_F_1	8205	228.523	0.8823	130	130
16	D	L_F_2	6612.86	184.179	0.7111	131	131
17	D	L_F_2	5367.43	149.492	0.5771	132	132
18	D	L_F_2	9139.24	254.543	0.9827	133	133
18	D	L_F_4	7765.89	216.293	0.835	134	134
19	D	L_B_3	6327.4	176.228	0.6804	135	135
20	D	L_B_2	8092.41	225.387	0.8702	136	136
20	D	L_B_1	6419.77	178.801	0.6903	137	137
21	D	L_F_1	5968.73	166.239	0.6418	138	138
22	D	L_B_1	8309.07	231.421	0.8934	139	139
22	D	L_B_3	6075.46	169.211	0.6533	140	140
23	D	L_F_4	5959.98	165.995	0.6409	141	141
23	D	L_F_1	7145.59	199.016	0.7683	142	142
23	D	L_F_5	8668.68	241.437	0.9321	143	143
24	D	L_F_2	8246.52	229.679	0.8867	144	144
24	D	L_B_4	4589.5	127.825	0.4935	145	145
24	D	L_F_1	2206.07	61.4427	0.2372	146	146
25	D	L_B_1	6847.33	190.709	0.7363	147	147
25	D	L_F_4	7656.47	213.245	0.8233	148	148
26	D	L_B_1	5515.67	153.62	0.5931	149	149

Iteration_I	Hazard_Zo	Component	Applied_EX_	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	_ID	MPa	_mm	r_D	T_ID	L_ID
26	D	L_F_5	5379.07	149.816	0.5784	150	150
26	D	L_F_1	8696.66	242.216	0.9351	151	151
27	D	L_B_2	2231.76	62.158	0.24	152	152
27	D	L_B_1	6751.62	188.044	0.726	153	153
28	D	L_F_4	7917.77	220.523	0.8514	154	154
28	D	L_B_4	6435.26	179.232	0.692	155	155
28	D	L_F_5	8114.38	225.998	0.8725	156	156
29	D	L_F_5	5272.6	146.85	0.5669	157	157
30	D	L_B_1	4221.18	117.567	0.4539	158	158
31	D	L_B_4	8386.61	233.581	0.9018	159	159
32	D	L_B_2	6783.43	188.929	0.7294	160	160
32	D	L_F_1	9125.76	254.167	0.9813	161	161
33	D	L_B_3	7069.99	196.911	0.7602	162	162
34	D	L_F_4	8241.22	229.531	0.8862	163	163
34	D	L_B_4	8870.4	247.055	0.9538	164	164
34	D	L_B_3	5350.91	149.031	0.5754	165	165
35	D	L_F_2	6149.61	171.276	0.6612	166	166
36	D	L_F_1	4746.02	132.184	0.5103	167	167
36	D	L_F_5	4820.78	134.266	0.5184	168	168
36	D	L_F_2	6481.08	180.509	0.6969	169	169
37	D	L_B_2	5793.25	161.351	0.6229	170	170
38	D	L_F_2	5210.93	145.133	0.5603	171	171
38	D	L_B_3	2741.79	76.3632	0.2948	172	172
39	D	L_F_1	7097.93	197.689	0.7632	173	173
40	D	L_B_3	7082.77	197.267	0.7616	174	174
40	D	L_B_1	8438.66	235.03	0.9074	175	175
41	D	L_F_5	3791.46	105.598	0.4077	176	176
41	D	L_B_2	7036.12	195.967	0.7566	177	177
42	D	L_F_4	5979.69	166.544	0.643	178	178
43	D	L_B_4	9138.69	254.527	0.9827	179	179
43	D	L_F_5	6629.09	184.631	0.7128	180	180
44	D	L_F_3	6602.9	183.901	0.71	181	181
44	D	L_F_4	7153.73	199.243	0.7692	182	182
44	D	L_B_1	7953.63	221.521	0.8552	183	183
45	D	L_B_5	7179.76	199.968	0.772	184	184
46	D	L_B_3	7748.57	215.81	0.8332	185	185
46	D	L_B_5	4459.57	124.206	0.4795	186	186
47	D	L_B_1	7655.49	213.218	0.8232	187	187
48	D	L_F_1	4806.51	133.869	0.5168	188	188
48	D	L_B_4	8598.27	239.476	0.9245	189	189
49	D	L_F_3	5873.33	163.582	0.6315	190	190
49	D	L_B_4	5786.11	161.153	0.6222	191	191
50	D	L_B_3	8495.13	236.603	0.9135	192	192
51	D	L_F_3	6786.3	189.01	0.7297	193	193
51	D	L_B_5	7130.24	198.589	0.7667	194	194
52	D	L_B_4	2576.98	71.773	0.2771	195	195
53	D	L_F_4	3946.08	109.905	0.4243	196	196
54	D	L_F_5	7571.23	210.871	0.8141	197	197
55	D	L_B_2	1556.33	43.3462	0.1673	198	198
56	D	L_F_1	7339.93	204.429	0.7892	199	199
56	D	L_F_3	9088.62	253.133	0.9773	200	200
56	D	L_B_5	9238.97	257.32	0.9934	201	201
57	D	L_B_2	1759.36	49.001	0.1892	202	202
58	D	L_F_4	7315.77	203.756	0.7866	203	203
58	D	L_F_2	8111.52	225.919	0.8722	204	204
58	D	L_B_4	3371.27	93.8952	0.3625	205	205
59	D	L_B_3	6078.18	169.287	0.6536	206	206
59	D	L_B_5	4872.27	135.701	0.5239	207	207
59	D	L_F_2	5191.4	144.589	0.5582	208	208
60	D	L_F_4	1840.76	51.2682	0.1979	209	209
60	D	L_F_2	7915.42	220.457	0.8511	210	210
61	D	L_B_3	7852.89	218.716	0.8444	211	211
62	D	L_F_1	7256.18	202.096	0.7802	212	212
63	D	L_B_5	6807.97	189.613	0.732	213	213
63	D	L_F_3	2254.23	62.7839	0.2424	214	214
64	D	L_B_5	7745.05	215.712	0.8328	215	215
64	D	L_F_5	3820.05	106.395	0.4108	216	216
65	D	L_B_3	8100.04	225.599	0.871	217	217

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
65	D	L_F_3	5529.86	154.016	0.5946	218	218
65	D	L_B_1	4224.71	117.665	0.4543	219	219
66	D	L_F_5	8736.61	243.329	0.9394	220	220
66	D	L_F_3	6064.5	168.906	0.6521	221	221
66	D	L_F_1	7079.65	197.18	0.7613	222	222
67	D	L_F_1	1581.38	44.044	0.17	223	223
67	D	L_F_3	7717.41	214.942	0.8298	224	224
68	D	L_B_5	4772.27	132.916	0.5131	225	225
68	D	L_F_2	9069.23	252.593	0.9752	226	226
69	D	L_F_1	5711.95	159.087	0.6142	227	227
69	D	L_B_3	4574.24	127.4	0.4919	228	228
70	D	L_B_3	9079.07	252.867	0.9762	229	229
71	D	L_F_2	7278.81	202.727	0.7827	230	230
71	D	L_B_1	8703.62	242.41	0.9359	231	231
72	D	L_B_2	5977.37	166.48	0.6427	232	232
72	D	L_B_3	8860.42	246.777	0.9527	233	233
72	D	L_F_4	6470.29	180.208	0.6957	234	234
73	D	L_B_3	6923.2	192.822	0.7444	235	235
74	D	L_F_4	8283.25	230.702	0.8907	236	236
74	D	L_F_2	7018.98	195.49	0.7547	237	237
75	D	L_B_4	5190.49	144.563	0.5581	238	238
75	D	L_B_5	8172.68	227.622	0.8788	239	239
76	D	L_F_3	7094.56	197.595	0.7629	240	240
77	D	L_B_3	9012.81	251.021	0.9691	241	241
77	D	L_F_2	4420.56	123.12	0.4753	242	242
77	D	L_B_1	6032.31	168.01	0.6486	243	243
78	D	L_F_1	9049.55	252.044	0.9731	244	244
78	D	L_B_3	8875.54	247.198	0.9544	245	245
79	D	L_B_2	8198.59	228.344	0.8816	246	246
79	D	L_B_3	7209.16	200.787	0.7752	247	247
80	D	L_B_5	2424.93	67.5383	0.2607	248	248
81	D	L_F_5	4112.32	114.535	0.4422	249	249
81	D	L_F_4	390.959	10.8888	0.042	250	250
81	D	L_B_4	3419.85	95.2483	0.3677	251	251
82	D	L_F_1	7831.18	218.111	0.8421	252	252
83	D	L_F_1	6775.72	188.715	0.7286	253	253
83	D	L_B_3	9095.11	253.313	0.978	254	254
83	D	L_F_3	5573.36	155.227	0.5993	255	255
84	D	L_F_3	5980.87	166.577	0.6431	256	256
84	D	L_B_3	6775.31	188.703	0.7285	257	257
85	D	L_B_4	8348.8	232.527	0.8977	258	258
85	D	L_F_3	5704.6	158.882	0.6134	259	259
85	D	L_B_5	9228.39	257.025	0.9923	260	260
86	D	L_B_2	8998.33	250.618	0.9676	261	261
86	D	L_B_3	2828.18	78.7695	0.3041	262	262
86	D	L_F_4	6273.98	174.74	0.6746	263	263
87	D	L_B_4	7236.98	201.562	0.7782	264	264
87	D	L_F_5	8189.37	228.087	0.8806	265	265
88	D	L_B_1	9011.92	250.997	0.969	266	266
88	D	L_F_3	8606.56	239.707	0.9254	267	267
88	D	L_B_5	5584.44	155.536	0.6005	268	268
89	D	L_F_1	3437.7	95.7456	0.3696	269	269
89	D	L_F_4	5520.27	153.748	0.5936	270	270
89	D	L_F_5	5266.19	146.672	0.5663	271	271
90	D	L_F_1	5651.02	157.39	0.6076	272	272
90	D	L_B_4	9038.18	251.728	0.9718	273	273
90	D	L_B_1	5108.49	142.28	0.5493	274	274
91	D	L_B_2	2769.82	77.1439	0.2978	275	275
91	D	L_F_5	5312.47	147.961	0.5712	276	276
91	D	L_B_4	5447.26	151.715	0.5857	277	277
92	D	L_F_3	5762.13	160.485	0.6196	278	278
93	D	L_F_3	4947.72	137.802	0.532	279	279
93	D	L_B_2	6337.78	176.517	0.6815	280	280
93	D	L_F_2	9190.66	255.975	0.9882	281	281
94	D	L_F_5	7135.39	198.732	0.7672	282	282
94	D	L_F_3	5712.91	159.114	0.6143	283	283
95	D	L_B_4	5094.39	141.887	0.5478	284	284
95	D	L_F_2	8130.54	226.449	0.8743	285	285

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
95	D	L_B_1	5453.03	151.876	0.5863	286	286
96	D	L_F_1	9045.21	251.924	0.9726	287	287
96	D	L_B_5	9105.39	253.6	0.9791	288	288
97	D	L_F_5	6053.51	168.6	0.6509	289	289
97	D	L_B_5	3157.7	87.947	0.3395	290	290
98	D	L_F_4	3928.19	109.406	0.4224	291	291
99	D	L_F_5	8727.35	243.071	0.9384	292	292
99	D	L_B_1	7513.56	209.265	0.8079	293	293
99	D	L_B_2	5751.18	160.18	0.6184	294	294
100	D	L_F_2	5762.57	160.497	0.6196	295	295

C.3.19 stochastic_traceability_log_GHS_E.csv

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
1	E	G_C1_L0	7397.62	206.036	0.7954	101	101
1	E	G_C1_L21	9085.34	253.041	0.9769	102	102
1	E	G_C0_L0	9282.11	258.522	0.9981	103	103
1	E	G_C0_L21	5108.71	142.286	0.5493	104	104
1	E	G_C1_L3	8304.99	231.307	0.893	105	105
1	E	G_C2_L0	5456.3	151.967	0.5867	106	106
1	E	G_C2_L4	6653.04	185.298	0.7154	107	107
1	E	G_C1_L2	6857.27	190.986	0.7373	108	108
1	E	G_C2_L2	6622.36	184.443	0.7121	109	109
1	E	L_F_3	3783.09	105.365	0.4068	110	110
1	E	L_B_1	8955.52	249.426	0.963	111	111
2	E	G_C2_L0	5733.42	159.685	0.6165	112	112
2	E	G_C2_L21	7896.19	219.922	0.8491	113	113
2	E	G_C1_L21	6561.32	182.743	0.7055	114	114
2	E	G_C0_L21	7527.45	209.652	0.8094	115	115
2	E	G_C1_L0	7967.78	221.916	0.8568	116	116
2	E	G_C2_L0	8144.04	226.825	0.8757	117	117
2	E	G_C2_L3	5699.91	158.752	0.6129	118	118
2	E	G_C2_L1	7239.56	201.633	0.7784	119	119
2	E	G_C0_L3	4482.12	124.834	0.4819	120	120
2	E	G_C0_L0	7665.7	213.502	0.8243	121	121
2	E	G_C0_L1	6630.96	184.683	0.713	122	122
2	E	L_B_5	4740.87	132.041	0.5098	123	123
2	E	L_B_2	6879.7	191.611	0.7398	124	124
2	E	L_F_1	7446.86	207.407	0.8007	125	125
3	E	G_C0_L0	7636.11	212.678	0.8211	126	126
3	E	G_C1_L0	8016.78	223.28	0.862	127	127
3	E	G_C0_L21	6155.81	171.449	0.6619	128	128
3	E	G_C2_L0	6132.88	170.81	0.6594	129	129
3	E	G_C2_L0	1716.18	47.7984	0.1845	130	130
3	E	G_C2_L1	4452.52	124.01	0.4788	131	131
3	E	G_C2_L2	7272.43	202.549	0.782	132	132
3	E	G_C1_L2	8301.74	231.217	0.8927	133	133
3	E	G_C0_L0	6555.91	182.593	0.7049	134	134
3	E	G_C0_L4	1788.03	49.7994	0.1923	135	135
3	E	G_C0_L1	6879.76	191.613	0.7398	136	136
3	E	D_L_BOT	2672.79	74.4415	0.2874	137	137
3	E	L_F_2	6995.99	194.85	0.7523	138	138
3	E	L_B_4	6374.77	177.548	0.6855	139	139
4	E	G_C1_L21	9199.31	256.216	0.9892	140	140
4	E	G_C1_L0	9060.59	252.352	0.9743	141	141
4	E	G_C2_L1	5667.1	157.838	0.6094	142	142
4	E	G_C1_L4	8195.04	228.245	0.8812	143	143
4	E	G_C2_L2	6395.7	178.131	0.6877	144	144
4	E	G_C2_L3	5119.25	142.579	0.5505	145	145
4	E	G_C1_L2	8255.89	229.94	0.8877	146	146
4	E	L_B_5	8061.83	224.535	0.8669	147	147
4	E	L_B_2	5482.04	152.684	0.5895	148	148
4	E	L_F_2	8374.41	233.241	0.9005	149	149
5	E	G_C2_L21	8049.55	224.193	0.8655	150	150
5	E	G_C1_L21	7668.43	213.578	0.8246	151	151

Iteration_I	Hazard_Zo	Component	Applied_EX	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	ID	MPa	_mm	r_D	T_ID	L_ID
5	E	G_C0_L21	8221.06	228.97	0.884	152	152
5	E	G_C1_L0	7108.53	197.984	0.7644	153	153
5	E	G_C1_L0	6688.16	186.276	0.7192	154	154
5	E	G_C1_L4	6102.77	169.972	0.6562	155	155
5	E	G_C1_L3	9001.44	250.704	0.9679	156	156
5	E	G_C0_L4	4757.83	132.513	0.5116	157	157
5	E	G_C2_L0	8115.47	226.029	0.8726	158	158
5	E	G_C1_L1	3818.17	106.342	0.4106	159	159
5	E	G_C0_L0	6188.61	172.363	0.6654	160	160
5	E	G_C2_L1	4442.11	123.72	0.4776	161	161
5	E	G_C0_L3	512.871	14.2843	0.0551	162	162
5	E	L_B_5	5441.86	151.565	0.5851	163	163
5	E	L_F_5	5756.69	160.333	0.619	164	164
6	E	G_C0_L0	6871.65	191.387	0.7389	165	165
6	E	G_C0_L21	2756.99	76.7866	0.2965	166	166
6	E	G_C2_L21	3813.13	106.202	0.41	167	167
6	E	G_C1_L21	8471.33	235.94	0.9109	168	168
6	E	G_C1_L3	5998.43	167.066	0.645	169	169
6	E	G_C2_L0	7766.42	216.307	0.8351	170	170
6	E	G_C0_L1	3230.85	89.9845	0.3474	171	171
6	E	G_C2_L2	8868.66	247.006	0.9536	172	172
6	E	G_C2_L1	8867.93	246.986	0.9535	173	173
6	E	G_C0_L4	9113.26	253.819	0.9799	174	174
6	E	G_C2_L3	4769.19	132.83	0.5128	175	175
6	E	D_L_BOT	7862.31	218.978	0.8454	176	176
6	E	L_F_2	9229.43	257.055	0.9924	177	177
6	E	L_B_1	5384.18	149.958	0.5789	178	178
6	E	L_F_4	5351.69	149.053	0.5755	179	179
7	E	G_C2_L21	7028.35	195.751	0.7557	180	180
7	E	G_C1_L21	5761.01	160.453	0.6195	181	181
7	E	G_C2_L0	8450.87	235.37	0.9087	182	182
7	E	G_C0_L0	7013.29	195.332	0.7541	183	183
7	E	G_C1_L4	3146.05	87.6225	0.3383	184	184
7	E	G_C2_L1	7082.74	197.266	0.7616	185	185
7	E	G_C2_L0	6285.27	175.055	0.6758	186	186
7	E	G_C1_L0	9297.02	258.937	0.9997	187	187
7	E	G_C2_L4	7488.85	208.576	0.8053	188	188
7	E	D_R_BOT	5703.07	158.84	0.6132	189	189
7	E	L_B_2	7434.92	207.075	0.7995	190	190
7	E	L_F_5	9101.32	253.487	0.9786	191	191
8	E	G_C0_L21	9025.31	251.369	0.9705	192	192
8	E	G_C2_L21	8423.46	234.607	0.9057	193	193
8	E	G_C0_L0	2442.84	68.0371	0.2627	194	194
8	E	G_C0_L3	5337.73	148.664	0.5739	195	195
8	E	G_C1_L2	4732.82	131.817	0.5089	196	196
8	E	G_C2_L3	8439.72	235.06	0.9075	197	197
8	E	G_C0_L4	5913.66	164.705	0.6359	198	198
8	E	G_C2_L4	5219.9	145.382	0.5613	199	199
8	E	G_C1_L3	7106.72	197.934	0.7642	200	200
8	E	D_L_BOT	7974.59	222.105	0.8575	201	201
8	E	L_F_3	5549.07	154.55	0.5967	202	202
8	E	L_B_2	3912.69	108.975	0.4207	203	203
9	E	G_C0_L0	7034.17	195.913	0.7564	204	204
9	E	G_C0_L21	5976.66	166.46	0.6427	205	205
9	E	G_C0_L2	8365.64	232.996	0.8995	206	206
9	E	G_C1_L2	5643.43	157.179	0.6068	207	207
9	E	G_C2_L0	2466.7	68.7016	0.2652	208	208
9	E	G_C1_L4	5159.04	143.688	0.5547	209	209
9	E	G_C0_L4	8695.52	242.184	0.935	210	210
9	E	G_C0_L0	7165.88	199.581	0.7705	211	211
9	E	G_C1_L1	6515.24	181.46	0.7006	212	212
9	E	G_C2_L2	9218.88	256.761	0.9913	213	213
9	E	G_C0_L1	6225.49	173.39	0.6694	214	214
9	E	D_L_BOT	5466.48	152.25	0.5878	215	215
9	E	L_F_3	5957.3	165.92	0.6406	216	216
9	E	L_B_2	8177.63	227.76	0.8793	217	217
10	E	G_C0_L0	8862.68	246.84	0.953	218	218
10	E	G_C1_L0	8478.64	236.144	0.9117	219	219

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
10	E	G_C2_L2	9242.46	257.417	0.9938	220	220
10	E	G_C1_L2	7307.5	203.525	0.7858	221	221
10	E	G_C1_L4	3221.57	89.7259	0.3464	222	222
10	E	G_C2_L1	9187.03	255.874	0.9879	223	223
10	E	G_C1_L3	7834.17	218.194	0.8424	224	224
10	E	G_C2_L3	8540.47	237.866	0.9183	225	225
10	E	L_F_3	4661.35	129.826	0.5012	226	226
10	E	L_F_2	5264	146.611	0.566	227	227
11	E	G_C1_L0	5714.75	159.165	0.6145	228	228
11	E	G_C0_L21	4645.19	129.376	0.4995	229	229
11	E	G_C1_L21	7060.36	196.642	0.7592	230	230
11	E	G_C0_L0	4691.36	130.662	0.5044	231	231
11	E	G_C2_L3	6586.75	183.452	0.7083	232	232
11	E	G_C0_L4	8308.04	231.392	0.8933	233	233
11	E	G_C2_L0	8244.18	229.614	0.8865	234	234
11	E	G_C2_L4	6121.39	170.491	0.6582	235	235
11	E	G_C1_L0	8106.67	225.784	0.8717	236	236
11	E	G_C0_L2	5157.33	143.64	0.5546	237	237
11	E	G_C1_L3	4596.86	128.03	0.4943	238	238
11	E	G_C1_L2	5029.05	140.067	0.5408	239	239
11	E	G_C2_L2	3943.36	109.829	0.424	240	240
11	E	D_R_BOT	5386.63	150.026	0.5792	241	241
11	E	L_F_4	8908.84	248.126	0.9579	242	242
12	E	G_C1_L21	1096.95	30.552	0.118	243	243
12	E	G_C2_L21	8913.34	248.251	0.9584	244	244
12	E	G_C0_L0	9001.88	250.717	0.9679	245	245
12	E	G_C0_L3	5089.12	141.74	0.5472	246	246
12	E	G_C2_L1	7532.18	209.784	0.8099	247	247
12	E	G_C1_L4	8432.35	234.855	0.9067	248	248
12	E	G_C2_L2	8496.31	236.636	0.9136	249	249
12	E	G_C0_L2	7707.18	214.657	0.8287	250	250
12	E	D_L_BOT	1627.02	45.3152	0.1749	251	251
12	E	L_F_5	7089.13	197.444	0.7623	252	252
13	E	G_C2_L21	6381.97	177.748	0.6862	253	253
13	E	G_C2_L0	8297.41	231.096	0.8922	254	254
13	E	G_C1_L0	6806.85	189.582	0.7319	255	255
13	E	G_C2_L1	7944.29	221.261	0.8542	256	256
13	E	G_C0_L3	6673.28	185.862	0.7176	257	257
13	E	G_C1_L3	6037.99	168.168	0.6492	258	258
13	E	G_C0_L1	7233.05	201.452	0.7777	259	259
13	E	L_B_5	8010.07	223.093	0.8613	260	260
14	E	G_C0_L21	3261.73	90.8445	0.3507	261	261
14	E	G_C1_L0	3885.18	108.209	0.4178	262	262
14	E	G_C2_L3	1700.83	47.3709	0.1829	263	263
14	E	G_C2_L4	7939.08	221.116	0.8537	264	264
14	E	G_C0_L0	7530.04	209.724	0.8097	265	265
14	E	G_C1_L0	5828.46	162.332	0.6267	266	266
14	E	G_C2_L1	7187.37	200.18	0.7728	267	267
14	E	G_C0_L2	7741.62	215.617	0.8324	268	268
14	E	G_C1_L2	6497.42	180.964	0.6986	269	269
14	E	G_C0_L4	8957.94	249.493	0.9632	270	270
14	E	G_C0_L3	9208.64	256.475	0.9902	271	271
14	E	L_B_5	8503.84	236.846	0.9144	272	272
15	E	G_C0_L21	5891.3	164.082	0.6335	273	273
15	E	G_C2_L0	6489.15	180.733	0.6978	274	274
15	E	G_C1_L0	6411.46	178.57	0.6894	275	275
15	E	G_C1_L2	8580.88	238.991	0.9227	276	276
15	E	G_C0_L3	6930.41	193.023	0.7452	277	277
15	E	G_C2_L1	7082.82	197.268	0.7616	278	278
15	E	G_C0_L4	6445.87	179.528	0.6931	279	279
15	E	G_C1_L1	3096.33	86.2378	0.3329	280	280
15	E	G_C2_L0	6880.57	191.635	0.7398	281	281
15	E	G_C1_L3	6027.9	167.887	0.6482	282	282
15	E	G_C1_L0	6598.45	183.778	0.7095	283	283
15	E	G_C2_L3	5248.11	146.168	0.5643	284	284
15	E	L_B_4	6856.64	190.968	0.7373	285	285
15	E	L_F_1	3476.86	96.8362	0.3739	286	286
15	E	L_F_3	5179.81	144.266	0.557	287	287

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
16	E	G_C0_L0	5802.71	161.615	0.6239	288	288
16	E	G_C1_L21	6434.1	179.2	0.6918	289	289
16	E	G_C2_L0	2102.88	58.5685	0.2261	290	290
16	E	G_C2_L21	5223.48	145.482	0.5617	291	291
16	E	G_C1_L2	7975.52	222.131	0.8576	292	292
16	E	G_C0_L3	6638.99	184.906	0.7139	293	293
16	E	G_C1_L3	7279.47	202.745	0.7827	294	294
16	E	G_C0_L4	6689.33	186.309	0.7193	295	295
16	E	G_C1_L0	3250.9	90.5429	0.3496	296	296
16	E	G_C0_L1	6123.46	170.548	0.6584	297	297
16	E	G_C0_L2	8086.54	225.223	0.8695	298	298
16	E	L_B_1	6220.28	173.245	0.6688	299	299
16	E	L_B_2	445.569	12.4098	0.0479	300	300
17	E	G_C1_L21	6556.69	182.614	0.705	301	301
17	E	G_C1_L0	8470.27	235.911	0.9108	302	302
17	E	G_C2_L2	5817.29	162.021	0.6255	303	303
17	E	G_C2_L0	7269.54	202.468	0.7817	304	304
17	E	G_C0_L2	1433.68	39.9303	0.1542	305	305
17	E	G_C1_L3	7885.01	219.61	0.8479	306	306
17	E	G_C2_L3	8351.49	232.602	0.898	307	307
17	E	L_B_4	4904.78	136.606	0.5274	308	308
17	E	L_B_2	6812.5	189.739	0.7325	309	309
17	E	L_B_1	7934.12	220.978	0.8531	310	310
18	E	G_C1_L0	7780.48	216.699	0.8366	311	311
18	E	G_C1_L21	8971.77	249.878	0.9647	312	312
18	E	G_C0_L2	4883.3	136.008	0.5251	313	313
18	E	G_C1_L3	8865.75	246.925	0.9533	314	314
18	E	G_C2_L2	1366.74	38.066	0.147	315	315
18	E	G_C2_L1	5009.55	139.524	0.5387	316	316
18	E	G_C2_L4	6072.48	169.128	0.653	317	317
18	E	G_C0_L4	5814.05	161.931	0.6252	318	318
18	E	G_C2_L3	6272.12	174.689	0.6744	319	319
18	E	D_R_BOT	7823.84	217.907	0.8413	320	320
18	E	L_F_5	7613.61	212.051	0.8187	321	321
18	E	L_F_3	7090.35	197.478	0.7624	322	322
19	E	G_C2_L21	7787.16	216.885	0.8373	323	323
19	E	G_C0_L21	7050.5	196.368	0.7581	324	324
19	E	G_C2_L0	5389.72	150.112	0.5795	325	325
19	E	G_C1_L21	6717.52	187.094	0.7223	326	326
19	E	G_C2_L0	6278.74	174.873	0.6751	327	327
19	E	G_C1_L2	5666.73	157.828	0.6093	328	328
19	E	G_C1_L0	9142.14	254.623	0.983	329	329
19	E	G_C1_L1	8049.18	224.183	0.8655	330	330
19	E	G_C2_L2	4555.77	126.885	0.4899	331	331
19	E	L_F_1	6215.31	173.106	0.6683	332	332
19	E	L_F_3	2568.07	71.5248	0.2761	333	333
19	E	L_B_1	8623.52	240.179	0.9273	334	334
20	E	G_C0_L21	8613.2	239.891	0.9262	335	335
20	E	G_C0_L0	7978.45	222.213	0.8579	336	336
20	E	G_C0_L3	8170.95	227.574	0.8786	337	337
20	E	G_C0_L2	4962.84	138.223	0.5336	338	338
20	E	G_C2_L4	7250.86	201.948	0.7797	339	339
20	E	G_C2_L2	7628.42	212.464	0.8203	340	340
20	E	G_C1_L0	7190.25	200.26	0.7731	341	341
20	E	G_C1_L3	4426.16	123.276	0.4759	342	342
20	E	G_C0_L0	8522.1	237.354	0.9164	343	343
20	E	L_F_2	6712.74	186.961	0.7218	344	344
20	E	L_F_1	8681.13	241.783	0.9335	345	345
21	E	G_C0_L21	8655.82	241.079	0.9307	346	346
21	E	G_C2_L21	5642.13	157.143	0.6067	347	347
21	E	G_C0_L0	8332.76	232.081	0.896	348	348
21	E	G_C1_L21	2243.39	62.4819	0.2412	349	349
21	E	G_C0_L0	9260.04	257.907	0.9957	350	350
21	E	G_C1_L0	7458.65	207.736	0.802	351	351
21	E	G_C0_L4	5741.61	159.913	0.6174	352	352
21	E	G_C0_L3	9033.44	251.596	0.9713	353	353
21	E	G_C2_L1	4658.73	129.753	0.5009	354	354
21	E	G_C2_L4	8490.34	236.47	0.9129	355	355

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
21	E	G_C1_L3	6802.29	189.455	0.7314	356	356
21	E	D_R_BOT	4640.7	129.251	0.499	357	357
21	E	L_F_1	6389.21	177.95	0.687	358	358
22	E	G_C0_L0	7963.97	221.809	0.8563	359	359
22	E	G_C1_L0	6677.26	185.972	0.718	360	360
22	E	G_C1_L4	7043.03	196.16	0.7573	361	361
22	E	G_C2_L1	7511.4	209.204	0.8077	362	362
22	E	G_C2_L0	7462.4	207.84	0.8024	363	363
22	E	G_C0_L0	6612.37	184.165	0.711	364	364
22	E	G_C2_L2	9023.36	251.315	0.9703	365	365
22	E	L_B_2	6985.34	194.553	0.7511	366	366
23	E	G_C1_L21	7592.72	211.47	0.8164	367	367
23	E	G_C0_L21	8704.01	242.421	0.9359	368	368
23	E	G_C2_L21	9149.97	254.841	0.9839	369	369
23	E	G_C2_L0	5928.12	165.108	0.6374	370	370
23	E	G_C2_L1	7100.43	197.758	0.7635	371	371
23	E	G_C1_L3	7866.34	219.09	0.8458	372	372
23	E	G_C0_L0	8917.8	248.375	0.9589	373	373
23	E	G_C0_L2	3789.63	105.547	0.4075	374	374
23	E	G_C2_L3	9053.86	252.165	0.9735	375	375
23	E	G_C1_L1	8107.83	225.816	0.8718	376	376
23	E	G_C1_L0	8314.36	231.568	0.894	377	377
23	E	L_F_2	8597.13	239.444	0.9244	378	378
23	E	L_B_5	6372.81	177.493	0.6852	379	379
23	E	L_B_3	4990.82	139.002	0.5366	380	380
24	E	G_C0_L21	7357.56	204.92	0.7911	381	381
24	E	G_C1_L21	9153.24	254.932	0.9842	382	382
24	E	G_C0_L0	8818.72	245.616	0.9482	383	383
24	E	G_C2_L21	8805.19	245.239	0.9468	384	384
24	E	G_C1_L3	8419.64	234.5	0.9053	385	385
24	E	G_C0_L2	4953.47	137.962	0.5326	386	386
24	E	G_C2_L3	6874.72	191.472	0.7392	387	387
24	E	G_C2_L4	7570.88	210.861	0.8141	388	388
24	E	G_C0_L0	6131.86	170.782	0.6593	389	389
24	E	D_L_BOT	8326.89	231.917	0.8954	390	390
24	E	L_F_3	4703.05	130.988	0.5057	391	391
25	E	G_C1_L0	9191.92	256.01	0.9884	392	392
25	E	G_C0_L21	6744.96	187.858	0.7253	393	393
25	E	G_C0_L0	5122.46	142.669	0.5508	394	394
25	E	G_C2_L1	8155.76	227.151	0.877	395	395
25	E	G_C0_L2	6241.83	173.845	0.6712	396	396
25	E	G_C1_L4	8327.54	231.935	0.8954	397	397
25	E	G_C0_L0	5712.35	159.098	0.6142	398	398
25	E	G_C0_L4	8903.02	247.963	0.9573	399	399
25	E	G_C1_L0	3615	100.683	0.3887	400	400
25	E	G_C2_L3	5080.94	141.512	0.5463	401	401
25	E	L_B_1	7128.86	198.55	0.7665	402	402
26	E	G_C1_L0	7118.82	198.271	0.7655	403	403
26	E	G_C1_L21	8939.07	248.967	0.9612	404	404
26	E	G_C2_L1	8703.39	242.404	0.9358	405	405
26	E	G_C2_L0	1365.98	38.0449	0.1469	406	406
26	E	G_C1_L0	6474.59	180.328	0.6962	407	407
26	E	G_C0_L1	4861.28	135.394	0.5227	408	408
26	E	G_C1_L2	8852.23	246.549	0.9519	409	409
26	E	D_R_BOT	2305.37	64.2082	0.2479	410	410
26	E	L_F_3	9221.33	256.829	0.9915	411	411
26	E	L_F_2	7309.77	203.589	0.786	412	412
27	E	G_C1_L0	6698.89	186.575	0.7203	413	413
27	E	G_C0_L21	9185.26	255.824	0.9877	414	414
27	E	G_C0_L0	1830.87	50.9926	0.1969	415	415
27	E	G_C1_L0	8536.48	237.755	0.9179	416	416
27	E	G_C2_L3	4034.99	112.381	0.4339	417	417
27	E	G_C2_L0	5136.45	143.058	0.5523	418	418
27	E	G_C2_L2	3416.87	95.1653	0.3674	419	419
27	E	G_C2_L4	7110.31	198.034	0.7645	420	420
27	E	G_C2_L1	8776.55	244.441	0.9437	421	421
27	E	G_C0_L4	6428.73	179.05	0.6913	422	422
27	E	D_R_BOT	8677.39	241.679	0.9331	423	423

Iteration_I	Hazard_Zo	Component	Applied_EX	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	_ID	MPa	_mm	r_D	T_ID	L_ID
27	E	L_F_2	8951.64	249.318	0.9625	424	424
27	E	L_F_3	8900.88	247.904	0.9571	425	425
28	E	G_C2_L21	5869.73	163.481	0.6312	426	426
28	E	G_C2_L0	6566.63	182.891	0.7061	427	427
28	E	G_C0_L21	7702.97	214.54	0.8283	428	428
28	E	G_C1_L0	8700.1	242.312	0.9355	429	429
28	E	G_C2_L3	8197.2	228.305	0.8814	430	430
28	E	G_C2_L2	7947.43	221.349	0.8546	431	431
28	E	G_C0_L1	9168.33	255.353	0.9858	432	432
28	E	G_C0_L2	6765.61	188.433	0.7275	433	433
28	E	G_C1_L1	2203.56	61.3728	0.2369	434	434
28	E	L_B_4	2212.29	61.6157	0.2379	435	435
28	E	L_B_5	5905.73	164.484	0.635	436	436
29	E	G_C1_L0	5370.97	149.59	0.5775	437	437
29	E	G_C0_L21	6531.37	181.909	0.7023	438	438
29	E	G_C1_L21	1158.62	32.2695	0.1246	439	439
29	E	G_C0_L3	5799.81	161.534	0.6236	440	440
29	E	G_C1_L4	6955.56	193.724	0.7479	441	441
29	E	G_C1_L1	7616.09	212.12	0.8189	442	442
29	E	G_C0_L0	7132.51	198.652	0.7669	443	443
29	E	G_C2_L1	8907.67	248.093	0.9578	444	444
29	E	L_F_1	5258.92	146.47	0.5655	445	445
29	E	L_F_4	3732.73	103.963	0.4014	446	446
29	E	L_B_4	8111.98	225.932	0.8723	447	447
30	E	G_C1_L21	8501.12	236.77	0.9141	448	448
30	E	G_C2_L0	8124.23	226.273	0.8736	449	449
30	E	G_C1_L0	8149.05	226.964	0.8762	450	450
30	E	G_C0_L21	7443.29	207.308	0.8004	451	451
30	E	G_C2_L1	6432.79	179.164	0.6917	452	452
30	E	G_C1_L3	5214.05	145.22	0.5607	453	453
30	E	G_C0_L1	2359.29	65.71	0.2537	454	454
30	E	G_C1_L2	4248.94	118.34	0.4569	455	455
30	E	G_C2_L0	8594.66	239.375	0.9242	456	456
30	E	G_C0_L3	1445.35	40.2553	0.1554	457	457
30	E	D_R_BOT	4684.87	130.481	0.5037	458	458
30	E	L_F_3	9084.88	253.029	0.9769	459	459
30	E	L_B_5	5800.13	161.543	0.6237	460	460
30	E	L_F_2	7245.41	201.796	0.7791	461	461
31	E	G_C2_L21	1511.75	42.1046	0.1626	462	462
31	E	G_C0_L0	6373.46	177.511	0.6853	463	463
31	E	G_C0_L1	7136.22	198.755	0.7673	464	464
31	E	G_C2_L3	7262.51	202.273	0.7809	465	465
31	E	G_C1_L1	5735.97	159.756	0.6168	466	466
31	E	G_C0_L0	1597.51	44.4934	0.1718	467	467
31	E	G_C0_L3	4747.01	132.212	0.5104	468	468
31	E	G_C0_L2	7128.28	198.534	0.7665	469	469
31	E	G_C2_L0	3559.69	99.1432	0.3828	470	470
31	E	G_C2_L2	6774.69	188.686	0.7285	471	471
31	E	G_C2_L1	2428.87	67.648	0.2612	472	472
31	E	L_B_4	6352.47	176.927	0.6831	473	473
31	E	L_F_4	5068.37	141.162	0.545	474	474
31	E	L_B_5	4227.26	117.736	0.4545	475	475
32	E	G_C2_L0	3064.64	85.355	0.3295	476	476
32	E	G_C0_L0	7225.23	201.234	0.7769	477	477
32	E	G_C2_L21	8603.91	239.633	0.9252	478	478
32	E	G_C2_L4	6786.52	189.015	0.7297	479	479
32	E	G_C0_L0	9239.77	257.342	0.9935	480	480
32	E	G_C1_L1	4594.53	127.965	0.494	481	481
32	E	G_C2_L2	8319.13	231.701	0.8945	482	482
32	E	G_C2_L0	8114.98	226.015	0.8726	483	483
32	E	G_C0_L1	8992.23	250.448	0.9669	484	484
32	E	L_F_1	8373.37	233.212	0.9004	485	485
32	E	L_B_2	6256.61	174.257	0.6728	486	486
32	E	L_F_2	5828.69	162.338	0.6267	487	487
33	E	G_C0_L21	6112.75	170.25	0.6573	488	488
33	E	G_C2_L21	4973.78	138.528	0.5348	489	489
33	E	G_C0_L0	5083.69	141.589	0.5466	490	490
33	E	G_C0_L3	6460.61	179.939	0.6947	491	491

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
33	E	G_C2_L3	6123.08	170.538	0.6584	492	492
33	E	G_C1_L0	5355.43	149.157	0.5759	493	493
33	E	G_C2_L2	7350.15	204.714	0.7903	494	494
33	E	G_C2_L0	7402.3	206.166	0.7959	495	495
33	E	D_L_BOT	8112.94	225.958	0.8724	496	496
33	E	L_B_5	6826.13	190.119	0.734	497	497
34	E	G_C1_L0	3424.37	95.3743	0.3682	498	498
34	E	G_C0_L21	8256.84	229.966	0.8878	499	499
34	E	G_C1_L0	3514.69	97.8898	0.3779	500	500
34	E	G_C2_L3	8321.43	231.765	0.8948	501	501
34	E	G_C0_L2	7827.16	217.999	0.8416	502	502
34	E	G_C2_L0	8746.86	243.614	0.9405	503	503
34	E	G_C1_L3	4460.35	124.228	0.4796	504	504
34	E	G_C1_L4	7878.63	219.433	0.8472	505	505
34	E	L_B_2	5902.17	164.385	0.6346	506	506
34	E	L_B_4	1954.33	54.4314	0.2101	507	507
34	E	L_B_1	3950.54	110.029	0.4248	508	508
35	E	G_C1_L0	5446.58	151.696	0.5857	509	509
35	E	G_C1_L21	8460.56	235.64	0.9097	510	510
35	E	G_C2_L0	7145.05	199.001	0.7683	511	511
35	E	G_C1_L1	9114.53	253.854	0.9801	512	512
35	E	G_C0_L4	9290.11	258.744	0.9989	513	513
35	E	G_C2_L2	8122.93	226.237	0.8734	514	514
35	E	G_C1_L4	9211.33	256.55	0.9905	515	515
35	E	D_R_BOT	9246.77	257.538	0.9943	516	516
35	E	L_B_5	7525.13	209.587	0.8092	517	517
35	E	L_F_4	6107.55	170.105	0.6567	518	518
36	E	G_C1_L21	8873.08	247.13	0.9541	519	519
36	E	G_C1_L0	8911.41	248.197	0.9582	520	520
36	E	G_C0_L0	8238.92	229.467	0.8859	521	521
36	E	G_C1_L2	7525	209.583	0.8091	522	522
36	E	G_C2_L0	7626.33	212.406	0.82	523	523
36	E	G_C2_L2	7056.05	196.522	0.7587	524	524
36	E	G_C1_L0	8073.52	224.861	0.8681	525	525
36	E	G_C0_L3	8837.81	246.147	0.9503	526	526
36	E	G_C2_L1	8519.22	237.274	0.916	527	527
36	E	G_C0_L4	5591.82	155.741	0.6013	528	528
36	E	G_C0_L1	7156.27	199.314	0.7695	529	529
36	E	G_C0_L2	7629.05	212.481	0.8203	530	530
36	E	L_B_3	7267.5	202.412	0.7815	531	531
36	E	L_F_1	6646.03	185.103	0.7146	532	532
36	E	L_F_2	4363.75	121.537	0.4692	533	533
37	E	G_C0_L0	7153.01	199.223	0.7691	534	534
37	E	G_C1_L21	9250.79	257.65	0.9947	535	535
37	E	G_C0_L4	8363.54	232.938	0.8993	536	536
37	E	G_C0_L0	5957.4	165.923	0.6406	537	537
37	E	G_C0_L3	6916.01	192.622	0.7437	538	538
37	E	G_C2_L2	6841.03	190.534	0.7356	539	539
37	E	G_C2_L0	7194.1	200.367	0.7736	540	540
37	E	D_R_BOT	6049.06	168.476	0.6504	541	541
37	E	L_F_4	3539.55	98.582	0.3806	542	542
37	E	L_B_5	3100.88	86.3646	0.3334	543	543
37	E	L_F_2	6397.55	178.182	0.6879	544	544
38	E	G_C2_L0	3278.2	91.3031	0.3525	545	545
38	E	G_C0_L0	7907.09	220.225	0.8502	546	546
38	E	G_C1_L4	2210.88	61.5764	0.2377	547	547
38	E	G_C2_L0	5276.67	146.964	0.5674	548	548
38	E	G_C0_L2	6155.78	171.448	0.6619	549	549
38	E	G_C1_L3	9268.95	258.155	0.9967	550	550
38	E	G_C2_L4	6480.07	180.48	0.6968	551	551
38	E	L_B_3	2790.85	77.7298	0.3001	552	552
38	E	L_B_5	2378.27	66.2387	0.2557	553	553
39	E	G_C0_L0	6087.54	169.548	0.6546	554	554
39	E	G_C1_L21	6652.59	185.285	0.7153	555	555
39	E	G_C2_L1	3189.98	88.846	0.343	556	556
39	E	G_C2_L0	4742.16	132.077	0.5099	557	557
39	E	G_C1_L3	7729.65	215.283	0.8311	558	558
39	E	G_C1_L1	7846.89	218.548	0.8438	559	559

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
39	E	G_C2_L4	6121.81	170.502	0.6583	560	560
39	E	G_C0_L3	5338.79	148.694	0.5741	561	561
39	E	G_C1_L4	5586.21	155.585	0.6007	562	562
39	E	G_C0_L4	2523.78	70.2914	0.2714	563	563
39	E	G_C0_L1	3722.75	103.685	0.4003	564	564
39	E	L_B_1	8585.45	239.119	0.9232	565	565
40	E	G_C1_L0	5599.87	155.965	0.6021	566	566
40	E	G_C0_L0	5859.14	163.186	0.63	567	567
40	E	G_C0_L3	7079.21	197.167	0.7612	568	568
40	E	G_C1_L2	5210.65	145.125	0.5603	569	569
40	E	G_C2_L0	7623.37	212.323	0.8197	570	570
40	E	G_C2_L2	5705.55	158.909	0.6135	571	571
40	E	G_C1_L4	7535.13	209.865	0.8102	572	572
40	E	G_C0_L2	6320.29	176.03	0.6796	573	573
40	E	D_R_BOT	8271.36	230.371	0.8894	574	574
40	E	L_F_4	1329.01	37.0151	0.1429	575	575
40	E	L_F_5	4601.62	128.163	0.4948	576	576
41	E	G_C0_L0	6755.56	188.153	0.7264	577	577
41	E	G_C1_L0	8837.54	246.14	0.9503	578	578
41	E	G_C2_L3	6595.33	183.691	0.7092	579	579
41	E	G_C0_L2	6663.24	185.582	0.7165	580	580
41	E	G_C1_L1	7023.19	195.607	0.7552	581	581
41	E	G_C1_L2	8474.83	236.038	0.9113	582	582
41	E	G_C2_L4	6679.14	186.025	0.7182	583	583
41	E	D_L_BOT	1009.8	28.1246	0.1086	584	584
41	E	L_F_1	9230.82	257.093	0.9926	585	585
41	E	L_B_1	602.431	16.7787	0.0648	586	586
42	E	G_C0_L0	7524.97	209.583	0.8091	587	587
42	E	G_C2_L0	5622.67	156.6	0.6046	588	588
42	E	G_C1_L21	6079.27	169.317	0.6537	589	589
42	E	G_C1_L0	5977.7	166.489	0.6428	590	590
42	E	G_C0_L4	5449.29	151.772	0.5859	591	591
42	E	G_C2_L0	4801.76	133.737	0.5163	592	592
42	E	G_C0_L1	8879.69	247.314	0.9548	593	593
42	E	G_C1_L1	9282.73	258.539	0.9981	594	594
42	E	L_B_5	8650.8	240.939	0.9302	595	595
42	E	L_B_2	6699.44	186.59	0.7204	596	596
43	E	G_C2_L21	3487.4	97.1297	0.375	597	597
43	E	G_C0_L0	5873.36	163.582	0.6315	598	598
43	E	G_C2_L1	5952.47	165.786	0.6401	599	599
43	E	G_C1_L1	8850.34	246.496	0.9516	600	600
43	E	G_C1_L0	6257.67	174.286	0.6729	601	601
43	E	G_C0_L3	6471.28	180.236	0.6958	602	602
43	E	G_C0_L4	6988.29	194.635	0.7514	603	603
43	E	G_C2_L2	8885.04	247.463	0.9554	604	604
43	E	G_C1_L3	7378.72	205.509	0.7934	605	605
43	E	G_C0_L0	4532.27	126.231	0.4873	606	606
43	E	D_R_BOT	8158.4	227.225	0.8772	607	607
43	E	L_B_1	5911.27	164.638	0.6356	608	608
43	E	L_F_5	5467.33	152.274	0.5879	609	609
43	E	L_F_3	5192.69	144.625	0.5584	610	610
44	E	G_C2_L21	8493.34	236.553	0.9133	611	611
44	E	G_C1_L0	9156.87	255.034	0.9846	612	612
44	E	G_C0_L0	7280.11	202.763	0.7828	613	613
44	E	G_C1_L21	8236.8	229.408	0.8857	614	614
44	E	G_C1_L0	4016.6	111.869	0.4319	615	615
44	E	G_C1_L1	9034.05	251.613	0.9714	616	616
44	E	G_C2_L4	9242.37	257.415	0.9938	617	617
44	E	G_C2_L2	6340.11	176.582	0.6817	618	618
44	E	G_C0_L4	6239.47	173.779	0.6709	619	619
44	E	G_C0_L3	9083.91	253.002	0.9768	620	620
44	E	G_C0_L1	4426.74	123.292	0.476	621	621
44	E	G_C1_L3	7204.59	200.66	0.7747	622	622
44	E	D_R_BOT	5226.03	145.553	0.5619	623	623
44	E	L_F_1	6709.46	186.869	0.7214	624	624
44	E	L_F_2	7737.06	215.489	0.8319	625	625
45	E	G_C1_L0	7782.66	216.76	0.8368	626	626
45	E	G_C1_L21	2377.18	66.2084	0.2556	627	627

Iteration_I	Hazard_Zo	Component	Applied_EX	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	_ID	MPa	_mm	r_D	T_ID	L_ID
45	E	G_C0_L21	9117.82	253.946	0.9804	628	628
45	E	G_C2_L21	7085.07	197.331	0.7618	629	629
45	E	G_C1_L2	6598.31	183.774	0.7095	630	630
45	E	G_C2_L0	6282.4	174.975	0.6755	631	631
45	E	G_C2_L2	4775.71	133.011	0.5135	632	632
45	E	G_C1_L4	1663.68	46.3362	0.1789	633	633
45	E	G_C0_L2	5202.17	144.889	0.5594	634	634
45	E	G_C2_L1	8938.77	248.959	0.9612	635	635
45	E	G_C1_L1	9079.95	252.891	0.9763	636	636
45	E	G_C1_L3	4259.28	118.628	0.458	637	637
45	E	G_C1_L0	7445.79	207.377	0.8006	638	638
45	E	D_R_BOT	8541.36	237.891	0.9184	639	639
45	E	L_B_1	5989.92	166.829	0.6441	640	640
45	E	L_B_2	2173.37	60.5318	0.2337	641	641
45	E	L_F_2	6529.31	181.852	0.7021	642	642
46	E	G_C1_L21	6862.37	191.128	0.7379	643	643
46	E	G_C1_L0	8202.84	228.462	0.882	644	644
46	E	G_C2_L2	6951.58	193.613	0.7475	645	645
46	E	G_C2_L1	5666.2	157.813	0.6093	646	646
46	E	G_C2_L3	8241.66	229.544	0.8862	647	647
46	E	G_C2_L4	7180.72	199.995	0.7721	648	648
46	E	G_C1_L1	8825.15	245.794	0.9489	649	649
46	E	G_C0_L4	8145.58	226.868	0.8759	650	650
46	E	G_C1_L2	7916.78	220.495	0.8513	651	651
46	E	D_R_BOT	8541.49	237.894	0.9184	652	652
46	E	L_B_3	5156.74	143.624	0.5545	653	653
47	E	G_C1_L0	5045.73	140.532	0.5426	654	654
47	E	G_C2_L21	8234.64	229.348	0.8854	655	655
47	E	G_C0_L0	5881.58	163.811	0.6324	656	656
47	E	G_C0_L1	8174.86	227.683	0.879	657	657
47	E	G_C1_L1	5646.18	157.255	0.6071	658	658
47	E	G_C2_L1	6185.28	172.27	0.6651	659	659
47	E	G_C0_L3	9152.65	254.916	0.9842	660	660
47	E	G_C1_L3	9039.36	251.761	0.972	661	661
47	E	G_C2_L3	5907.04	164.521	0.6352	662	662
47	E	G_C1_L2	4801.85	133.739	0.5163	663	663
47	E	D_R_BOT	8572.51	238.758	0.9218	664	664
47	E	L_B_5	7089.43	197.452	0.7623	665	665
47	E	L_B_4	7225.12	201.231	0.7769	666	666
48	E	G_C0_L21	4661.47	129.829	0.5012	667	667
48	E	G_C2_L0	5373.59	149.663	0.5778	668	668
48	E	G_C1_L21	7398.97	206.073	0.7956	669	669
48	E	G_C0_L0	8963.18	249.639	0.9638	670	670
48	E	G_C1_L0	3815.54	106.269	0.4103	671	671
48	E	G_C1_L3	8156.22	227.164	0.877	672	672
48	E	G_C2_L3	3880	108.064	0.4172	673	673
48	E	G_C2_L4	8514.53	237.143	0.9155	674	674
48	E	G_C0_L3	6788.3	189.065	0.7299	675	675
48	E	G_C0_L4	7272.84	202.56	0.782	676	676
48	E	L_F_3	7396.04	205.992	0.7953	677	677
49	E	G_C2_L21	9274.95	258.322	0.9973	678	678
49	E	G_C2_L0	5899.38	164.307	0.6343	679	679
49	E	G_C0_L21	5402.76	150.476	0.5809	680	680
49	E	G_C2_L3	8355.26	232.708	0.8984	681	681
49	E	G_C2_L0	9121.18	254.04	0.9808	682	682
49	E	G_C2_L1	8540	237.853	0.9183	683	683
49	E	G_C1_L1	4265.93	118.813	0.4587	684	684
49	E	G_C2_L4	7911.52	220.349	0.8507	685	685
49	E	G_C2_L2	6753.19	188.087	0.7261	686	686
49	E	D_L_BOT	4649.62	129.499	0.5	687	687
49	E	L_B_5	2210.49	61.5656	0.2377	688	688
49	E	L_F_4	7139.18	198.838	0.7677	689	689
49	E	L_B_4	7200.49	200.545	0.7742	690	690
50	E	G_C1_L0	8048.55	224.165	0.8654	691	691
50	E	G_C2_L0	4819.32	134.226	0.5182	692	692
50	E	G_C0_L21	3369.54	93.8472	0.3623	693	693
50	E	G_C2_L3	8417.45	234.439	0.9051	694	694
50	E	G_C1_L3	6517.89	181.534	0.7008	695	695

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
50	E	G_C0_L2	7877.31	219.396	0.847	696	696
50	E	G_C1_L0	5481.03	152.655	0.5894	697	697
50	E	G_C2_L0	5533.79	154.125	0.595	698	698
50	E	G_C1_L2	7681.8	213.951	0.826	699	699
50	E	D_L_BOT	2887.65	80.4258	0.3105	700	700
50	E	L_F_1	8620.82	240.104	0.927	701	701
51	E	G_C1_L0	4104.92	114.329	0.4414	702	702
51	E	G_C0_L0	5015.29	139.684	0.5393	703	703
51	E	G_C0_L3	8451.95	235.4	0.9088	704	704
51	E	G_C1_L1	4256.49	118.55	0.4577	705	705
51	E	G_C1_L4	5691.45	158.516	0.612	706	706
51	E	G_C0_L1	9288.7	258.705	0.9988	707	707
51	E	G_C2_L0	8997.38	250.592	0.9675	708	708
51	E	G_C0_L2	6826.14	190.119	0.734	709	709
51	E	D_L_BOT	7861.52	218.956	0.8453	710	710
51	E	L_F_4	4988.53	138.939	0.5364	711	711
51	E	L_F_5	3861.84	107.558	0.4153	712	712
51	E	L_F_2	7903.99	220.139	0.8499	713	713
52	E	G_C2_L0	8716.8	242.777	0.9373	714	714
52	E	G_C1_L21	4360.48	121.447	0.4689	715	715
52	E	G_C0_L0	5492.27	152.968	0.5906	716	716
52	E	G_C1_L3	6839.7	190.497	0.7355	717	717
52	E	G_C0_L3	4394.44	122.392	0.4725	718	718
52	E	G_C2_L0	8432.06	234.847	0.9067	719	719
52	E	G_C1_L1	4203.52	117.075	0.452	720	720
52	E	G_C0_L2	8718.41	242.822	0.9375	721	721
52	E	D_L_BOT	5124.69	142.731	0.551	722	722
52	E	L_B_4	7395.07	205.964	0.7952	723	723
52	E	L_F_3	5544.87	154.434	0.5962	724	724
53	E	G_C0_L21	7879.77	219.464	0.8473	725	725
53	E	G_C2_L0	6487.82	180.696	0.6976	726	726
53	E	G_C2_L21	6775.34	188.704	0.7285	727	727
53	E	G_C1_L1	7713.87	214.844	0.8294	728	728
53	E	G_C0_L4	8825.14	245.794	0.9489	729	729
53	E	G_C1_L0	6507.83	181.254	0.6998	730	730
53	E	G_C0_L0	6843.45	190.601	0.7359	731	731
53	E	G_C0_L1	7363.27	205.079	0.7917	732	732
53	E	G_C1_L4	4650.72	129.53	0.5001	733	733
53	E	G_C0_L2	5066.97	141.123	0.5448	734	734
53	E	G_C2_L0	9051.86	252.109	0.9733	735	735
53	E	D_L_BOT	2949.71	82.1541	0.3172	736	736
53	E	L_F_2	5411.01	150.705	0.5818	737	737
53	E	L_B_3	8862.3	246.829	0.9529	738	738
54	E	G_C2_L21	6744.41	187.843	0.7252	739	739
54	E	G_C0_L21	7207.23	200.733	0.775	740	740
54	E	G_C0_L0	8268.84	230.301	0.8891	741	741
54	E	G_C2_L1	7452.36	207.56	0.8013	742	742
54	E	G_C0_L2	9111.94	253.782	0.9798	743	743
54	E	G_C0_L0	2535.5	70.6179	0.2726	744	744
54	E	G_C2_L2	5091.54	141.808	0.5475	745	745
54	E	G_C1_L1	9168.91	255.369	0.9859	746	746
54	E	G_C2_L4	1626.52	45.3012	0.1749	747	747
54	E	G_C1_L0	8123.91	226.264	0.8735	748	748
54	E	G_C0_L4	4870.18	135.642	0.5237	749	749
54	E	L_F_4	7268.95	202.452	0.7816	750	750
55	E	G_C2_L0	5108.43	142.278	0.5493	751	751
55	E	G_C0_L0	2009.79	55.976	0.2161	752	752
55	E	G_C1_L0	8910.47	248.171	0.9581	753	753
55	E	G_C1_L4	8726.6	243.05	0.9383	754	754
55	E	G_C0_L2	6111.15	170.205	0.6571	755	755
55	E	G_C2_L0	2547.83	70.9611	0.274	756	756
55	E	G_C0_L4	5930.08	165.162	0.6376	757	757
55	E	G_C2_L1	7738.34	215.525	0.8321	758	758
55	E	L_F_3	7923.23	220.675	0.852	759	759
55	E	L_F_2	7202.42	200.599	0.7745	760	760
56	E	G_C0_L21	8321.84	231.777	0.8948	761	761
56	E	G_C2_L21	7617.54	212.161	0.8191	762	762
56	E	G_C0_L0	1202.24	33.4844	0.1293	763	763

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
56	E	G_C2_L0	4289.06	119.457	0.4612	764	764
56	E	G_C0_L0	2259.91	62.9422	0.243	765	765
56	E	G_C2_L4	4605.62	128.274	0.4952	766	766
56	E	G_C1_L4	9150.49	254.856	0.9839	767	767
56	E	G_C0_L1	8686.52	241.934	0.934	768	768
56	E	G_C1_L3	6518.97	181.564	0.701	769	769
56	E	G_C2_L3	3409.82	94.969	0.3666	770	770
56	E	G_C0_L4	8616.87	239.994	0.9265	771	771
56	E	G_C0_L3	8324.18	231.842	0.8951	772	772
56	E	D_R_BOT	4689.55	130.612	0.5043	773	773
56	E	L_F_5	7996.82	222.724	0.8599	774	774
56	E	L_F_2	7271.69	202.528	0.7819	775	775
57	E	G_C1_L21	9182.15	255.738	0.9873	776	776
57	E	G_C1_L0	5164.77	143.847	0.5554	777	777
57	E	G_C0_L0	7799.91	217.24	0.8387	778	778
57	E	G_C0_L0	8099.02	225.571	0.8709	779	779
57	E	G_C0_L3	7291.21	203.072	0.784	780	780
57	E	G_C0_L2	1020.18	28.4137	0.1097	781	781
57	E	G_C0_L1	8757.72	243.917	0.9417	782	782
57	E	G_C2_L0	8813.39	245.467	0.9477	783	783
57	E	D_L_BOT	5292.8	147.413	0.5691	784	784
57	E	L_F_2	8623.74	240.185	0.9273	785	785
57	E	L_F_3	8428.71	234.753	0.9063	786	786
58	E	G_C0_L0	9087.74	253.108	0.9772	787	787
58	E	G_C1_L0	7084.6	197.318	0.7618	788	788
58	E	G_C1_L1	5626.86	156.717	0.605	789	789
58	E	G_C0_L3	5616.77	156.436	0.604	790	790
58	E	G_C0_L0	5985.16	166.696	0.6436	791	791
58	E	G_C2_L1	8602.14	239.583	0.925	792	792
58	E	G_C1_L3	7135.8	198.744	0.7673	793	793
58	E	D_L_BOT	6466.77	180.11	0.6954	794	794
58	E	L_F_3	7202.59	200.604	0.7745	795	795
58	E	L_B_3	6633.36	184.75	0.7133	796	796
59	E	G_C0_L0	4856.28	135.255	0.5222	797	797
59	E	G_C0_L21	3861.76	107.556	0.4152	798	798
59	E	G_C2_L21	5838.74	162.618	0.6278	799	799
59	E	G_C2_L0	7717.31	214.94	0.8298	800	800
59	E	G_C0_L1	6497.19	180.957	0.6986	801	801
59	E	G_C1_L1	7779.4	216.669	0.8365	802	802
59	E	G_C0_L0	8480.39	236.193	0.9119	803	803
59	E	G_C1_L4	8047.45	224.134	0.8653	804	804
59	E	G_C2_L0	3943.86	109.843	0.4241	805	805
59	E	D_R_BOT	8736.29	243.32	0.9394	806	806
59	E	L_B_2	4683.01	130.429	0.5035	807	807
59	E	L_B_3	8450.48	235.359	0.9087	808	808
60	E	G_C2_L0	6637.59	184.868	0.7137	809	809
60	E	G_C1_L21	5469.91	152.346	0.5882	810	810
60	E	G_C1_L0	7135.6	198.738	0.7673	811	811
60	E	G_C0_L0	6842.61	190.578	0.7358	812	812
60	E	G_C0_L0	8830.37	245.94	0.9495	813	813
60	E	G_C1_L1	6900.18	192.181	0.742	814	814
60	E	G_C2_L4	3591.29	100.023	0.3862	815	815
60	E	G_C1_L0	8833.6	246.03	0.9498	816	816
60	E	G_C1_L3	1443.35	40.1997	0.1552	817	817
60	E	G_C0_L3	8062.01	224.54	0.8669	818	818
60	E	D_L_BOT	7864.92	219.051	0.8457	819	819
60	E	L_F_5	6872.4	191.408	0.739	820	820
60	E	L_F_3	8430.19	234.794	0.9065	821	821
60	E	L_F_4	8806.24	245.268	0.9469	822	822
61	E	G_C1_L21	5616.61	156.431	0.6039	823	823
61	E	G_C1_L0	4858.84	135.327	0.5225	824	824
61	E	G_C0_L2	8339.75	232.275	0.8967	825	825
61	E	G_C0_L1	9086.11	253.063	0.977	826	826
61	E	G_C0_L3	7535	209.862	0.8102	827	827
61	E	G_C1_L1	8644.63	240.767	0.9295	828	828
61	E	G_C2_L2	8455.02	235.486	0.9091	829	829
61	E	G_C2_L0	7491.32	208.645	0.8055	830	830
61	E	G_C0_L0	2014.66	56.1114	0.2166	831	831

Iteration_I	Hazard_Zo	Component	Applied_EX_	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	ID	MPa	_mm	r_D	T_ID	L_ID
61	E	G_C1_L4	7280.83	202.783	0.7829	832	832
61	E	L_F_1	7385.77	205.706	0.7942	833	833
61	E	L_B_2	1591.84	44.3354	0.1712	834	834
62	E	G_C1_L21	6660.39	185.503	0.7162	835	835
62	E	G_C0_L21	6746.13	187.891	0.7254	836	836
62	E	G_C2_L0	7087.19	197.39	0.7621	837	837
62	E	G_C0_L0	7340.89	204.456	0.7893	838	838
62	E	G_C2_L2	7424.3	206.779	0.7983	839	839
62	E	G_C0_L2	9295.58	258.897	0.9995	840	840
62	E	G_C1_L0	8691.63	242.076	0.9346	841	841
62	E	G_C0_L1	4915.38	136.901	0.5285	842	842
62	E	G_C0_L4	8850.43	246.499	0.9517	843	843
62	E	G_C2_L1	8751.97	243.756	0.9411	844	844
62	E	G_C1_L3	5115.33	142.47	0.55	845	845
62	E	G_C1_L1	7691.58	214.223	0.8271	846	846
62	E	D_R_BOT	9117.5	253.937	0.9804	847	847
62	E	L_F_2	5630.59	156.821	0.6054	848	848
63	E	G_C0_L21	4048.64	112.761	0.4353	849	849
63	E	G_C1_L21	8585.75	239.127	0.9232	850	850
63	E	G_C2_L0	8006	222.98	0.8609	851	851
63	E	G_C0_L0	6975.37	194.275	0.75	852	852
63	E	G_C1_L1	7234.72	201.499	0.7779	853	853
63	E	G_C0_L2	6034.7	168.076	0.6489	854	854
63	E	G_C2_L2	6145.56	171.164	0.6608	855	855
63	E	G_C1_L0	9143.59	254.664	0.9832	856	856
63	E	G_C2_L1	3450.6	96.1047	0.371	857	857
63	E	G_C0_L3	4641.75	129.28	0.4991	858	858
63	E	G_C2_L0	1836.36	51.1455	0.1975	859	859
63	E	G_C0_L1	6544.63	182.279	0.7037	860	860
63	E	L_B_4	6084.95	169.476	0.6543	861	861
63	E	L_F_3	6054.64	168.631	0.651	862	862
63	E	L_F_2	6642.78	185.012	0.7143	863	863
64	E	G_C1_L0	285.123	7.9411	0.0307	864	864
64	E	G_C2_L0	7536.62	209.907	0.8104	865	865
64	E	G_C2_L3	5462.94	152.152	0.5874	866	866
64	E	G_C1_L1	2446.37	68.1353	0.2631	867	867
64	E	G_C2_L0	4502.78	125.41	0.4842	868	868
64	E	G_C1_L4	7414.29	206.5	0.7972	869	869
64	E	G_C2_L4	4237.81	118.03	0.4557	870	870
64	E	G_C0_L4	6209.09	172.933	0.6676	871	871
64	E	G_C0_L3	2964.36	82.5623	0.3187	872	872
64	E	G_C0_L1	3848.24	107.18	0.4138	873	873
64	E	G_C1_L3	5671.48	157.96	0.6098	874	874
64	E	D_L_BOT	7222.73	201.165	0.7766	875	875
64	E	L_F_2	5786.31	161.158	0.6222	876	876
65	E	G_C0_L0	8963.81	249.657	0.9639	877	877
65	E	G_C0_L21	9185.02	255.818	0.9876	878	878
65	E	G_C2_L1	525.661	14.6405	0.0565	879	879
65	E	G_C2_L0	5424.38	151.078	0.5833	880	880
65	E	G_C0_L4	9261.01	257.934	0.9958	881	881
65	E	G_C1_L3	5756.67	160.333	0.619	882	882
65	E	G_C0_L2	6248.29	174.025	0.6719	883	883
65	E	G_C1_L4	8237.11	229.417	0.8857	884	884
65	E	L_F_3	6728.85	187.409	0.7235	885	885
65	E	L_F_1	8369.75	233.111	0.9	886	886
66	E	G_C2_L0	4306.08	119.931	0.463	887	887
66	E	G_C0_L21	5796.13	161.432	0.6232	888	888
66	E	G_C1_L2	7457.3	207.698	0.8019	889	889
66	E	G_C0_L2	7960.2	221.704	0.8559	890	890
66	E	G_C0_L1	8230.08	229.221	0.885	891	891
66	E	G_C1_L3	8348.49	232.519	0.8977	892	892
66	E	G_C2_L1	5865.31	163.358	0.6307	893	893
66	E	G_C0_L0	8842.27	246.272	0.9508	894	894
66	E	G_C0_L3	4220.92	117.559	0.4539	895	895
66	E	G_C1_L4	8388.35	233.629	0.902	896	896
66	E	G_C2_L0	5009.61	139.526	0.5387	897	897
66	E	L_B_4	2614.24	72.8109	0.2811	898	898
66	E	L_F_4	4547.32	126.65	0.489	899	899

Iteration_I	Hazard_Zo	Component	Applied_EX	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	ID	MPa	_mm	r_D	T_ID	L_ID
67	E	G_C0_L0	9237.63	257.283	0.9933	900	900
67	E	G_C1_L21	6355.29	177.005	0.6834	901	901
67	E	G_C2_L21	7799.13	217.218	0.8386	902	902
67	E	G_C2_L0	5222.24	145.448	0.5615	903	903
67	E	G_C1_L1	8010.87	223.115	0.8614	904	904
67	E	G_C1_L4	8937.22	248.916	0.961	905	905
67	E	G_C1_L2	5154.97	143.574	0.5543	906	906
67	E	G_C2_L0	4588.48	127.796	0.4934	907	907
67	E	G_C0_L0	8823.94	245.761	0.9488	908	908
67	E	G_C1_L3	9168.19	255.349	0.9858	909	909
67	E	G_C0_L3	8372.13	233.178	0.9002	910	910
67	E	G_C2_L1	3366.23	93.755	0.362	911	911
67	E	D_R_BOT	6179.62	172.113	0.6645	912	912
67	E	L_F_4	8010.67	223.11	0.8614	913	913
67	E	L_F_3	4763.97	132.684	0.5123	914	914
67	E	L_B_3	5797.22	161.462	0.6234	915	915
68	E	G_C1_L21	5374.47	149.688	0.5779	916	916
68	E	G_C0_L0	8201.98	228.438	0.8819	917	917
68	E	G_C2_L21	9032.77	251.577	0.9713	918	918
68	E	G_C0_L1	8322.87	231.805	0.8949	919	919
68	E	G_C0_L4	6485.94	180.644	0.6974	920	920
68	E	G_C1_L2	4291.55	119.527	0.4615	921	921
68	E	G_C1_L0	4313	120.124	0.4638	922	922
68	E	G_C1_L3	3958.22	110.243	0.4256	923	923
68	E	D_R_BOT	7227.33	201.293	0.7771	924	924
68	E	L_B_5	7586.15	211.287	0.8157	925	925
68	E	L_F_2	6320.57	176.038	0.6796	926	926
68	E	L_B_4	6874.4	191.463	0.7392	927	927
69	E	G_C2_L21	7124.87	198.439	0.7661	928	928
69	E	G_C0_L0	7308.36	203.55	0.7858	929	929
69	E	G_C0_L21	6122.44	170.52	0.6583	930	930
69	E	G_C1_L21	8666.58	241.378	0.9319	931	931
69	E	G_C2_L3	4767.05	132.77	0.5126	932	932
69	E	G_C0_L0	7654.15	213.18	0.823	933	933
69	E	G_C2_L4	4319.66	120.309	0.4645	934	934
69	E	G_C2_L1	9148.07	254.789	0.9837	935	935
69	E	G_C1_L0	4610.96	128.423	0.4958	936	936
69	E	D_L_BOT	6865.34	191.211	0.7382	937	937
69	E	L_F_3	1877.7	52.2969	0.2019	938	938
70	E	G_C2_L0	7422.96	206.741	0.7982	939	939
70	E	G_C2_L21	2439.99	67.9576	0.2624	940	940
70	E	G_C2_L2	7242.61	201.718	0.7788	941	941
70	E	G_C0_L0	7906.78	220.217	0.8502	942	942
70	E	G_C0_L2	5858.83	163.178	0.63	943	943
70	E	G_C0_L4	1485.95	41.3862	0.1598	944	944
70	E	G_C1_L2	5488.28	152.857	0.5901	945	945
70	E	G_C2_L1	4824.76	134.377	0.5188	946	946
70	E	G_C1_L4	7160.62	199.435	0.77	947	947
70	E	G_C0_L3	7206.28	200.707	0.7749	948	948
70	E	G_C2_L4	7477.36	208.256	0.804	949	949
70	E	L_F_3	5867.35	163.415	0.6309	950	950
70	E	L_F_2	6968.96	194.097	0.7494	951	951
70	E	L_F_5	7246.68	201.832	0.7792	952	952
71	E	G_C1_L0	8433.45	234.885	0.9068	953	953
71	E	G_C0_L21	3411.98	95.0293	0.3669	954	954
71	E	G_C2_L0	8496.28	236.635	0.9136	955	955
71	E	G_C0_L0	6057.2	168.703	0.6513	956	956
71	E	G_C1_L0	64.5016	1.7965	0.0069	957	957
71	E	G_C1_L3	6710.74	186.905	0.7216	958	958
71	E	G_C1_L1	6598.27	183.773	0.7095	959	959
71	E	G_C0_L1	8853.11	246.573	0.9519	960	960
71	E	G_C1_L2	5906.84	164.515	0.6351	961	961
71	E	G_C0_L3	8105.97	225.764	0.8716	962	962
71	E	G_C2_L0	4194.88	116.834	0.4511	963	963
71	E	D_L_BOT	9098.73	253.414	0.9784	964	964
71	E	L_F_5	9092.17	253.232	0.9777	965	965
72	E	G_C0_L0	7076.08	197.08	0.7609	966	966
72	E	G_C2_L0	8827.04	245.847	0.9491	967	967

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
72	E	G_C0_L21	5190.53	144.565	0.5581	968	968
72	E	G_C1_L21	3656.96	101.852	0.3932	969	969
72	E	G_C2_L3	8977.9	250.049	0.9654	970	970
72	E	G_C2_L1	3695.13	102.915	0.3973	971	971
72	E	G_C0_L4	9067.65	252.549	0.975	972	972
72	E	G_C1_L3	9057.43	252.264	0.9739	973	973
72	E	G_C2_L4	6781.05	188.863	0.7291	974	974
72	E	D_R_BOT	6966.19	194.019	0.7491	975	975
72	E	L_F_5	4686.28	130.52	0.5039	976	976
72	E	L_B_2	5513.42	153.558	0.5928	977	977
72	E	L_F_4	4226.59	117.717	0.4545	978	978
73	E	G_C1_L0	8255.54	229.93	0.8877	979	979
73	E	G_C1_L21	5414.22	150.795	0.5822	980	980
73	E	G_C0_L21	2117.91	58.9873	0.2277	981	981
73	E	G_C0_L0	4602.77	128.195	0.4949	982	982
73	E	G_C1_L1	6550.55	182.443	0.7044	983	983
73	E	G_C2_L1	5550.79	154.598	0.5969	984	984
73	E	G_C1_L3	6875.83	191.503	0.7393	985	985
73	E	G_C1_L0	6001.9	167.163	0.6454	986	986
73	E	G_C2_L3	8564.1	238.524	0.9209	987	987
73	E	G_C0_L2	5050.99	140.678	0.5431	988	988
73	E	G_C0_L4	8525.77	237.456	0.9167	989	989
73	E	G_C1_L4	7073.61	197.011	0.7606	990	990
73	E	G_C2_L0	4336.82	120.787	0.4663	991	991
73	E	L_B_2	5092.6	141.837	0.5476	992	992
73	E	L_F_2	6242.74	173.87	0.6713	993	993
74	E	G_C0_L0	6134.59	170.858	0.6596	994	994
74	E	G_C2_L0	7407.46	206.31	0.7965	995	995
74	E	G_C1_L0	7847.6	218.568	0.8438	996	996
74	E	G_C2_L3	6480.15	180.483	0.6968	997	997
74	E	G_C0_L3	7768.97	216.378	0.8354	998	998
74	E	G_C1_L2	5242.98	146.025	0.5638	999	999
74	E	G_C2_L2	7713.31	214.828	0.8294	1000	1000
74	E	G_C0_L0	8601.48	239.565	0.9249	1001	1001
74	E	L_F_1	8809.52	245.359	0.9473	1002	1002
74	E	L_B_3	3527.58	98.2489	0.3793	1003	1003
74	E	L_F_2	8600.73	239.544	0.9248	1004	1004
75	E	G_C2_L21	2417	67.3173	0.2599	1005	1005
75	E	G_C1_L0	7026.24	195.692	0.7555	1006	1006
75	E	G_C0_L21	4009.24	111.664	0.4311	1007	1007
75	E	G_C2_L1	7749.62	215.84	0.8333	1008	1008
75	E	G_C1_L0	7229.02	201.34	0.7773	1009	1009
75	E	G_C0_L4	4080.86	113.659	0.4388	1010	1010
75	E	G_C0_L0	3959.88	110.289	0.4258	1011	1011
75	E	G_C1_L4	6850.81	190.806	0.7366	1012	1012
75	E	G_C0_L2	8746.3	243.599	0.9405	1013	1013
75	E	G_C0_L3	5034.82	140.228	0.5414	1014	1014
75	E	G_C0_L1	4007.92	111.627	0.431	1015	1015
75	E	L_F_3	6245.75	173.954	0.6716	1016	1016
75	E	L_B_4	5795.68	161.419	0.6232	1017	1017
76	E	G_C2_L0	7864.06	219.027	0.8456	1018	1018
76	E	G_C0_L21	9252.75	257.704	0.9949	1019	1019
76	E	G_C2_L21	8989.51	250.372	0.9666	1020	1020
76	E	G_C2_L4	5716.86	159.224	0.6147	1021	1021
76	E	G_C2_L1	8783.62	244.638	0.9445	1022	1022
76	E	G_C1_L0	6508.69	181.278	0.6999	1023	1023
76	E	G_C0_L4	7468.42	208.007	0.8031	1024	1024
76	E	G_C0_L0	6984.14	194.52	0.751	1025	1025
76	E	G_C1_L2	8710.69	242.607	0.9366	1026	1026
76	E	G_C1_L1	7878.8	219.437	0.8472	1027	1027
76	E	G_C2_L3	5708.61	158.994	0.6138	1028	1028
76	E	D_R_BOT	6724.99	187.302	0.7231	1029	1029
76	E	L_F_5	8214.69	228.792	0.8833	1030	1030
76	E	L_F_3	5805.83	161.702	0.6243	1031	1031
77	E	G_C1_L21	3664.73	102.069	0.3941	1032	1032
77	E	G_C1_L0	5586.41	155.59	0.6007	1033	1033
77	E	G_C2_L3	8740.55	243.438	0.9398	1034	1034
77	E	G_C0_L0	5865.15	163.354	0.6307	1035	1035

Iteration_I	Hazard_Zo	Component	Applied_EX	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	_ID	MPa	_mm	r_D	T_ID	L_ID
77	E	G_C0_L3	6188.31	172.354	0.6654	1036	1036
77	E	G_C0_L4	7448.25	207.446	0.8009	1037	1037
77	E	G_C0_L1	8484.4	236.304	0.9123	1038	1038
77	E	D_L_BOT	7863.76	219.018	0.8456	1039	1039
77	E	L_F_2	8863.95	246.875	0.9531	1040	1040
78	E	G_C2_L0	4796.57	133.592	0.5158	1041	1041
78	E	G_C1_L21	5027.24	140.017	0.5406	1042	1042
78	E	G_C1_L0	7986.32	222.432	0.8587	1043	1043
78	E	G_C0_L1	8713.09	242.674	0.9369	1044	1044
78	E	G_C2_L4	8126.98	226.35	0.8739	1045	1045
78	E	G_C1_L3	6965.91	194.012	0.749	1046	1046
78	E	G_C2_L2	5365.55	149.439	0.5769	1047	1047
78	E	G_C1_L0	9066.79	252.525	0.9749	1048	1048
78	E	G_C2_L1	6181.96	172.178	0.6647	1049	1049
78	E	G_C0_L4	8850.61	246.504	0.9517	1050	1050
78	E	D_R_BOT	8981.81	250.158	0.9658	1051	1051
78	E	L_F_1	7053.43	196.449	0.7584	1052	1052
78	E	L_F_2	4155.55	115.739	0.4468	1053	1053
78	E	L_B_5	5924.2	164.999	0.637	1054	1054
79	E	G_C0_L0	7693.51	214.276	0.8273	1055	1055
79	E	G_C0_L21	7882.54	219.542	0.8476	1056	1056
79	E	G_C0_L2	7769.08	216.381	0.8354	1057	1057
79	E	G_C1_L3	8011	223.119	0.8614	1058	1058
79	E	G_C1_L4	7865.31	219.061	0.8457	1059	1059
79	E	G_C2_L4	8682.12	241.811	0.9336	1060	1060
79	E	G_C1_L0	711.517	19.8169	0.0765	1061	1061
79	E	G_C2_L1	5991.86	166.883	0.6443	1062	1062
79	E	G_C2_L3	7605.93	211.838	0.8178	1063	1063
79	E	G_C0_L3	5982.87	166.632	0.6433	1064	1064
79	E	G_C1_L2	8446.61	235.252	0.9082	1065	1065
79	E	D_R_BOT	6428.64	179.048	0.6913	1066	1066
79	E	L_F_5	7940.54	221.157	0.8538	1067	1067
80	E	G_C1_L0	687.715	19.154	0.0739	1068	1068
80	E	G_C0_L21	5826.61	162.28	0.6265	1069	1069
80	E	G_C1_L21	8374.73	233.25	0.9005	1070	1070
80	E	G_C0_L2	5125.05	142.741	0.5511	1071	1071
80	E	G_C1_L1	7477.26	208.254	0.804	1072	1072
80	E	G_C2_L1	8029.61	223.637	0.8634	1073	1073
80	E	G_C2_L4	6075.69	169.218	0.6533	1074	1074
80	E	G_C0_L1	6683.07	186.134	0.7186	1075	1075
80	E	L_B_5	5471.3	152.385	0.5883	1076	1076
81	E	G_C0_L21	5947.72	165.654	0.6395	1077	1077
81	E	G_C2_L0	6490.97	180.784	0.698	1078	1078
81	E	G_C0_L0	1355.3	37.7472	0.1457	1079	1079
81	E	G_C1_L21	6914.67	192.585	0.7435	1080	1080
81	E	G_C0_L0	8453.86	235.454	0.909	1081	1081
81	E	G_C0_L1	4527.88	126.109	0.4869	1082	1082
81	E	G_C1_L2	8278.23	230.562	0.8901	1083	1083
81	E	G_C1_L0	7965.39	221.849	0.8565	1084	1084
81	E	G_C2_L3	5600.44	155.981	0.6022	1085	1085
81	E	G_C2_L1	4634.09	129.067	0.4983	1086	1086
81	E	G_C1_L3	5663.26	157.731	0.609	1087	1087
81	E	D_L_BOT	1364.46	38.0023	0.1467	1088	1088
81	E	L_B_1	7369.38	205.249	0.7924	1089	1089
81	E	L_F_3	8556.06	238.3	0.92	1090	1090
82	E	G_C0_L0	8492.31	236.524	0.9132	1091	1091
82	E	G_C2_L21	7263.76	202.307	0.781	1092	1092
82	E	G_C0_L1	6520.56	181.608	0.7011	1093	1093
82	E	G_C2_L4	5771.22	160.738	0.6206	1094	1094
82	E	G_C2_L3	8517.08	237.214	0.9158	1095	1095
82	E	G_C1_L0	6817.3	189.873	0.733	1096	1096
82	E	G_C0_L4	6734.98	187.58	0.7242	1097	1097
82	E	G_C0_L2	9016.79	251.132	0.9695	1098	1098
82	E	D_L_BOT	6126.31	170.628	0.6587	1099	1099
82	E	L_F_4	7516.01	209.333	0.8082	1100	1100
82	E	L_F_3	9199.95	256.233	0.9892	1101	1101
82	E	L_F_5	6897.42	192.104	0.7417	1102	1102
83	E	G_C1_L0	5200.12	144.832	0.5592	1103	1103

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
83	E	G_C0_L21	8369.61	233.107	0.9	1104	1104
83	E	G_C2_L2	4800.53	133.703	0.5162	1105	1105
83	E	G_C0_L0	6875.38	191.49	0.7393	1106	1106
83	E	G_C0_L2	5270.44	146.79	0.5667	1107	1107
83	E	G_C1_L3	7248.36	201.879	0.7794	1108	1108
83	E	G_C2_L3	9048.21	252.007	0.9729	1109	1109
83	E	G_C1_L2	4165.46	116.015	0.4479	1110	1110
83	E	D_R_BOT	6000.26	167.117	0.6452	1111	1111
83	E	L_B_1	7221.96	201.143	0.7766	1112	1112
83	E	L_F_5	9092.38	253.238	0.9777	1113	1113
84	E	G_C2_L21	7532.45	209.791	0.8099	1114	1114
84	E	G_C0_L21	6592.74	183.619	0.7089	1115	1115
84	E	G_C0_L0	1670.52	46.5268	0.1796	1116	1116
84	E	G_C0_L2	4175.89	116.305	0.449	1117	1117
84	E	G_C0_L4	6309.59	175.732	0.6785	1118	1118
84	E	G_C1_L0	8008.46	223.048	0.8611	1119	1119
84	E	G_C1_L1	5007.49	139.467	0.5384	1120	1120
84	E	G_C2_L0	9264.96	258.044	0.9962	1121	1121
84	E	D_L_BOT	6555.67	182.586	0.7049	1122	1122
84	E	L_F_3	8051.05	224.235	0.8657	1123	1123
84	E	L_B_5	8440	235.068	0.9075	1124	1124
84	E	L_B_4	9239.94	257.347	0.9935	1125	1125
85	E	G_C1_L21	7369.35	205.248	0.7924	1126	1126
85	E	G_C2_L0	4620.99	128.702	0.4969	1127	1127
85	E	G_C0_L21	6401.2	178.284	0.6883	1128	1128
85	E	G_C2_L2	6197.38	172.607	0.6664	1129	1129
85	E	G_C1_L1	7618.86	212.198	0.8192	1130	1130
85	E	G_C2_L4	3171.46	88.3302	0.341	1131	1131
85	E	G_C2_L1	6509.1	181.289	0.6999	1132	1132
85	E	G_C0_L4	7428.03	206.883	0.7987	1133	1133
85	E	G_C1_L2	810.353	22.5696	0.0871	1134	1134
85	E	L_B_5	9089.51	253.157	0.9774	1135	1135
85	E	L_B_2	6381.44	177.733	0.6862	1136	1136
86	E	G_C2_L0	8878.4	247.278	0.9547	1137	1137
86	E	G_C1_L0	4815.54	134.121	0.5178	1138	1138
86	E	G_C2_L4	2907.78	80.9862	0.3127	1139	1139
86	E	G_C2_L1	4082.65	113.709	0.439	1140	1140
86	E	G_C2_L0	3222.12	89.7413	0.3465	1141	1141
86	E	G_C1_L1	6938.96	193.261	0.7461	1142	1142
86	E	G_C0_L3	3270.69	91.0939	0.3517	1143	1143
86	E	G_C0_L2	6381.66	177.739	0.6862	1144	1144
86	E	L_F_1	7267.77	202.419	0.7815	1145	1145
86	E	L_B_4	7968.26	221.929	0.8568	1146	1146
86	E	L_F_5	7466.64	207.958	0.8029	1147	1147
87	E	G_C0_L21	3154.45	87.8566	0.3392	1148	1148
87	E	G_C0_L0	3133.83	87.2823	0.337	1149	1149
87	E	G_C2_L0	6826.77	190.137	0.7341	1150	1150
87	E	G_C0_L1	7587.42	211.322	0.8159	1151	1151
87	E	G_C0_L0	7893.82	219.856	0.8488	1152	1152
87	E	G_C2_L1	4085.58	113.79	0.4393	1153	1153
87	E	G_C1_L4	6831.73	190.275	0.7346	1154	1154
87	E	G_C2_L3	8209.65	228.652	0.8828	1155	1155
87	E	G_C1_L2	7061.18	196.665	0.7593	1156	1156
87	E	G_C0_L3	5593.85	155.798	0.6015	1157	1157
87	E	G_C0_L2	2763.99	76.9817	0.2972	1158	1158
87	E	G_C1_L0	6581.09	183.294	0.7076	1159	1159
87	E	D_L_BOT	4031.57	112.286	0.4335	1160	1160
87	E	L_B_2	7203.25	200.622	0.7745	1161	1161
88	E	G_C0_L0	8762.21	244.042	0.9422	1162	1162
88	E	G_C2_L21	4663.58	129.888	0.5015	1163	1163
88	E	G_C1_L21	9003.35	250.758	0.9681	1164	1164
88	E	G_C2_L0	4093.72	114.017	0.4402	1165	1165
88	E	G_C0_L4	9126.83	254.197	0.9814	1166	1166
88	E	G_C2_L4	8262.14	230.114	0.8884	1167	1167
88	E	G_C2_L3	8220.86	228.964	0.884	1168	1168
88	E	G_C0_L1	1476.03	41.1099	0.1587	1169	1169
88	E	G_C0_L3	4061.59	113.122	0.4367	1170	1170
88	E	G_C1_L3	7331.8	204.202	0.7884	1171	1171

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
88	E	L_F_3	6237.79	173.733	0.6707	1172	1172
89	E	G_C1_L21	7613.77	212.056	0.8187	1173	1173
89	E	G_C0_L21	6784.42	188.957	0.7295	1174	1174
89	E	G_C2_L4	7614.47	212.075	0.8188	1175	1175
89	E	G_C1_L4	4841.35	134.839	0.5206	1176	1176
89	E	G_C0_L3	5109.64	142.312	0.5494	1177	1177
89	E	G_C1_L1	8933.01	248.799	0.9605	1178	1178
89	E	G_C1_L3	5349.35	148.988	0.5752	1179	1179
89	E	G_C2_L3	8737.62	243.357	0.9395	1180	1180
89	E	G_C0_L1	7590.84	211.417	0.8162	1181	1181
89	E	G_C0_L4	9248.51	257.586	0.9945	1182	1182
89	E	D_R_BOT	7886.67	219.657	0.848	1183	1183
89	E	L_B_2	4653.34	129.603	0.5004	1184	1184
90	E	G_C1_L0	5284.5	147.182	0.5682	1185	1185
90	E	G_C0_L21	7357.18	204.91	0.7911	1186	1186
90	E	G_C2_L0	6495.45	180.909	0.6984	1187	1187
90	E	G_C2_L21	8415.76	234.392	0.9049	1188	1188
90	E	G_C0_L3	9247.74	257.565	0.9944	1189	1189
90	E	G_C1_L1	5254.2	146.338	0.565	1190	1190
90	E	G_C2_L3	9134.43	254.409	0.9822	1191	1191
90	E	G_C0_L0	6686.35	186.226	0.719	1192	1192
90	E	G_C2_L1	5979.55	166.54	0.643	1193	1193
90	E	G_C0_L1	1391.9	38.7667	0.1497	1194	1194
90	E	G_C2_L2	6288.04	175.132	0.6761	1195	1195
90	E	D_L_BOT	6391.23	178.006	0.6872	1196	1196
90	E	L_F_5	4446.65	123.847	0.4781	1197	1197
90	E	L_B_2	6279.78	174.902	0.6752	1198	1198
90	E	L_B_4	7931.52	220.906	0.8529	1199	1199
91	E	G_C2_L0	7022.64	195.592	0.7551	1200	1200
91	E	G_C1_L21	5217.66	145.32	0.561	1201	1201
91	E	G_C1_L1	9033.4	251.595	0.9713	1202	1202
91	E	G_C2_L4	4425.29	123.251	0.4758	1203	1203
91	E	G_C2_L3	6383.91	177.802	0.6864	1204	1204
91	E	G_C2_L0	7273.42	202.577	0.7821	1205	1205
91	E	G_C0_L0	8445	235.207	0.9081	1206	1206
91	E	G_C2_L2	8948.51	249.231	0.9622	1207	1207
91	E	G_C0_L1	5594.31	155.811	0.6015	1208	1208
91	E	G_C1_L2	6066.02	168.948	0.6523	1209	1209
91	E	D_L_BOT	5238.67	145.905	0.5633	1210	1210
91	E	L_B_5	1400.5	39.0062	0.1506	1211	1211
91	E	L_F_5	8873.85	247.151	0.9542	1212	1212
92	E	G_C2_L0	8992.83	250.465	0.967	1213	1213
92	E	G_C1_L21	7490.13	208.612	0.8054	1214	1214
92	E	G_C0_L0	7367.78	205.204	0.7922	1215	1215
92	E	G_C2_L1	6260.51	174.365	0.6732	1216	1216
92	E	G_C0_L4	6059.48	168.766	0.6516	1217	1217
92	E	G_C0_L1	9159.49	255.107	0.9849	1218	1218
92	E	G_C1_L0	3816.74	106.302	0.4104	1219	1219
92	E	G_C2_L0	7850.67	218.654	0.8442	1220	1220
92	E	G_C2_L3	7491.41	208.648	0.8055	1221	1221
92	E	L_F_3	4190.55	116.714	0.4506	1222	1222
93	E	G_C0_L21	8664.33	241.316	0.9316	1223	1223
93	E	G_C2_L21	5864.98	163.349	0.6306	1224	1224
93	E	G_C1_L3	7415.84	206.543	0.7974	1225	1225
93	E	G_C2_L1	2741.83	76.3645	0.2948	1226	1226
93	E	G_C2_L4	196.652	5.4771	0.0211	1227	1227
93	E	G_C1_L0	1329.22	37.0209	0.1429	1228	1228
93	E	G_C2_L0	4977	138.618	0.5352	1229	1229
93	E	G_C0_L2	8436.86	234.98	0.9072	1230	1230
93	E	G_C1_L4	7760.37	216.139	0.8344	1231	1231
93	E	G_C0_L3	8534.33	237.695	0.9177	1232	1232
93	E	G_C0_L1	4372.43	121.779	0.4702	1233	1233
93	E	D_L_BOT	6759.4	188.26	0.7268	1234	1234
93	E	L_B_3	8397.56	233.886	0.903	1235	1235
94	E	G_C1_L21	7019.5	195.504	0.7548	1236	1236
94	E	G_C0_L0	4675.24	130.213	0.5027	1237	1237
94	E	G_C1_L0	9164.64	255.25	0.9854	1238	1238
94	E	G_C2_L21	4539.17	126.423	0.4881	1239	1239

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
94	E	G_C2_L3	4912.86	136.831	0.5283	1240	1240
94	E	G_C0_L2	5705.31	158.902	0.6135	1241	1241
94	E	G_C2_L2	5408.62	150.639	0.5816	1242	1242
94	E	G_C0_L3	4778.25	133.082	0.5138	1243	1243
94	E	G_C0_L4	8330.36	232.014	0.8957	1244	1244
94	E	G_C2_L0	8134.39	226.556	0.8747	1245	1245
94	E	G_C1_L4	5772.96	160.786	0.6207	1246	1246
94	E	G_C2_L1	7287.67	202.973	0.7836	1247	1247
94	E	G_C1_L3	2795.92	77.8708	0.3006	1248	1248
94	E	L_F_2	7961.55	221.742	0.8561	1249	1249
94	E	L_B_3	5009.83	139.532	0.5387	1250	1250
95	E	G_C1_L0	7681.5	213.942	0.826	1251	1251
95	E	G_C2_L21	4177.3	116.344	0.4492	1252	1252
95	E	G_C1_L0	6229.73	173.508	0.6699	1253	1253
95	E	G_C1_L4	7475.87	208.215	0.8039	1254	1254
95	E	G_C1_L2	3762.45	104.79	0.4046	1255	1255
95	E	G_C0_L4	6223.89	173.345	0.6692	1256	1256
95	E	G_C1_L1	6428.19	179.036	0.6912	1257	1257
95	E	G_C0_L3	2624.69	73.1018	0.2822	1258	1258
95	E	G_C0_L2	7757.93	216.071	0.8342	1259	1259
95	E	G_C2_L0	5882.19	163.828	0.6325	1260	1260
95	E	L_F_5	4316.33	120.217	0.4641	1261	1261
96	E	G_C0_L21	7531.41	209.762	0.8098	1262	1262
96	E	G_C1_L21	6913.95	192.565	0.7434	1263	1263
96	E	G_C0_L0	8383.07	233.482	0.9014	1264	1264
96	E	G_C0_L4	4504.92	125.469	0.4844	1265	1265
96	E	G_C1_L0	6330.6	176.317	0.6807	1266	1266
96	E	G_C1_L4	8819.67	245.642	0.9484	1267	1267
96	E	G_C0_L1	6102.81	169.973	0.6562	1268	1268
96	E	G_C1_L1	5950.11	165.72	0.6398	1269	1269
96	E	G_C0_L2	5325.68	148.329	0.5727	1270	1270
96	E	D_R_BOT	2597.17	72.3354	0.2793	1271	1271
96	E	L_B_2	6307.99	175.688	0.6783	1272	1272
97	E	G_C2_L0	8359.17	232.816	0.8988	1273	1273
97	E	G_C2_L21	7536.54	209.905	0.8104	1274	1274
97	E	G_C0_L3	2584.46	71.9814	0.2779	1275	1275
97	E	G_C2_L0	8006.68	222.999	0.8609	1276	1276
97	E	G_C1_L2	3931.76	109.506	0.4228	1277	1277
97	E	G_C1_L4	8799.07	245.068	0.9461	1278	1278
97	E	G_C0_L2	6994.67	194.813	0.7521	1279	1279
97	E	D_R_BOT	6011.35	167.426	0.6464	1280	1280
97	E	L_F_5	8646.45	240.817	0.9297	1281	1281
98	E	G_C2_L0	5849.37	162.914	0.629	1282	1282
98	E	G_C2_L21	6012.6	167.46	0.6465	1283	1283
98	E	G_C0_L0	4042.05	112.578	0.4346	1284	1284
98	E	G_C1_L3	9047.5	251.987	0.9728	1285	1285
98	E	G_C2_L2	4056.37	112.977	0.4362	1286	1286
98	E	G_C1_L1	8688.92	242	0.9343	1287	1287
98	E	G_C1_L4	6079.59	169.327	0.6537	1288	1288
98	E	L_B_1	8454.84	235.481	0.9091	1289	1289
98	E	L_B_3	7740.91	215.597	0.8324	1290	1290
99	E	G_C0_L0	2243.07	62.473	0.2412	1291	1291
99	E	G_C2_L0	9248.27	257.579	0.9944	1292	1292
99	E	G_C1_L4	8633.64	240.461	0.9283	1293	1293
99	E	G_C0_L1	4407.36	122.752	0.4739	1294	1294
99	E	G_C0_L4	8521.74	237.344	0.9163	1295	1295
99	E	G_C2_L4	8448.93	235.316	0.9085	1296	1296
99	E	G_C2_L0	4820.17	134.25	0.5183	1297	1297
99	E	G_C1_L3	8178.73	227.791	0.8794	1298	1298
99	E	D_R_BOT	2588.26	72.0872	0.2783	1299	1299
99	E	L_B_3	5346.02	148.895	0.5748	1300	1300
99	E	L_F_5	1861.63	51.8495	0.2002	1301	1301
100	E	G_C0_L0	8369.23	233.096	0.8999	1302	1302
100	E	G_C2_L0	7762.79	216.206	0.8347	1303	1303
100	E	G_C2_L2	8120.72	226.175	0.8732	1304	1304
100	E	G_C2_L4	4148.31	115.537	0.4461	1305	1305
100	E	G_C2_L3	5734.86	159.725	0.6167	1306	1306
100	E	G_C1_L3	8864.84	246.9	0.9532	1307	1307

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
100	E	G_C1_L4	6171.92	171.898	0.6636	1308	1308
100	E	G_C1_L1	4737.9	131.958	0.5095	1309	1309
100	E	G_C1_L0	3859.77	107.501	0.415	1310	1310
100	E	G_C0_L2	7787.41	216.892	0.8374	1311	1311
100	E	G_C0_L0	7307.1	203.515	0.7857	1312	1312
100	E	D_L_BOT	4878.14	135.864	0.5245	1313	1313
100	E	L_F_2	6175.12	171.987	0.664	1314	1314

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Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
1	A	G_C2_L0	7022.4	195.585	0.2265	0.7551	0.7551
1	A	G_C0_L21	7288.96	203.009	0.2351	0.7838	0.7838
1	A	G_C1_L21	6940.57	193.306	0.2239	0.7463	0.7463
1	A	G_C1_L0	2446.25	68.1321	0.0789	0.263	0.263
2	A	G_C0_L21	6668.58	185.731	0.2151	0.7171	0.7171
2	A	G_C2_L0	4696.8	130.814	0.1515	0.505	0.505
2	A	G_C2_L21	4132.33	115.092	0.1333	0.4443	0.4443
3	A	G_C2_L21	9225.9	256.956	0.2976	0.992	0.992
3	A	G_C2_L0	5006.7	139.445	0.1615	0.5384	0.5384
3	A	G_C0_L21	8833.3	246.022	0.2849	0.9498	0.9498
3	A	G_C1_L0	8337.26	232.206	0.2689	0.8965	0.8965
4	A	G_C0_L0	4445.48	123.814	0.1434	0.478	0.478
4	A	G_C1_L21	5049.24	140.629	0.1629	0.5429	0.5429
4	A	G_C0_L21	4799.8	133.682	0.1548	0.5161	0.5161
4	A	G_C2_L21	6309.7	175.735	0.2035	0.6785	0.6785
5	A	G_C0_L0	2366.86	65.921	0.0764	0.2545	0.2545
5	A	G_C1_L21	5900.34	164.334	0.1903	0.6344	0.6344
5	A	G_C2_L21	7882.65	219.544	0.2543	0.8476	0.8476
5	A	G_C0_L21	6436.18	179.258	0.2076	0.6921	0.6921
6	A	G_C2_L21	3486.29	97.0988	0.1125	0.3749	0.3749
6	A	G_C2_L0	7867.8	219.131	0.2538	0.846	0.846
6	A	G_C0_L21	5466.15	152.241	0.1763	0.5878	0.5878
7	A	G_C0_L21	6093.67	169.719	0.1966	0.6552	0.6552
7	A	G_C2_L21	4929.1	137.283	0.159	0.53	0.53
7	A	G_C1_L21	7818.86	217.768	0.2522	0.8407	0.8407
7	A	G_C0_L0	7140.95	198.887	0.2304	0.7678	0.7678
8	A	G_C0_L21	6454.56	179.77	0.2082	0.694	0.694
8	A	G_C2_L21	5737.95	159.811	0.1851	0.617	0.617
8	A	G_C2_L0	3236.51	90.142	0.1044	0.348	0.348
9	A	G_C1_L0	6405.28	178.397	0.2066	0.6887	0.6887
9	A	G_C0_L21	8437.18	234.989	0.2722	0.9072	0.9072
9	A	G_C2_L0	8136.69	226.62	0.2625	0.8749	0.8749
10	A	G_C1_L0	7380.48	205.558	0.2381	0.7936	0.7936
10	A	G_C0_L21	4315.25	120.187	0.1392	0.464	0.464
10	A	G_C0_L0	9023.3	251.314	0.2911	0.9702	0.9702
10	A	G_C2_L0	9147.5	254.773	0.2951	0.9836	0.9836
11	A	G_C1_L0	2912.02	81.1044	0.0939	0.3131	0.3131
11	A	G_C2_L0	8151.35	227.028	0.2629	0.8765	0.8765
11	A	G_C0_L21	7925.2	220.73	0.2557	0.8522	0.8522
12	A	G_C0_L21	9126.11	254.177	0.2944	0.9813	0.9813
12	A	G_C1_L21	9281.26	258.498	0.2994	0.998	0.998
12	A	G_C2_L21	6972.15	194.186	0.2249	0.7497	0.7497
12	A	G_C0_L0	6768.91	188.525	0.2184	0.7278	0.7278
13	A	G_C1_L0	5409.75	150.67	0.1745	0.5817	0.5817
13	A	G_C1_L21	6609.93	184.097	0.2132	0.7107	0.7107
14	A	G_C1_L21	5262.38	146.566	0.1698	0.5658	0.5658
14	A	G_C2_L21	6274.09	174.744	0.2024	0.6746	0.6746
14	A	G_C0_L0	7122.33	198.368	0.2298	0.7658	0.7658
14	A	G_C2_L0	4838.71	134.766	0.1561	0.5203	0.5203
15	A	G_C1_L21	2637.26	73.4519	0.0851	0.2836	0.2836
15	A	G_C1_L0	6191.67	172.448	0.1997	0.6658	0.6658
15	A	G_C2_L21	7195.75	200.413	0.2321	0.7737	0.7737
15	A	G_C0_L0	4059.09	113.052	0.1309	0.4365	0.4365
16	A	G_C2_L21	7431.06	206.967	0.2397	0.799	0.799

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	mm	N_m3	m_m	or_D
16	A	G_C2_L0	6612.85	184.179	0.2133	0.7111	0.7111
17	A	G_C2_L0	1946.28	54.2072	0.0628	0.2093	0.2093
17	A	G_C1_L21	7230.37	201.377	0.2332	0.7775	0.7775
18	A	G_C0_L0	3888.47	108.3	0.1254	0.4181	0.4181
18	A	G_C2_L0	7635.73	212.667	0.2463	0.821	0.821
18	A	G_C2_L21	4541.73	126.495	0.1465	0.4884	0.4884
19	A	G_C0_L0	2572.45	71.647	0.083	0.2766	0.2766
19	A	G_C2_L21	9273.05	258.269	0.2991	0.9971	0.9971
19	A	G_C2_L0	2978.12	82.9455	0.0961	0.3202	0.3202
19	A	G_C0_L21	4894.76	136.327	0.1579	0.5263	0.5263
20	A	G_C1_L21	5569.54	155.121	0.1797	0.5989	0.5989
20	A	G_C2_L21	4872.37	135.703	0.1572	0.5239	0.5239
21	A	G_C0_L0	4179.22	116.398	0.1348	0.4494	0.4494
21	A	G_C1_L0	8533.12	237.661	0.2753	0.9175	0.9175
21	A	G_C0_L21	9039.4	251.762	0.2916	0.972	0.972
21	A	G_C1_L21	6118.67	170.415	0.1974	0.6579	0.6579
22	A	G_C1_L0	6963.04	193.932	0.2246	0.7487	0.7487
22	A	G_C2_L0	7398.85	206.07	0.2387	0.7956	0.7956
23	A	G_C2_L0	3451.65	96.134	0.1113	0.3711	0.3711
23	A	G_C1_L0	6696.18	186.499	0.216	0.72	0.72
23	A	G_C2_L21	5975.27	166.421	0.1928	0.6425	0.6425
23	A	G_C0_L21	3812	106.17	0.123	0.4099	0.4099
24	A	G_C0_L0	6047.24	168.425	0.1951	0.6502	0.6502
24	A	G_C2_L0	5005.83	139.421	0.1615	0.5383	0.5383
25	A	G_C1_L21	9138.22	254.514	0.2948	0.9826	0.9826
25	A	G_C0_L21	7640.71	212.806	0.2465	0.8216	0.8216
25	A	G_C1_L0	3786.14	105.45	0.1221	0.4071	0.4071
26	A	G_C1_L0	6206.06	172.849	0.2002	0.6673	0.6673
26	A	G_C1_L21	4922.77	137.107	0.1588	0.5293	0.5293
27	A	G_C1_L21	7817.74	217.737	0.2522	0.8406	0.8406
27	A	G_C1_L0	6901.95	192.231	0.2226	0.7421	0.7421
28	A	G_C2_L21	5509.45	153.447	0.1777	0.5924	0.5924
28	A	G_C2_L0	9026.25	251.396	0.2912	0.9706	0.9706
29	A	G_C2_L21	7441.23	207.25	0.24	0.8001	0.8001
29	A	G_C2_L0	8704.6	242.437	0.2808	0.936	0.936
30	A	G_C2_L0	7436.38	207.115	0.2399	0.7996	0.7996
30	A	G_C2_L21	9029.3	251.481	0.2913	0.9709	0.9709
30	A	G_C0_L21	5944.81	165.572	0.1918	0.6392	0.6392
31	A	G_C1_L21	6452.75	179.72	0.2082	0.6938	0.6938
31	A	G_C0_L0	4141.15	115.338	0.1336	0.4453	0.4453
31	A	G_C2_L0	8294.16	231.006	0.2676	0.8918	0.8918
32	A	G_C1_L0	6546.46	182.329	0.2112	0.7039	0.7039
32	A	G_C0_L21	4579.13	127.536	0.1477	0.4924	0.4924
33	A	G_C1_L0	7636.97	212.702	0.2464	0.8212	0.8212
33	A	G_C1_L21	5986.02	166.72	0.1931	0.6437	0.6437
33	A	G_C0_L0	7430.11	206.94	0.2397	0.7989	0.7989
34	A	G_C0_L0	5720.76	159.332	0.1845	0.6151	0.6151
34	A	G_C2_L21	5789.09	161.236	0.1867	0.6225	0.6225
35	A	G_C2_L0	8509.92	237.015	0.2745	0.915	0.915
35	A	G_C0_L21	6753.06	188.084	0.2178	0.7261	0.7261
35	A	G_C0_L0	3703.84	103.158	0.1195	0.3983	0.3983
35	A	G_C1_L0	8268.14	230.281	0.2667	0.889	0.889
36	A	G_C1_L21	8401.49	233.995	0.271	0.9034	0.9034
36	A	G_C0_L0	5084.52	141.612	0.164	0.5467	0.5467
37	A	G_C1_L21	8675.61	241.63	0.2799	0.9329	0.9329
37	A	G_C2_L0	7136.81	198.772	0.2302	0.7674	0.7674
37	A	G_C0_L21	8452.91	235.427	0.2727	0.9089	0.9089
37	A	G_C1_L0	5713.97	159.143	0.1843	0.6144	0.6144
38	A	G_C2_L0	8954.58	249.399	0.2889	0.9629	0.9629
38	A	G_C0_L0	6793.51	189.21	0.2191	0.7305	0.7305
39	A	G_C0_L21	8880.32	247.331	0.2865	0.9549	0.9549
39	A	G_C1_L21	7656.64	213.25	0.247	0.8233	0.8233
40	A	G_C2_L21	8707.9	242.529	0.2809	0.9363	0.9363
40	A	G_C1_L0	5211.14	145.139	0.1681	0.5603	0.5603
40	A	G_C2_L0	4608.48	128.353	0.1487	0.4955	0.4955
41	A	G_C1_L21	7127.94	198.525	0.2299	0.7664	0.7664
41	A	G_C1_L0	6356.53	177.04	0.205	0.6835	0.6835
41	A	G_C2_L0	5154.73	143.567	0.1663	0.5543	0.5543

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
41	A	G_C0_L21	7320.71	203.893	0.2362	0.7872	0.7872
42	A	G_C2_L21	3351.44	93.343	0.1081	0.3604	0.3604
42	A	G_C0_L21	4801.87	133.74	0.1549	0.5163	0.5163
43	A	G_C2_L21	4008.28	111.637	0.1293	0.431	0.431
43	A	G_C0_L21	3724.87	103.744	0.1202	0.4005	0.4005
43	A	G_C2_L0	8579.73	238.959	0.2768	0.9226	0.9226
43	A	G_C1_L0	7138.69	198.824	0.2303	0.7676	0.7676
44	A	G_C0_L0	8823.54	245.75	0.2846	0.9488	0.9488
44	A	G_C2_L21	7803.65	217.344	0.2517	0.8391	0.8391
45	A	G_C0_L21	7825.93	217.965	0.2524	0.8415	0.8415
45	A	G_C1_L0	6893.19	191.986	0.2224	0.7412	0.7412
45	A	G_C1_L21	9218.03	256.737	0.2974	0.9912	0.9912
46	A	G_C0_L0	7311.57	203.639	0.2359	0.7862	0.7862
46	A	G_C0_L21	7535.2	209.868	0.2431	0.8102	0.8102
46	A	G_C2_L21	8465.84	235.787	0.2731	0.9103	0.9103
46	A	G_C2_L0	8743.01	243.507	0.282	0.9401	0.9401
47	A	G_C2_L21	6931.07	193.041	0.2236	0.7453	0.7453
47	A	G_C1_L0	4770.71	132.872	0.1539	0.513	0.513
47	A	G_C2_L0	7448.13	207.442	0.2403	0.8009	0.8009
47	A	G_C0_L21	8641.06	240.667	0.2787	0.9291	0.9291
48	A	G_C1_L0	9130.26	254.292	0.2945	0.9817	0.9817
48	A	G_C0_L0	7674.72	213.753	0.2476	0.8252	0.8252
49	A	G_C1_L0	5466.12	152.24	0.1763	0.5878	0.5878
49	A	G_C2_L0	6927.77	192.949	0.2235	0.7449	0.7449
49	A	G_C0_L21	4003.8	111.512	0.1292	0.4305	0.4305
49	A	G_C1_L21	4019.92	111.961	0.1297	0.4322	0.4322
50	A	G_C0_L0	2004.72	55.8348	0.0647	0.2156	0.2156
50	A	G_C1_L21	4861.82	135.41	0.1568	0.5228	0.5228
51	A	G_C0_L21	1718.23	47.8556	0.0554	0.1848	0.1848
51	A	G_C0_L0	5121.78	142.65	0.1652	0.5507	0.5507
52	A	G_C2_L0	5352.9	149.087	0.1727	0.5756	0.5756
52	A	G_C0_L0	8611.16	239.835	0.2778	0.9259	0.9259
53	A	G_C0_L21	9238.4	257.304	0.298	0.9934	0.9934
53	A	G_C1_L0	6651.73	185.261	0.2146	0.7152	0.7152
54	A	G_C0_L0	7590.65	211.412	0.2449	0.8162	0.8162
54	A	G_C1_L21	8782.79	244.615	0.2833	0.9444	0.9444
54	A	G_C0_L21	6443.35	179.458	0.2079	0.6928	0.6928
54	A	G_C2_L0	7812.02	217.577	0.252	0.84	0.84
55	A	G_C2_L21	6748.93	187.969	0.2177	0.7257	0.7257
55	A	G_C0_L0	9210.53	256.528	0.2971	0.9904	0.9904
55	A	G_C2_L0	7864.71	219.045	0.2537	0.8457	0.8457
55	A	G_C0_L21	7894.64	219.878	0.2547	0.8489	0.8489
56	A	G_C0_L21	7651.83	213.116	0.2468	0.8228	0.8228
56	A	G_C1_L21	7867.73	219.129	0.2538	0.846	0.846
57	A	G_C2_L0	8755.95	243.867	0.2824	0.9415	0.9415
57	A	G_C1_L21	7299.62	203.306	0.2355	0.7849	0.7849
57	A	G_C1_L0	8549.28	238.111	0.2758	0.9193	0.9193
58	A	G_C0_L0	5675.8	158.08	0.1831	0.6103	0.6103
58	A	G_C1_L0	8722.14	242.926	0.2814	0.9379	0.9379
58	A	G_C1_L21	8385.86	233.56	0.2705	0.9017	0.9017
59	A	G_C0_L21	5883.92	163.877	0.1898	0.6327	0.6327
59	A	G_C2_L0	5634.4	156.927	0.1818	0.6058	0.6058
59	A	G_C1_L21	7209.17	200.787	0.2326	0.7752	0.7752
60	A	G_C0_L0	4782.43	133.198	0.1543	0.5142	0.5142
60	A	G_C1_L21	9288.56	258.701	0.2996	0.9988	0.9988
61	A	G_C2_L0	7630.48	212.521	0.2461	0.8205	0.8205
61	A	G_C1_L0	5778.36	160.937	0.1864	0.6213	0.6213
61	A	G_C2_L21	9177.68	255.613	0.2961	0.9868	0.9868
61	A	G_C1_L21	5440.76	151.534	0.1755	0.585	0.585
62	A	G_C1_L21	5530.26	154.027	0.1784	0.5947	0.5947
62	A	G_C2_L0	6582.9	183.344	0.2124	0.7078	0.7078
62	A	G_C0_L0	5727.63	159.524	0.1848	0.6159	0.6159
62	A	G_C0_L21	6012.98	167.471	0.194	0.6466	0.6466
63	A	G_C1_L21	5913.68	164.706	0.1908	0.6359	0.6359
63	A	G_C2_L0	7761.15	216.161	0.2504	0.8345	0.8345
63	A	G_C0_L0	3966.78	110.481	0.128	0.4265	0.4265
63	A	G_C0_L21	1692.24	47.1317	0.0546	0.182	0.182
64	A	G_C2_L0	7127.33	198.508	0.2299	0.7664	0.7664

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
64	A	G_C2_L21	7404.22	206.22	0.2388	0.7962	0.7962
64	A	G_C0_L0	7277.25	202.683	0.2347	0.7825	0.7825
64	A	G_C1_L21	3952.33	110.079	0.1275	0.425	0.425
65	A	G_C2_L21	3474.07	96.7584	0.1121	0.3736	0.3736
65	A	G_C0_L21	1108.45	30.8722	0.0358	0.1192	0.1192
66	A	G_C1_L21	7040.72	196.095	0.2271	0.7571	0.7571
66	A	G_C1_L0	6909.86	192.451	0.2229	0.743	0.743
66	A	G_C2_L0	8284.26	230.73	0.2672	0.8908	0.8908
66	A	G_C0_L21	4757.4	132.501	0.1535	0.5115	0.5115
67	A	G_C1_L0	5039.15	140.349	0.1626	0.5418	0.5418
67	A	G_C2_L21	9000.99	250.692	0.2904	0.9678	0.9678
67	A	G_C0_L0	8635.82	240.522	0.2786	0.9286	0.9286
68	A	G_C1_L21	3939.55	109.723	0.1271	0.4236	0.4236
68	A	G_C2_L21	5735.1	159.732	0.185	0.6167	0.6167
68	A	G_C0_L21	6712.62	186.957	0.2165	0.7218	0.7218
68	A	G_C0_L0	3584.03	99.821	0.1156	0.3854	0.3854
69	A	G_C0_L21	6582.54	183.334	0.2123	0.7078	0.7078
69	A	G_C1_L0	9179.67	255.669	0.2961	0.9871	0.9871
70	A	G_C0_L21	4162.22	115.924	0.1343	0.4476	0.4476
70	A	G_C0_L0	8516.91	237.21	0.2747	0.9158	0.9158
70	A	G_C2_L21	5883.66	163.869	0.1898	0.6327	0.6327
70	A	G_C1_L0	8208.89	228.631	0.2648	0.8827	0.8827
71	A	G_C1_L0	6740.93	187.746	0.2174	0.7248	0.7248
71	A	G_C2_L21	5587.12	155.61	0.1802	0.6008	0.6008
72	A	G_C1_L21	9291.83	258.792	0.2997	0.9991	0.9991
72	A	G_C2_L21	4282.25	119.267	0.1381	0.4605	0.4605
73	A	G_C1_L21	3540.03	98.5955	0.1142	0.3806	0.3806
73	A	G_C1_L0	9124.18	254.123	0.2943	0.9811	0.9811
73	A	G_C0_L21	6774.31	188.675	0.2185	0.7284	0.7284
74	A	G_C2_L0	8024.95	223.508	0.2589	0.8629	0.8629
74	A	G_C1_L21	8871.81	247.094	0.2862	0.954	0.954
75	A	G_C0_L21	7712.34	214.801	0.2488	0.8293	0.8293
75	A	G_C1_L21	7100.16	197.751	0.229	0.7635	0.7635
75	A	G_C1_L0	7661.71	213.391	0.2472	0.8238	0.8238
75	A	G_C2_L0	7437.83	207.156	0.2399	0.7998	0.7998
76	A	G_C0_L0	5603.99	156.08	0.1808	0.6026	0.6026
76	A	G_C2_L21	6353.79	176.963	0.205	0.6832	0.6832
77	A	G_C0_L21	5981.26	166.588	0.1929	0.6431	0.6431
77	A	G_C1_L0	5547.75	154.514	0.179	0.5965	0.5965
77	A	G_C2_L0	7334.24	204.27	0.2366	0.7886	0.7886
77	A	G_C0_L0	6693.49	186.424	0.2159	0.7197	0.7197
78	A	G_C2_L21	5689.72	158.468	0.1835	0.6118	0.6118
78	A	G_C1_L0	4465.41	124.369	0.144	0.4802	0.4802
79	A	G_C2_L21	7964.14	221.814	0.2569	0.8564	0.8564
79	A	G_C0_L0	2470	68.7934	0.0797	0.2656	0.2656
79	A	G_C1_L21	9032.68	251.575	0.2914	0.9713	0.9713
80	A	G_C0_L21	8197.77	228.321	0.2644	0.8815	0.8815
80	A	G_C2_L21	7190.63	200.27	0.232	0.7732	0.7732
80	A	G_C0_L0	4894.33	136.315	0.1579	0.5263	0.5263
80	A	G_C2_L0	8774.2	244.376	0.283	0.9435	0.9435
81	A	G_C0_L0	5050.48	140.664	0.1629	0.5431	0.5431
81	A	G_C2_L0	4343.33	120.969	0.1401	0.467	0.467
81	A	G_C1_L0	7584.32	211.236	0.2447	0.8155	0.8155
81	A	G_C2_L21	7882.11	219.53	0.2543	0.8475	0.8475
82	A	G_C1_L0	4242.77	118.168	0.1369	0.4562	0.4562
82	A	G_C0_L0	5549.9	154.574	0.179	0.5968	0.5968
83	A	G_C0_L0	4951.56	137.909	0.1597	0.5324	0.5324
83	A	G_C1_L0	5642.93	157.165	0.182	0.6068	0.6068
83	A	G_C2_L0	5414.77	150.81	0.1747	0.5822	0.5822
83	A	G_C2_L21	5791.57	161.305	0.1868	0.6227	0.6227
84	A	G_C1_L21	7703.32	214.55	0.2485	0.8283	0.8283
84	A	G_C0_L21	4861.78	135.408	0.1568	0.5228	0.5228
84	A	G_C1_L0	5535.56	154.174	0.1786	0.5952	0.5952
85	A	G_C2_L0	2152.08	59.9389	0.0694	0.2314	0.2314
85	A	G_C0_L21	9213.96	256.624	0.2972	0.9907	0.9907
86	A	G_C1_L0	3845.47	107.102	0.124	0.4135	0.4135
86	A	G_C2_L21	8165.93	227.434	0.2634	0.8781	0.8781
87	A	G_C1_L0	6479.75	180.471	0.209	0.6967	0.6967

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
87	A	G_C1_L21	6372.2	177.476	0.2056	0.6852	0.6852
87	A	G_C2_L0	7118.14	198.252	0.2296	0.7654	0.7654
88	A	G_C2_L0	5357.28	149.209	0.1728	0.5761	0.5761
88	A	G_C0_L21	7243.56	201.745	0.2337	0.7789	0.7789
88	A	G_C2_L21	8893.4	247.696	0.2869	0.9563	0.9563
88	A	G_C1_L0	7312.52	203.666	0.2359	0.7863	0.7863
89	A	G_C1_L21	8428.35	234.743	0.2719	0.9063	0.9063
89	A	G_C2_L21	7290.94	203.064	0.2352	0.784	0.784
89	A	G_C0_L21	5917.42	164.81	0.1909	0.6363	0.6363
89	A	G_C0_L0	8991.43	250.426	0.29	0.9668	0.9668
90	A	G_C1_L0	3668.69	102.179	0.1183	0.3945	0.3945
90	A	G_C2_L0	6559.41	182.69	0.2116	0.7053	0.7053
90	A	G_C2_L21	2174.24	60.5561	0.0701	0.2338	0.2338
91	A	G_C0_L21	7479.72	208.322	0.2413	0.8043	0.8043
91	A	G_C2_L21	5700.59	158.771	0.1839	0.613	0.613
91	A	G_C1_L21	5287.46	147.264	0.1706	0.5685	0.5685
92	A	G_C1_L21	7445.32	207.364	0.2402	0.8006	0.8006
92	A	G_C0_L21	5404.07	150.512	0.1743	0.5811	0.5811
93	A	G_C2_L21	9208.29	256.466	0.297	0.9901	0.9901
93	A	G_C0_L21	6724.35	187.284	0.2169	0.723	0.723
94	A	G_C0_L0	8517.05	237.213	0.2747	0.9158	0.9158
94	A	G_C1_L21	5213.34	145.2	0.1682	0.5606	0.5606
95	A	G_C1_L0	7128.6	198.543	0.23	0.7665	0.7665
95	A	G_C2_L0	7207.17	200.731	0.2325	0.775	0.775
95	A	G_C2_L21	3262.48	90.8653	0.1052	0.3508	0.3508
95	A	G_C0_L0	6614.12	184.214	0.2134	0.7112	0.7112
96	A	G_C2_L21	3692.44	102.841	0.1191	0.397	0.397
96	A	G_C0_L0	5454.86	151.927	0.176	0.5865	0.5865
96	A	G_C2_L0	3534.22	98.4336	0.114	0.38	0.38
97	A	G_C2_L0	6665.54	185.646	0.215	0.7167	0.7167
97	A	G_C1_L21	7752.39	215.917	0.2501	0.8336	0.8336
97	A	G_C2_L21	8376.27	233.292	0.2702	0.9007	0.9007
97	A	G_C0_L0	6796.74	189.3	0.2192	0.7308	0.7308
98	A	G_C0_L21	7499.31	208.868	0.2419	0.8064	0.8064
98	A	G_C1_L21	715.314	19.9227	0.0231	0.0769	0.0769
99	A	G_C0_L0	4966.74	138.332	0.1602	0.5341	0.5341
99	A	G_C1_L0	8002.8	222.891	0.2582	0.8605	0.8605
100	A	G_C0_L21	3995.9	111.292	0.1289	0.4297	0.4297
100	A	G_C2_L21	5270.46	146.791	0.17	0.5667	0.5667

C.3.21 stochastic_traceability_log_GSHS_B.csv

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
1	B	G_C2_L1	4893.1	136.281	0.1578	0.5261	0.5261
1	B	G_C2_L2	9163.73	255.225	0.2956	0.9853	0.9853
1	B	G_C1_L0	7517.63	209.378	0.2425	0.8083	0.8083
1	B	G_C2_L4	5119.88	142.597	0.1652	0.5505	0.5505
1	B	G_C0_L4	4934.41	137.431	0.1592	0.5306	0.5306
1	B	G_C1_L4	3489.14	97.1782	0.1126	0.3752	0.3752
1	B	G_C2_L3	1336.28	37.2175	0.0431	0.1437	0.1437
1	B	G_C0_L2	2192.85	61.0745	0.0707	0.2358	0.2358
1	B	G_C0_L1	3506.48	97.6612	0.1131	0.377	0.377
2	B	G_C1_L2	6560.54	182.722	0.2116	0.7054	0.7054
2	B	G_C1_L0	6428.02	179.031	0.2074	0.6912	0.6912
2	B	G_C2_L0	4057.34	113.004	0.1309	0.4363	0.4363
2	B	G_C0_L2	5661.43	157.68	0.1826	0.6088	0.6088
2	B	G_C0_L0	6116.71	170.36	0.1973	0.6577	0.6577
2	B	G_C2_L2	6865.32	191.21	0.2215	0.7382	0.7382
3	B	G_C0_L0	6780.77	188.856	0.2187	0.7291	0.7291
3	B	G_C1_L4	6383.3	177.785	0.2059	0.6864	0.6864
3	B	G_C2_L0	9226.75	256.98	0.2976	0.9921	0.9921
3	B	G_C2_L2	3657.62	101.871	0.118	0.3933	0.3933
3	B	G_C1_L2	4711.25	131.216	0.152	0.5066	0.5066
3	B	G_C2_L3	4828.22	134.474	0.1557	0.5192	0.5192
3	B	G_C0_L3	3637.26	101.304	0.1173	0.3911	0.3911

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	mm	N_m3	m_m	or_D
3	B	G_C1_L0	6696.58	186.511	0.216	0.7201	0.7201
3	B	G_C1_L1	8693.16	242.119	0.2804	0.9347	0.9347
4	B	G_C2_L0	7397.02	206.019	0.2386	0.7954	0.7954
4	B	G_C0_L0	3826.82	106.583	0.1234	0.4115	0.4115
4	B	G_C0_L2	4986.67	138.887	0.1609	0.5362	0.5362
4	B	G_C2_L1	6162.94	171.648	0.1988	0.6627	0.6627
4	B	G_C0_L1	8084.76	225.174	0.2608	0.8693	0.8693
4	B	G_C1_L3	4357.51	121.364	0.1406	0.4685	0.4685
4	B	G_C2_L2	7233.42	201.463	0.2333	0.7778	0.7778
5	B	G_C1_L4	9070.08	252.616	0.2926	0.9753	0.9753
5	B	G_C0_L0	3312.32	92.2533	0.1068	0.3562	0.3562
5	B	G_C0_L2	6453.62	179.744	0.2082	0.6939	0.6939
5	B	G_C0_L3	9232.7	257.146	0.2978	0.9928	0.9928
5	B	G_C2_L0	5045.41	140.523	0.1628	0.5425	0.5425
5	B	G_C2_L1	6378.14	177.642	0.2057	0.6858	0.6858
5	B	G_C1_L3	5449.02	151.764	0.1758	0.5859	0.5859
5	B	G_C2_L3	8517.69	237.231	0.2748	0.9159	0.9159
6	B	G_C2_L0	4365.13	121.576	0.1408	0.4694	0.4694
6	B	G_C2_L2	7770.63	216.424	0.2507	0.8356	0.8356
6	B	G_C1_L4	7675.25	213.768	0.2476	0.8253	0.8253
6	B	G_C0_L1	5678.35	158.151	0.1832	0.6106	0.6106
6	B	G_C1_L3	5982.42	166.62	0.193	0.6433	0.6433
6	B	G_C0_L3	6344.92	176.716	0.2047	0.6822	0.6822
6	B	G_C2_L3	8521.88	237.348	0.2749	0.9163	0.9163
6	B	G_C2_L1	8628.56	240.319	0.2783	0.9278	0.9278
6	B	G_C2_L4	5574.62	155.262	0.1798	0.5994	0.5994
7	B	G_C0_L2	3609.56	100.532	0.1164	0.3881	0.3881
7	B	G_C2_L2	6150.81	171.31	0.1984	0.6614	0.6614
7	B	G_C2_L3	2286.16	63.6732	0.0737	0.2458	0.2458
7	B	G_C1_L3	6270.51	174.644	0.2023	0.6742	0.6742
7	B	G_C1_L1	8613.92	239.911	0.2779	0.9262	0.9262
7	B	G_C0_L3	4435.57	123.538	0.1431	0.4769	0.4769
7	B	G_C2_L4	4826.08	134.414	0.1557	0.5189	0.5189
8	B	G_C2_L4	6516.14	181.485	0.2102	0.7007	0.7007
8	B	G_C0_L4	6019.98	167.666	0.1942	0.6473	0.6473
8	B	G_C0_L0	5490.55	152.921	0.1771	0.5904	0.5904
8	B	G_C0_L2	2474.13	68.9086	0.0798	0.266	0.266
8	B	G_C2_L1	4836.02	134.691	0.156	0.52	0.52
8	B	G_C1_L2	3469.85	96.6409	0.1119	0.3731	0.3731
8	B	G_C1_L4	6597.21	183.743	0.2128	0.7094	0.7094
9	B	G_C2_L0	5479.73	152.619	0.1768	0.5892	0.5892
9	B	G_C1_L3	5645.69	157.242	0.1821	0.6071	0.6071
9	B	G_C2_L4	4377.92	121.932	0.1412	0.4707	0.4707
9	B	G_C1_L1	8294.8	231.023	0.2676	0.8919	0.8919
9	B	G_C0_L0	9108.5	253.686	0.2938	0.9794	0.9794
9	B	G_C2_L1	6455.15	179.786	0.2082	0.6941	0.6941
9	B	G_C1_L4	684.227	19.0568	0.0221	0.0736	0.0736
9	B	G_C0_L1	7661.61	213.388	0.2471	0.8238	0.8238
9	B	G_C0_L3	4434.03	123.495	0.143	0.4768	0.4768
10	B	G_C1_L2	8236.71	229.406	0.2657	0.8857	0.8857
10	B	G_C0_L2	5816.04	161.986	0.1876	0.6254	0.6254
10	B	G_C0_L0	5200.47	144.841	0.1678	0.5592	0.5592
10	B	G_C1_L1	3978.38	110.804	0.1283	0.4278	0.4278
10	B	G_C1_L3	6991.96	194.737	0.2255	0.7518	0.7518
11	B	G_C0_L4	8359.5	232.825	0.2697	0.8989	0.8989
11	B	G_C1_L2	6552.61	182.501	0.2114	0.7046	0.7046
11	B	G_C2_L4	5395.74	150.28	0.1741	0.5802	0.5802
11	B	G_C1_L0	5756.29	160.322	0.1857	0.619	0.619
11	B	G_C2_L1	7686.7	214.087	0.248	0.8265	0.8265
11	B	G_C0_L3	8123.65	226.257	0.2621	0.8735	0.8735
11	B	G_C1_L3	7301.66	203.363	0.2355	0.7851	0.7851
12	B	G_C1_L0	8370.82	233.141	0.27	0.9001	0.9001
12	B	G_C0_L1	8302.43	231.236	0.2678	0.8927	0.8927
12	B	G_C2_L4	7947.14	221.341	0.2564	0.8545	0.8545
12	B	G_C0_L2	6316.91	175.936	0.2038	0.6792	0.6792
12	B	G_C0_L0	3938.28	109.688	0.127	0.4235	0.4235
13	B	G_C1_L1	9126.06	254.175	0.2944	0.9813	0.9813
13	B	G_C0_L4	1343.45	37.4172	0.0433	0.1445	0.1445

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	_mm	N_m3	_m_m	or_D
13	B	G_C2_L0	5552.84	154.656	0.1791	0.5971	0.5971
13	B	G_C0_L3	3649.3	101.639	0.1177	0.3924	0.3924
13	B	G_C1_L0	4945.21	137.732	0.1595	0.5317	0.5317
13	B	G_C1_L2	8851.77	246.536	0.2855	0.9518	0.9518
13	B	G_C1_L3	2882.54	80.2834	0.093	0.31	0.31
14	B	G_C2_L2	3360.92	93.6071	0.1084	0.3614	0.3614
14	B	G_C0_L4	6706.15	186.777	0.2163	0.7211	0.7211
14	B	G_C0_L0	6828.76	190.192	0.2203	0.7343	0.7343
14	B	G_C2_L4	8122.51	226.225	0.262	0.8734	0.8734
14	B	G_C0_L3	6597.63	183.755	0.2128	0.7094	0.7094
15	B	G_C1_L4	6657.78	185.43	0.2148	0.7159	0.7159
15	B	G_C2_L0	7735.91	215.458	0.2495	0.8318	0.8318
15	B	G_C2_L4	1871.64	52.1283	0.0604	0.2013	0.2013
15	B	G_C2_L3	5642.83	157.162	0.182	0.6068	0.6068
15	B	G_C2_L2	7418.17	206.608	0.2393	0.7977	0.7977
15	B	G_C0_L1	8121.3	226.191	0.262	0.8733	0.8733
16	B	G_C2_L2	5490.99	152.933	0.1771	0.5904	0.5904
16	B	G_C2_L3	8483.85	236.289	0.2737	0.9122	0.9122
16	B	G_C2_L0	5036.1	140.263	0.1625	0.5415	0.5415
16	B	G_C0_L3	8820.99	245.679	0.2845	0.9485	0.9485
16	B	G_C1_L4	6012.38	167.454	0.1939	0.6465	0.6465
16	B	G_C1_L3	5586.85	155.603	0.1802	0.6007	0.6007
17	B	G_C1_L4	5899.5	164.31	0.1903	0.6344	0.6344
17	B	G_C2_L3	8662.77	241.272	0.2794	0.9315	0.9315
17	B	G_C0_L0	8126.62	226.34	0.2621	0.8738	0.8738
17	B	G_C2_L2	7846.01	218.524	0.2531	0.8437	0.8437
17	B	G_C0_L3	6275.39	174.78	0.2024	0.6748	0.6748
17	B	G_C2_L0	1345.35	37.4701	0.0434	0.1447	0.1447
17	B	G_C2_L4	6841.53	190.548	0.2207	0.7356	0.7356
17	B	G_C0_L2	3865.38	107.657	0.1247	0.4156	0.4156
17	B	G_C0_L1	6234.31	173.636	0.2011	0.6704	0.6704
18	B	G_C0_L4	6715.4	187.035	0.2166	0.7221	0.7221
18	B	G_C0_L2	4056.79	112.988	0.1309	0.4362	0.4362
18	B	G_C2_L3	4783.34	133.224	0.1543	0.5143	0.5143
18	B	G_C0_L1	5067.03	141.125	0.1635	0.5448	0.5448
18	B	G_C0_L0	7874.61	219.321	0.254	0.8467	0.8467
18	B	G_C1_L3	8945.76	249.154	0.2886	0.9619	0.9619
18	B	G_C1_L4	6122.67	170.526	0.1975	0.6584	0.6584
18	B	G_C2_L4	8126.4	226.333	0.2621	0.8738	0.8738
18	B	G_C2_L1	6997.34	194.887	0.2257	0.7524	0.7524
19	B	G_C1_L3	5364.1	149.399	0.173	0.5768	0.5768
19	B	G_C0_L0	7607.59	211.884	0.2454	0.818	0.818
19	B	G_C2_L0	8172.31	227.612	0.2636	0.8787	0.8787
19	B	G_C2_L2	6881.87	191.671	0.222	0.74	0.74
19	B	G_C2_L3	6683.4	186.143	0.2156	0.7186	0.7186
19	B	G_C2_L1	6822.49	190.017	0.2201	0.7336	0.7336
19	B	G_C0_L3	4156.68	115.77	0.1341	0.447	0.447
19	B	G_C0_L4	9298.72	258.984	0.3	0.9999	0.9999
19	B	G_C1_L4	4272.94	119.008	0.1378	0.4595	0.4595
20	B	G_C0_L1	4697.97	130.846	0.1515	0.5052	0.5052
20	B	G_C1_L2	6529.22	181.849	0.2106	0.7021	0.7021
20	B	G_C2_L3	7395.34	205.972	0.2386	0.7952	0.7952
20	B	G_C0_L3	4916.3	136.927	0.1586	0.5286	0.5286
20	B	G_C2_L4	8168.26	227.499	0.2635	0.8783	0.8783
20	B	G_C1_L4	8933.89	248.823	0.2882	0.9606	0.9606
20	B	G_C2_L0	6617.24	184.301	0.2135	0.7115	0.7115
21	B	G_C0_L2	4729.73	131.731	0.1526	0.5086	0.5086
21	B	G_C1_L1	8252.05	229.833	0.2662	0.8873	0.8873
21	B	G_C2_L3	5565.45	155.007	0.1795	0.5984	0.5984
21	B	G_C1_L4	8482.98	236.265	0.2736	0.9121	0.9121
21	B	G_C0_L0	4293.06	119.569	0.1385	0.4616	0.4616
21	B	G_C2_L1	8778.26	244.489	0.2832	0.9439	0.9439
21	B	G_C1_L2	5664.9	157.777	0.1827	0.6091	0.6091
21	B	G_C2_L2	7475	208.191	0.2411	0.8038	0.8038
22	B	G_C2_L3	1836.73	51.1559	0.0592	0.1975	0.1975
22	B	G_C2_L4	3730.33	103.896	0.1203	0.4011	0.4011
22	B	G_C2_L1	7487.68	208.544	0.2415	0.8051	0.8051
22	B	G_C0_L3	1613.11	44.9278	0.052	0.1735	0.1735

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
22	B	G_C1_L0	6699.01	186.578	0.2161	0.7203	0.7203
23	B	G_C1_L2	7250.15	201.929	0.2339	0.7796	0.7796
23	B	G_C1_L1	7775.82	216.569	0.2508	0.8361	0.8361
23	B	G_C1_L4	7536.42	209.901	0.2431	0.8104	0.8104
23	B	G_C1_L0	7045.85	196.238	0.2273	0.7576	0.7576
23	B	G_C2_L1	3196.85	89.0375	0.1031	0.3437	0.3437
23	B	G_C0_L3	5043.97	140.483	0.1627	0.5424	0.5424
24	B	G_C2_L3	6602.65	183.894	0.213	0.71	0.71
24	B	G_C0_L3	3358.82	93.5486	0.1083	0.3612	0.3612
24	B	G_C1_L4	7906.13	220.198	0.255	0.8501	0.8501
24	B	G_C0_L4	3041.39	84.7077	0.0981	0.327	0.327
24	B	G_C1_L1	8079.95	225.04	0.2606	0.8688	0.8688
24	B	G_C1_L0	4921.67	137.076	0.1588	0.5292	0.5292
24	B	G_C2_L4	6467.48	180.13	0.2086	0.6954	0.6954
25	B	G_C1_L0	6765.5	188.43	0.2182	0.7275	0.7275
25	B	G_C2_L1	3529.18	98.2935	0.1138	0.3795	0.3795
25	B	G_C1_L2	4970.77	138.444	0.1603	0.5345	0.5345
25	B	G_C2_L2	5629.74	156.797	0.1816	0.6053	0.6053
25	B	G_C0_L3	9150.23	254.849	0.2952	0.9839	0.9839
25	B	G_C2_L3	7729.7	215.285	0.2493	0.8312	0.8312
25	B	G_C0_L2	8340.09	232.285	0.269	0.8968	0.8968
25	B	G_C0_L0	6923.82	192.84	0.2233	0.7445	0.7445
25	B	G_C0_L4	3633.22	101.191	0.1172	0.3907	0.3907
26	B	G_C2_L0	3605.81	100.428	0.1163	0.3877	0.3877
26	B	G_C0_L4	1991.35	55.4622	0.0642	0.2141	0.2141
26	B	G_C2_L4	6291.7	175.234	0.203	0.6765	0.6765
26	B	G_C2_L1	7768.64	216.369	0.2506	0.8353	0.8353
26	B	G_C0_L1	5564.04	154.968	0.1795	0.5983	0.5983
26	B	G_C0_L0	3560.05	99.1531	0.1148	0.3828	0.3828
26	B	G_C2_L2	8536.7	237.761	0.2754	0.9179	0.9179
27	B	G_C0_L0	8928.84	248.683	0.288	0.9601	0.9601
27	B	G_C0_L3	7031.62	195.842	0.2268	0.7561	0.7561
27	B	G_C2_L4	6080.82	169.361	0.1962	0.6539	0.6539
27	B	G_C2_L2	7706.48	214.638	0.2486	0.8287	0.8287
27	B	G_C2_L1	6793.66	189.214	0.2192	0.7305	0.7305
27	B	G_C0_L1	6137.93	170.951	0.198	0.66	0.66
27	B	G_C1_L3	8328.54	231.963	0.2687	0.8955	0.8955
27	B	G_C0_L2	7058.62	196.594	0.2277	0.759	0.759
27	B	G_C2_L3	3273.82	91.1812	0.1056	0.352	0.352
28	B	G_C0_L3	5733.66	159.692	0.185	0.6165	0.6165
28	B	G_C2_L1	6817.6	189.881	0.2199	0.7331	0.7331
28	B	G_C2_L2	8383.81	233.503	0.2704	0.9015	0.9015
28	B	G_C2_L0	7007.13	195.16	0.226	0.7535	0.7535
28	B	G_C1_L1	4343.4	120.971	0.1401	0.467	0.467
28	B	G_C1_L0	8137.46	226.641	0.2625	0.875	0.875
28	B	G_C2_L4	5394.63	150.249	0.174	0.5801	0.5801
28	B	G_C1_L4	8834.16	246.046	0.285	0.9499	0.9499
29	B	G_C0_L3	6452.12	179.702	0.2081	0.6938	0.6938
29	B	G_C0_L2	6808.59	189.63	0.2196	0.7321	0.7321
29	B	G_C0_L0	6167.34	171.77	0.1989	0.6632	0.6632
29	B	G_C2_L0	2538.44	70.6996	0.0819	0.273	0.273
29	B	G_C1_L1	5600.16	155.974	0.1807	0.6022	0.6022
30	B	G_C1_L3	5239.28	145.922	0.169	0.5634	0.5634
30	B	G_C1_L4	1990.58	55.4409	0.0642	0.214	0.214
30	B	G_C2_L2	7823.32	217.892	0.2524	0.8412	0.8412
30	B	G_C2_L1	3738.98	104.137	0.1206	0.402	0.402
30	B	G_C0_L3	8283.81	230.718	0.2672	0.8907	0.8907
30	B	G_C0_L4	7167.06	199.614	0.2312	0.7707	0.7707
30	B	G_C2_L4	9039.34	251.76	0.2916	0.972	0.972
30	B	G_C1_L0	7805.28	217.39	0.2518	0.8393	0.8393
31	B	G_C0_L3	7354.01	204.821	0.2372	0.7908	0.7908
31	B	G_C2_L2	7881.52	219.513	0.2542	0.8475	0.8475
31	B	G_C2_L4	6649.13	185.189	0.2145	0.715	0.715
31	B	G_C1_L4	7504.27	209.006	0.2421	0.8069	0.8069
31	B	G_C1_L2	8390.7	233.695	0.2707	0.9022	0.9022
31	B	G_C0_L2	1988.86	55.393	0.0642	0.2139	0.2139
31	B	G_C2_L1	8639.48	240.623	0.2787	0.929	0.929
31	B	G_C0_L4	6500.47	181.048	0.2097	0.699	0.699

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
32	B	G_C2_L4	6488.58	180.718	0.2093	0.6977	0.6977
32	B	G_C2_L0	8510.58	237.033	0.2745	0.9151	0.9151
32	B	G_C0_L1	5968.96	166.245	0.1925	0.6418	0.6418
32	B	G_C2_L3	7019.29	195.499	0.2264	0.7548	0.7548
32	B	G_C2_L1	7966.26	221.873	0.257	0.8566	0.8566
32	B	G_C1_L3	7686.82	214.09	0.248	0.8265	0.8265
32	B	G_C0_L3	7371.4	205.305	0.2378	0.7926	0.7926
32	B	G_C1_L1	8839.15	246.185	0.2851	0.9504	0.9504
32	B	G_C2_L2	9294.37	258.863	0.2998	0.9994	0.9994
33	B	G_C0_L1	5076.57	141.391	0.1638	0.5459	0.5459
33	B	G_C0_L2	8752.44	243.769	0.2823	0.9411	0.9411
33	B	G_C1_L0	5373.46	149.659	0.1733	0.5778	0.5778
33	B	G_C1_L1	6380.51	177.708	0.2058	0.6861	0.6861
33	B	G_C1_L2	9012.43	251.011	0.2907	0.9691	0.9691
33	B	G_C1_L4	7223.31	201.181	0.233	0.7767	0.7767
33	B	G_C2_L0	8567.01	238.605	0.2764	0.9212	0.9212
33	B	G_C0_L4	9283.74	258.567	0.2995	0.9983	0.9983
33	B	G_C0_L0	8799.54	245.081	0.2839	0.9462	0.9462
34	B	G_C1_L3	5321.35	148.208	0.1717	0.5722	0.5722
34	B	G_C0_L4	7460.27	207.78	0.2407	0.8022	0.8022
34	B	G_C2_L4	7380.9	205.57	0.2381	0.7936	0.7936
34	B	G_C2_L2	6909.06	192.429	0.2229	0.7429	0.7429
34	B	G_C0_L0	6039.56	168.212	0.1948	0.6494	0.6494
34	B	G_C0_L3	7666.57	213.526	0.2473	0.8244	0.8244
35	B	G_C1_L0	7823.5	217.897	0.2524	0.8412	0.8412
35	B	G_C2_L1	8592.08	239.303	0.2772	0.9239	0.9239
35	B	G_C0_L4	4854.64	135.21	0.1566	0.522	0.522
35	B	G_C1_L1	8513.97	237.128	0.2746	0.9155	0.9155
35	B	G_C2_L2	7053.02	196.438	0.2275	0.7584	0.7584
35	B	G_C2_L3	8042.8	224.005	0.2594	0.8648	0.8648
35	B	G_C2_L0	8294.77	231.023	0.2676	0.8919	0.8919
36	B	G_C1_L0	6235.23	173.661	0.2011	0.6705	0.6705
36	B	G_C0_L2	6844.89	190.641	0.2208	0.736	0.736
36	B	G_C1_L3	7277.99	202.704	0.2348	0.7826	0.7826
36	B	G_C2_L4	8803.74	245.198	0.284	0.9466	0.9466
36	B	G_C0_L3	9183.45	255.774	0.2962	0.9875	0.9875
36	B	G_C2_L3	7596.24	211.568	0.245	0.8168	0.8168
36	B	G_C1_L1	6476.7	180.387	0.2089	0.6964	0.6964
36	B	G_C0_L4	856.225	23.8472	0.0276	0.0921	0.0921
37	B	G_C0_L0	5784.77	161.115	0.1866	0.622	0.622
37	B	G_C0_L2	8053.31	224.298	0.2598	0.8659	0.8659
37	B	G_C1_L2	6591.1	183.573	0.2126	0.7087	0.7087
37	B	G_C0_L4	4122.62	114.822	0.133	0.4433	0.4433
37	B	G_C1_L0	4631.84	129.004	0.1494	0.498	0.498
37	B	G_C1_L4	4793.11	133.496	0.1546	0.5154	0.5154
37	B	G_C1_L1	4012.13	111.744	0.1294	0.4314	0.4314
37	B	G_C0_L1	8763.5	244.078	0.2827	0.9423	0.9423
37	B	G_C1_L3	5022.81	139.893	0.162	0.5401	0.5401
38	B	G_C2_L1	8717.99	242.81	0.2812	0.9374	0.9374
38	B	G_C2_L3	3890.01	108.343	0.1255	0.4183	0.4183
38	B	G_C0_L3	8227.84	229.159	0.2654	0.8847	0.8847
38	B	G_C1_L0	6363.49	177.233	0.2053	0.6842	0.6842
38	B	G_C0_L4	7948.76	221.386	0.2564	0.8547	0.8547
38	B	G_C2_L2	7593.85	211.501	0.245	0.8165	0.8165
39	B	G_C2_L2	7787.02	216.881	0.2512	0.8373	0.8373
39	B	G_C1_L4	9137.27	254.488	0.2948	0.9825	0.9825
39	B	G_C2_L3	3303.99	92.0216	0.1066	0.3553	0.3553
39	B	G_C1_L1	7027.07	195.715	0.2267	0.7556	0.7556
39	B	G_C0_L1	6164.86	171.701	0.1989	0.6629	0.6629
39	B	G_C0_L4	8700.66	242.327	0.2807	0.9356	0.9356
39	B	G_C1_L2	4647.61	129.443	0.1499	0.4997	0.4997
39	B	G_C0_L2	6964.17	193.963	0.2247	0.7488	0.7488
39	B	G_C0_L3	8190.71	228.125	0.2642	0.8807	0.8807
40	B	G_C0_L4	4407.05	122.743	0.1422	0.4739	0.4739
40	B	G_C0_L0	8182.51	227.896	0.264	0.8798	0.8798
40	B	G_C0_L2	5407.38	150.604	0.1744	0.5814	0.5814
40	B	G_C2_L2	6631.83	184.707	0.2139	0.7131	0.7131
40	B	G_C1_L3	4932.81	137.387	0.1591	0.5304	0.5304

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
40	B	G_C1_L4	5342.17	148.788	0.1723	0.5744	0.5744
40	B	G_C2_L1	7235.36	201.517	0.2334	0.778	0.778
40	B	G_C1_L2	5146.78	143.346	0.166	0.5534	0.5534
41	B	G_C1_L0	5572.58	155.206	0.1798	0.5992	0.5992
41	B	G_C2_L2	7439.05	207.19	0.24	0.7999	0.7999
41	B	G_C0_L3	9004.3	250.784	0.2905	0.9682	0.9682
41	B	G_C0_L0	8752.14	243.761	0.2823	0.9411	0.9411
41	B	G_C0_L4	4867.67	135.573	0.157	0.5234	0.5234
41	B	G_C0_L2	8129.59	226.422	0.2622	0.8741	0.8741
41	B	G_C1_L4	4277.32	119.13	0.138	0.4599	0.4599
41	B	G_C0_L1	7183.9	200.083	0.2317	0.7725	0.7725
42	B	G_C2_L3	8724.94	243.004	0.2814	0.9382	0.9382
42	B	G_C1_L1	7867.42	219.12	0.2538	0.846	0.846
42	B	G_C2_L2	8924.82	248.571	0.2879	0.9597	0.9597
42	B	G_C0_L4	7583.91	211.224	0.2446	0.8155	0.8155
42	B	G_C0_L1	6533.17	181.959	0.2107	0.7025	0.7025
42	B	G_C2_L1	7207.48	200.74	0.2325	0.775	0.775
42	B	G_C0_L2	8906.2	248.052	0.2873	0.9577	0.9577
42	B	G_C1_L3	6495.38	180.907	0.2095	0.6984	0.6984
43	B	G_C1_L2	6771.91	188.609	0.2184	0.7282	0.7282
43	B	G_C2_L0	6116.94	170.367	0.1973	0.6577	0.6577
43	B	G_C0_L2	4449.15	123.916	0.1435	0.4784	0.4784
43	B	G_C2_L3	6629.48	184.642	0.2139	0.7128	0.7128
43	B	G_C2_L1	8608.82	239.769	0.2777	0.9257	0.9257
43	B	G_C2_L4	6123.71	170.555	0.1975	0.6585	0.6585
43	B	G_C1_L4	9025.27	251.368	0.2911	0.9705	0.9705
43	B	G_C1_L1	5413	150.761	0.1746	0.582	0.582
43	B	G_C0_L0	8830.18	245.935	0.2848	0.9495	0.9495
44	B	G_C0_L0	6412.05	178.586	0.2068	0.6895	0.6895
44	B	G_C2_L2	7251.29	201.96	0.2339	0.7797	0.7797
44	B	G_C1_L3	5538.78	154.264	0.1787	0.5956	0.5956
44	B	G_C2_L0	8082.17	225.101	0.2607	0.8691	0.8691
44	B	G_C0_L4	8261.26	230.089	0.2665	0.8883	0.8883
44	B	G_C2_L4	7071.1	196.941	0.2281	0.7603	0.7603
45	B	G_C1_L2	4614.69	128.527	0.1489	0.4962	0.4962
45	B	G_C0_L2	8865.09	246.907	0.286	0.9532	0.9532
45	B	G_C2_L0	7786.35	216.863	0.2512	0.8372	0.8372
45	B	G_C0_L0	2809.07	78.2371	0.0906	0.3021	0.3021
45	B	G_C0_L3	8504.74	236.871	0.2743	0.9145	0.9145
45	B	G_C2_L3	5723.99	159.422	0.1846	0.6155	0.6155
45	B	G_C1_L4	7051.87	196.406	0.2275	0.7583	0.7583
45	B	G_C2_L2	5682.57	158.269	0.1833	0.611	0.611
46	B	G_C1_L3	8705.14	242.452	0.2808	0.936	0.936
46	B	G_C2_L4	8585.63	239.124	0.277	0.9232	0.9232
46	B	G_C0_L0	8988.86	250.354	0.29	0.9665	0.9665
46	B	G_C2_L3	7358.94	204.958	0.2374	0.7913	0.7913
46	B	G_C2_L1	7308.53	203.554	0.2358	0.7859	0.7859
46	B	G_C0_L4	8211.81	228.712	0.2649	0.883	0.883
46	B	G_C1_L4	4666.31	129.964	0.1505	0.5018	0.5018
46	B	G_C1_L2	7228.12	201.315	0.2332	0.7772	0.7772
47	B	G_C2_L0	8789.59	244.804	0.2835	0.9451	0.9451
47	B	G_C0_L0	6707.51	186.815	0.2164	0.7212	0.7212
47	B	G_C1_L4	4880.74	135.937	0.1574	0.5248	0.5248
47	B	G_C1_L1	5647.64	157.296	0.1822	0.6073	0.6073
47	B	G_C2_L4	5118.61	142.561	0.1651	0.5504	0.5504
47	B	G_C1_L2	6182.32	172.188	0.1994	0.6648	0.6648
47	B	G_C0_L1	4636.94	129.146	0.1496	0.4986	0.4986
48	B	G_C0_L1	6059.21	168.759	0.1955	0.6515	0.6515
48	B	G_C1_L1	8262.39	230.121	0.2665	0.8884	0.8884
48	B	G_C2_L2	4061.05	113.107	0.131	0.4367	0.4367
48	B	G_C0_L3	8141.3	226.748	0.2626	0.8754	0.8754
48	B	G_C1_L4	6919.79	192.727	0.2232	0.7441	0.7441
48	B	G_C0_L0	5603.69	156.072	0.1808	0.6025	0.6025
48	B	G_C1_L2	5827.73	162.312	0.188	0.6266	0.6266
48	B	G_C0_L4	6075.49	169.212	0.196	0.6533	0.6533
49	B	G_C0_L2	4705.96	131.069	0.1518	0.506	0.506
49	B	G_C0_L3	8429.86	234.785	0.2719	0.9064	0.9064
49	B	G_C1_L1	8866.16	246.937	0.286	0.9534	0.9534

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N mm	Applied_ks_M N_m3	Applied_kbond_N m_m	Damage_Fact or_D
49	B	G_C0_L1	8808.89	245.342	0.2842	0.9472	0.9472
49	B	G_C1_L0	7725.8	215.176	0.2492	0.8307	0.8307
50	B	G_C1_L0	7673.9	213.73	0.2475	0.8252	0.8252
50	B	G_C0_L2	8886.68	247.508	0.2867	0.9556	0.9556
50	B	G_C2_L3	9019.98	251.221	0.291	0.9699	0.9699
50	B	G_C0_L3	8592.73	239.321	0.2772	0.9239	0.9239
50	B	G_C0_L0	8170.58	227.564	0.2636	0.8786	0.8786
51	B	G_C2_L4	7765.89	216.293	0.2505	0.835	0.835
51	B	G_C2_L2	3232.6	90.0331	0.1043	0.3476	0.3476
51	B	G_C1_L2	9085.99	253.06	0.2931	0.977	0.977
51	B	G_C1_L1	5470.67	152.367	0.1765	0.5882	0.5882
51	B	G_C2_L3	7301.91	203.37	0.2355	0.7852	0.7852
51	B	G_C2_L0	8532.11	237.633	0.2752	0.9174	0.9174
51	B	G_C1_L3	2498.75	69.5942	0.0806	0.2687	0.2687
51	B	G_C1_L0	4068.98	113.328	0.1313	0.4375	0.4375
52	B	G_C2_L4	8344.49	232.408	0.2692	0.8973	0.8973
52	B	G_C1_L1	6770	188.555	0.2184	0.728	0.728
52	B	G_C2_L1	5199.9	144.826	0.1677	0.5591	0.5591
52	B	G_C1_L4	4521.48	125.93	0.1459	0.4862	0.4862
52	B	G_C2_L0	7274.1	202.595	0.2346	0.7822	0.7822
52	B	G_C0_L1	5294.03	147.447	0.1708	0.5693	0.5693
53	B	G_C2_L2	7205.85	200.695	0.2324	0.7748	0.7748
53	B	G_C1_L4	4246.6	118.275	0.137	0.4566	0.4566
53	B	G_C0_L3	3224.1	89.7963	0.104	0.3467	0.3467
53	B	G_C2_L0	7789.21	216.942	0.2513	0.8375	0.8375
53	B	G_C2_L3	5069.84	141.203	0.1635	0.5451	0.5451
53	B	G_C0_L2	4602.49	128.187	0.1485	0.4949	0.4949
53	B	G_C0_L4	7080.68	197.208	0.2284	0.7614	0.7614
54	B	G_C1_L2	6723.28	187.254	0.2169	0.7229	0.7229
54	B	G_C0_L4	8132.84	226.513	0.2623	0.8745	0.8745
54	B	G_C0_L3	7217.82	201.028	0.2328	0.7761	0.7761
54	B	G_C2_L3	4855.28	135.227	0.1566	0.5221	0.5221
54	B	G_C1_L1	7258.83	202.17	0.2342	0.7805	0.7805
55	B	G_C0_L3	7998.33	222.766	0.258	0.86	0.86
55	B	G_C0_L4	7056.5	196.535	0.2276	0.7588	0.7588
55	B	G_C2_L3	8067.37	224.689	0.2602	0.8675	0.8675
55	B	G_C0_L1	9099.93	253.448	0.2935	0.9785	0.9785
55	B	G_C2_L4	7541.44	210.041	0.2433	0.8109	0.8109
56	B	G_C1_L3	3299.12	91.8859	0.1064	0.3547	0.3547
56	B	G_C0_L4	6275.43	174.781	0.2024	0.6748	0.6748
56	B	G_C2_L4	4060.94	113.104	0.131	0.4367	0.4367
56	B	G_C2_L3	6065.93	168.946	0.1957	0.6523	0.6523
56	B	G_C2_L0	9002.75	250.741	0.2904	0.968	0.968
56	B	G_C1_L1	7037.29	196	0.227	0.7567	0.7567
56	B	G_C2_L1	4134.18	115.144	0.1334	0.4445	0.4445
56	B	G_C1_L0	8018.16	223.319	0.2587	0.8622	0.8622
56	B	G_C0_L3	6377.65	177.628	0.2057	0.6858	0.6858
57	B	G_C0_L4	6265.37	174.501	0.2021	0.6737	0.6737
57	B	G_C0_L1	1185.75	33.0251	0.0383	0.1275	0.1275
57	B	G_C0_L3	7854.4	218.758	0.2534	0.8446	0.8446
57	B	G_C1_L2	8366.85	233.03	0.2699	0.8997	0.8997
57	B	G_C1_L1	3709.68	103.32	0.1197	0.3989	0.3989
57	B	G_C1_L0	8289.77	230.883	0.2674	0.8914	0.8914
57	B	G_C0_L0	7963.69	221.802	0.2569	0.8563	0.8563
57	B	G_C1_L4	6145.69	171.167	0.1982	0.6608	0.6608
57	B	G_C2_L2	4053.57	112.898	0.1308	0.4359	0.4359
58	B	G_C2_L0	5381.77	149.891	0.1736	0.5787	0.5787
58	B	G_C0_L4	8021.27	223.405	0.2588	0.8625	0.8625
58	B	G_C0_L0	2479.01	69.0445	0.08	0.2666	0.2666
58	B	G_C1_L3	7315.12	203.738	0.236	0.7866	0.7866
58	B	G_C2_L4	946.602	26.3644	0.0305	0.1018	0.1018
58	B	G_C0_L2	8103.15	225.686	0.2614	0.8713	0.8713
58	B	G_C0_L3	7516.19	209.338	0.2425	0.8082	0.8082
58	B	G_C1_L0	6020.16	167.671	0.1942	0.6473	0.6473
59	B	G_C1_L1	7869.16	219.169	0.2538	0.8461	0.8461
59	B	G_C1_L2	8501.49	236.78	0.2742	0.9141	0.9141
59	B	G_C0_L0	6825.14	190.091	0.2202	0.7339	0.7339
59	B	G_C0_L4	5947.67	165.652	0.1919	0.6395	0.6395

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
59	B	G_C2_L3	7193.36	200.347	0.232	0.7735	0.7735
59	B	G_C1_L4	8794.57	244.943	0.2837	0.9457	0.9457
59	B	G_C0_L3	5915.32	164.751	0.1908	0.6361	0.6361
60	B	G_C1_L0	6658.03	185.437	0.2148	0.7159	0.7159
60	B	G_C0_L4	7382.68	205.62	0.2382	0.7938	0.7938
60	B	G_C2_L3	8673.99	241.585	0.2798	0.9327	0.9327
60	B	G_C2_L0	8439.19	235.045	0.2722	0.9074	0.9074
60	B	G_C0_L0	9081.96	252.947	0.293	0.9766	0.9766
60	B	G_C0_L2	6631.91	184.709	0.2139	0.7131	0.7131
61	B	G_C2_L2	8200.26	228.391	0.2645	0.8817	0.8817
61	B	G_C1_L3	8474.62	236.032	0.2734	0.9112	0.9112
61	B	G_C0_L4	6409.05	178.502	0.2067	0.6891	0.6891
61	B	G_C2_L4	6742.6	187.792	0.2175	0.725	0.725
61	B	G_C0_L1	6621.6	184.422	0.2136	0.712	0.712
61	B	G_C2_L3	8647.61	240.85	0.279	0.9299	0.9299
61	B	G_C1_L1	7131.92	198.635	0.2301	0.7669	0.7669
61	B	G_C2_L1	7338.35	204.385	0.2367	0.7891	0.7891
62	B	G_C2_L4	8275.42	230.484	0.2669	0.8898	0.8898
62	B	G_C0_L4	3311.71	92.2366	0.1068	0.3561	0.3561
62	B	G_C1_L0	9291.69	258.788	0.2997	0.9991	0.9991
62	B	G_C2_L3	3867.39	107.713	0.1248	0.4158	0.4158
62	B	G_C1_L3	5405.47	150.551	0.1744	0.5812	0.5812
62	B	G_C1_L2	7829.43	218.062	0.2526	0.8419	0.8419
62	B	G_C0_L2	8199.42	228.367	0.2645	0.8817	0.8817
62	B	G_C2_L1	9106.24	253.623	0.2937	0.9792	0.9792
63	B	G_C0_L1	5287.85	147.275	0.1706	0.5686	0.5686
63	B	G_C1_L4	7883.3	219.563	0.2543	0.8477	0.8477
63	B	G_C0_L2	6045.19	168.368	0.195	0.65	0.65
63	B	G_C1_L2	5284.94	147.194	0.1705	0.5683	0.5683
63	B	G_C2_L0	4474.07	124.61	0.1443	0.4811	0.4811
63	B	G_C1_L3	2619.6	72.96	0.0845	0.2817	0.2817
63	B	G_C2_L2	3172.69	88.3645	0.1023	0.3411	0.3411
63	B	G_C2_L4	5203.38	144.923	0.1679	0.5595	0.5595
64	B	G_C0_L3	5123.09	142.686	0.1653	0.5509	0.5509
64	B	G_C0_L4	8041.94	223.981	0.2594	0.8647	0.8647
64	B	G_C0_L1	7531.76	209.772	0.243	0.8099	0.8099
64	B	G_C2_L0	7054.38	196.476	0.2276	0.7585	0.7585
64	B	G_C1_L1	7871.29	219.228	0.2539	0.8464	0.8464
65	B	G_C0_L1	2699.51	75.1857	0.0871	0.2903	0.2903
65	B	G_C0_L2	5634.35	156.926	0.1818	0.6058	0.6058
65	B	G_C1_L1	7568.04	210.782	0.2441	0.8138	0.8138
65	B	G_C1_L3	1937.68	53.9675	0.0625	0.2084	0.2084
65	B	G_C2_L4	7727.11	215.213	0.2493	0.8309	0.8309
66	B	G_C1_L4	8505.26	236.885	0.2744	0.9145	0.9145
66	B	G_C0_L0	9260.38	257.917	0.2987	0.9957	0.9957
66	B	G_C0_L4	8817.9	245.593	0.2844	0.9482	0.9482
66	B	G_C1_L0	7944.72	221.273	0.2563	0.8543	0.8543
66	B	G_C2_L2	6693.82	186.434	0.2159	0.7198	0.7198
66	B	G_C1_L1	7124.1	198.418	0.2298	0.766	0.766
66	B	G_C2_L4	5388.02	150.065	0.1738	0.5794	0.5794
66	B	G_C2_L3	9207.01	256.43	0.297	0.99	0.99
66	B	G_C1_L3	8182.15	227.886	0.2639	0.8798	0.8798
67	B	G_C2_L3	7529.76	209.716	0.2429	0.8097	0.8097
67	B	G_C0_L2	789.567	21.9907	0.0255	0.0849	0.0849
67	B	G_C1_L2	6673.23	185.86	0.2153	0.7176	0.7176
67	B	G_C2_L2	4880.29	135.924	0.1574	0.5248	0.5248
67	B	G_C2_L0	6299.74	175.458	0.2032	0.6774	0.6774
67	B	G_C1_L1	6200.51	172.694	0.2	0.6667	0.6667
68	B	G_C2_L4	8525.15	237.439	0.275	0.9167	0.9167
68	B	G_C2_L0	3546.28	98.7695	0.1144	0.3813	0.3813
68	B	G_C2_L3	5338.13	148.676	0.1722	0.574	0.574
68	B	G_C1_L2	7953.03	221.505	0.2565	0.8552	0.8552
68	B	G_C0_L0	9071.66	252.66	0.2926	0.9754	0.9754
69	B	G_C2_L4	5856.67	163.118	0.1889	0.6297	0.6297
69	B	G_C1_L1	7944.77	221.275	0.2563	0.8543	0.8543
69	B	G_C0_L3	7840.19	218.362	0.2529	0.843	0.843
69	B	G_C0_L2	3969.98	110.57	0.1281	0.4269	0.4269
69	B	G_C1_L2	9236.75	257.258	0.298	0.9932	0.9932

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
69	B	G_C0_L0	7517.21	209.366	0.2425	0.8083	0.8083
69	B	G_C2_L1	9172.62	255.472	0.2959	0.9863	0.9863
69	B	G_C1_L3	6342.9	176.66	0.2046	0.682	0.682
70	B	G_C1_L4	3253.17	90.6061	0.1049	0.3498	0.3498
70	B	G_C2_L1	8470.84	235.927	0.2733	0.9108	0.9108
70	B	G_C0_L1	8834.11	246.044	0.285	0.9499	0.9499
70	B	G_C1_L2	2572.49	71.648	0.083	0.2766	0.2766
70	B	G_C1_L0	2208.26	61.5037	0.0712	0.2374	0.2374
70	B	G_C0_L4	4155.82	115.746	0.1341	0.4469	0.4469
70	B	G_C0_L3	7346.92	204.624	0.237	0.79	0.79
70	B	G_C1_L1	6214.02	173.071	0.2005	0.6682	0.6682
71	B	G_C1_L0	9102.18	253.511	0.2936	0.9787	0.9787
71	B	G_C0_L0	9190.08	255.958	0.2965	0.9882	0.9882
71	B	G_C2_L1	7294.14	203.154	0.2353	0.7843	0.7843
71	B	G_C0_L4	5187.57	144.482	0.1673	0.5578	0.5578
71	B	G_C1_L1	8523.87	237.404	0.275	0.9165	0.9165
71	B	G_C2_L2	5436.58	151.417	0.1754	0.5846	0.5846
71	B	G_C1_L3	6392.44	178.04	0.2062	0.6874	0.6874
71	B	G_C0_L3	5751.35	160.184	0.1855	0.6184	0.6184
71	B	G_C0_L2	1936.35	53.9306	0.0625	0.2082	0.2082
72	B	G_C2_L3	6704.2	186.723	0.2163	0.7209	0.7209
72	B	G_C1_L3	6765.75	188.437	0.2183	0.7275	0.7275
72	B	G_C1_L2	4585.78	127.722	0.1479	0.4931	0.4931
72	B	G_C1_L0	7285.9	202.924	0.235	0.7834	0.7834
72	B	G_C2_L0	7065.09	196.774	0.2279	0.7597	0.7597
72	B	G_C2_L2	6947.58	193.501	0.2241	0.7471	0.7471
72	B	G_C2_L4	1650.34	45.9646	0.0532	0.1775	0.1775
73	B	G_C0_L2	3063.64	85.3272	0.0988	0.3294	0.3294
73	B	G_C1_L2	5395.43	150.271	0.174	0.5802	0.5802
73	B	G_C1_L1	3923.94	109.288	0.1266	0.4219	0.4219
73	B	G_C0_L3	4884.69	136.046	0.1576	0.5252	0.5252
73	B	G_C0_L1	8636.91	240.552	0.2786	0.9287	0.9287
74	B	G_C2_L1	6190.72	172.422	0.1997	0.6657	0.6657
74	B	G_C0_L1	5470.16	152.353	0.1765	0.5882	0.5882
74	B	G_C2_L0	6496.65	180.942	0.2096	0.6986	0.6986
74	B	G_C1_L0	8326.41	231.904	0.2686	0.8953	0.8953
74	B	G_C2_L4	5899.91	164.322	0.1903	0.6344	0.6344
75	B	G_C0_L4	9090.24	253.178	0.2932	0.9774	0.9774
75	B	G_C1_L3	8921.34	248.474	0.2878	0.9593	0.9593
75	B	G_C0_L0	7757.73	216.065	0.2502	0.8342	0.8342
75	B	G_C1_L2	4178	116.364	0.1348	0.4492	0.4492
75	B	G_C2_L2	5486.44	152.806	0.177	0.5899	0.5899
75	B	G_C2_L0	6068.83	169.027	0.1958	0.6526	0.6526
75	B	G_C1_L1	5254.66	146.351	0.1695	0.565	0.565
75	B	G_C0_L3	7669.83	213.617	0.2474	0.8247	0.8247
76	B	G_C0_L0	4370.17	121.716	0.141	0.4699	0.4699
76	B	G_C0_L2	8203.39	228.478	0.2646	0.8821	0.8821
76	B	G_C0_L3	5289.5	147.321	0.1706	0.5688	0.5688
76	B	G_C1_L0	5158.49	143.672	0.1664	0.5547	0.5547
76	B	G_C0_L1	4260.41	118.659	0.1374	0.4581	0.4581
76	B	G_C2_L2	6884.71	191.75	0.2221	0.7403	0.7403
76	B	G_C0_L4	8355.89	232.725	0.2695	0.8985	0.8985
76	B	G_C2_L1	6436	179.253	0.2076	0.692	0.692
77	B	G_C0_L4	7760.05	216.13	0.2503	0.8344	0.8344
77	B	G_C0_L0	7340.35	204.44	0.2368	0.7893	0.7893
77	B	G_C1_L0	7470.9	208.077	0.241	0.8033	0.8033
77	B	G_C1_L1	6710.04	186.886	0.2165	0.7215	0.7215
77	B	G_C0_L1	7689.15	214.155	0.248	0.8268	0.8268
77	B	G_C2_L3	8092.94	225.401	0.2611	0.8702	0.8702
77	B	G_C1_L4	9228.15	257.019	0.2977	0.9923	0.9923
77	B	G_C0_L2	8696.57	242.214	0.2805	0.9351	0.9351
77	B	G_C2_L1	4460.92	124.244	0.1439	0.4797	0.4797
78	B	G_C1_L1	4076.34	113.533	0.1315	0.4383	0.4383
78	B	G_C2_L0	6367.58	177.347	0.2054	0.6847	0.6847
78	B	G_C0_L2	7281.85	202.811	0.2349	0.783	0.783
78	B	G_C1_L4	6083.73	169.442	0.1962	0.6542	0.6542
78	B	G_C2_L3	8503.09	236.825	0.2743	0.9143	0.9143
78	B	G_C2_L1	8088.46	225.277	0.2609	0.8697	0.8697

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	mm	N_m3	m_m	or_D
78	B	G_C0_L3	8729.91	243.142	0.2816	0.9387	0.9387
78	B	G_C1_L3	4806.53	133.869	0.155	0.5168	0.5168
78	B	G_C0_L0	6558.97	182.678	0.2116	0.7053	0.7053
79	B	G_C2_L4	5858.71	163.174	0.189	0.63	0.63
79	B	G_C2_L0	7522.42	209.512	0.2427	0.8089	0.8089
79	B	G_C2_L2	8541.1	237.883	0.2755	0.9184	0.9184
79	B	G_C0_L2	8237.76	229.435	0.2657	0.8858	0.8858
79	B	G_C1_L0	6178.61	172.084	0.1993	0.6644	0.6644
79	B	G_C1_L2	8204.25	228.502	0.2647	0.8822	0.8822
79	B	G_C0_L1	7207.18	200.732	0.2325	0.775	0.775
80	B	G_C2_L2	8568.28	238.64	0.2764	0.9213	0.9213
80	B	G_C2_L0	7292.03	203.095	0.2352	0.7841	0.7841
80	B	G_C1_L2	5647.07	157.28	0.1822	0.6072	0.6072
80	B	G_C2_L4	6326.28	176.197	0.2041	0.6802	0.6802
80	B	G_C2_L3	7208.55	200.77	0.2325	0.7751	0.7751
80	B	G_C2_L1	3337.05	92.9421	0.1076	0.3588	0.3588
80	B	G_C1_L1	1942.66	54.1061	0.0627	0.2089	0.2089
80	B	G_C1_L3	8884.22	247.44	0.2866	0.9553	0.9553
80	B	G_C1_L4	5142.93	143.239	0.1659	0.553	0.553
81	B	G_C1_L3	6673.2	185.859	0.2153	0.7175	0.7175
81	B	G_C0_L4	9160.13	255.124	0.2955	0.985	0.985
81	B	G_C2_L0	5517.4	153.668	0.178	0.5933	0.5933
81	B	G_C1_L1	5247.64	146.155	0.1693	0.5643	0.5643
81	B	G_C1_L2	8594.93	239.383	0.2773	0.9242	0.9242
81	B	G_C2_L3	6205.39	172.83	0.2002	0.6672	0.6672
81	B	G_C0_L2	7772.84	216.486	0.2507	0.8358	0.8358
82	B	G_C0_L1	9027.09	251.419	0.2912	0.9707	0.9707
82	B	G_C1_L0	5141.74	143.206	0.1659	0.5529	0.5529
82	B	G_C0_L3	3881.71	108.112	0.1252	0.4174	0.4174
82	B	G_C1_L1	5525.06	153.882	0.1782	0.5941	0.5941
82	B	G_C0_L0	8877.75	247.26	0.2864	0.9546	0.9546
82	B	G_C2_L2	9232.05	257.127	0.2978	0.9927	0.9927
82	B	G_C2_L4	6202.54	172.751	0.2001	0.6669	0.6669
82	B	G_C1_L2	8691.71	242.078	0.2804	0.9346	0.9346
82	B	G_C1_L4	7973.56	222.077	0.2572	0.8574	0.8574
83	B	G_C2_L3	4294.65	119.613	0.1385	0.4618	0.4618
83	B	G_C0_L0	6902.22	192.238	0.2227	0.7422	0.7422
83	B	G_C2_L2	4063.09	113.164	0.1311	0.4369	0.4369
83	B	G_C0_L2	8166.19	227.441	0.2634	0.8781	0.8781
83	B	G_C2_L1	6595.27	183.689	0.2128	0.7092	0.7092
84	B	G_C2_L2	6672.01	185.826	0.2152	0.7174	0.7174
84	B	G_C1_L3	6150.46	171.3	0.1984	0.6613	0.6613
84	B	G_C0_L3	6808.96	189.641	0.2196	0.7321	0.7321
84	B	G_C0_L1	7007.43	195.168	0.226	0.7535	0.7535
84	B	G_C1_L0	5342.48	148.797	0.1723	0.5745	0.5745
84	B	G_C2_L0	1020.05	28.41	0.0329	0.1097	0.1097
85	B	G_C1_L1	3130.35	87.1854	0.101	0.3366	0.3366
85	B	G_C2_L0	7206.92	200.724	0.2325	0.7749	0.7749
85	B	G_C0_L3	7289.38	203.021	0.2351	0.7838	0.7838
85	B	G_C0_L2	3414.23	95.0918	0.1101	0.3671	0.3671
85	B	G_C2_L4	6574.69	183.116	0.2121	0.707	0.707
85	B	G_C1_L3	3605.36	100.415	0.1163	0.3877	0.3877
85	B	G_C0_L0	8777.17	244.458	0.2831	0.9438	0.9438
85	B	G_C2_L3	9282.11	258.522	0.2994	0.9981	0.9981
85	B	G_C1_L2	6062.25	168.843	0.1956	0.6519	0.6519
86	B	G_C1_L2	7849.91	218.633	0.2532	0.8441	0.8441
86	B	G_C0_L4	9016.46	251.123	0.2909	0.9695	0.9695
86	B	G_C0_L0	7661.98	213.399	0.2472	0.8239	0.8239
86	B	G_C1_L1	8698.2	242.259	0.2806	0.9353	0.9353
86	B	G_C2_L1	2669.45	74.3486	0.0861	0.287	0.287
86	B	G_C2_L4	6910.05	192.456	0.2229	0.743	0.743
86	B	G_C0_L1	3234.77	90.0935	0.1043	0.3478	0.3478
86	B	G_C2_L0	6161.75	171.615	0.1988	0.6626	0.6626
86	B	G_C1_L0	7655.79	213.226	0.247	0.8232	0.8232
87	B	G_C2_L4	6961.95	193.902	0.2246	0.7486	0.7486
87	B	G_C1_L1	8255.12	229.918	0.2663	0.8876	0.8876
87	B	G_C0_L2	7486.43	208.509	0.2415	0.805	0.805
87	B	G_C0_L4	5197.63	144.762	0.1677	0.5589	0.5589

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
87	B	G_C2_L3	8321.69	231.772	0.2684	0.8948	0.8948
87	B	G_C1_L3	7642.7	212.861	0.2465	0.8218	0.8218
87	B	G_C2_L1	7659.35	213.325	0.2471	0.8236	0.8236
88	B	G_C1_L4	6718.92	187.133	0.2167	0.7225	0.7225
88	B	G_C2_L2	5938.26	165.39	0.1916	0.6385	0.6385
88	B	G_C1_L2	7755.99	216.017	0.2502	0.834	0.834
88	B	G_C2_L0	4921.85	137.081	0.1588	0.5292	0.5292
88	B	G_C0_L4	5385.74	150.001	0.1737	0.5791	0.5791
88	B	G_C2_L1	6291.92	175.24	0.203	0.6766	0.6766
88	B	G_C0_L0	3236.17	90.1325	0.1044	0.348	0.348
89	B	G_C0_L2	782.662	21.7984	0.0252	0.0842	0.0842
89	B	G_C1_L3	8898.75	247.844	0.2871	0.9569	0.9569
89	B	G_C2_L3	6398.87	178.219	0.2064	0.6881	0.6881
89	B	G_C1_L4	6504.06	181.149	0.2098	0.6994	0.6994
89	B	G_C2_L2	2912.65	81.122	0.094	0.3132	0.3132
89	B	G_C0_L0	6846.87	190.696	0.2209	0.7362	0.7362
89	B	G_C1_L2	7518.01	209.389	0.2425	0.8084	0.8084
90	B	G_C2_L3	5230.42	145.676	0.1687	0.5624	0.5624
90	B	G_C0_L3	9190.4	255.967	0.2965	0.9882	0.9882
90	B	G_C1_L0	2052.08	57.1537	0.0662	0.2207	0.2207
90	B	G_C1_L3	6390.09	177.974	0.2061	0.6871	0.6871
90	B	G_C0_L2	7301.95	203.371	0.2355	0.7852	0.7852
90	B	G_C0_L0	2458.85	68.483	0.0793	0.2644	0.2644
90	B	G_C0_L1	8190.72	228.125	0.2642	0.8807	0.8807
90	B	G_C1_L4	8796.44	244.995	0.2838	0.9459	0.9459
91	B	G_C2_L0	2361.87	65.7819	0.0762	0.254	0.254
91	B	G_C0_L1	7988.05	222.48	0.2577	0.8589	0.8589
91	B	G_C2_L3	5859.08	163.185	0.189	0.63	0.63
91	B	G_C2_L2	9027.79	251.438	0.2912	0.9707	0.9707
91	B	G_C1_L2	5621.82	156.577	0.1813	0.6045	0.6045
91	B	G_C2_L1	3753.83	104.55	0.1211	0.4036	0.4036
91	B	G_C0_L2	7622.9	212.31	0.2459	0.8197	0.8197
91	B	G_C0_L0	8248.31	229.729	0.2661	0.8869	0.8869
92	B	G_C1_L4	3967.96	110.514	0.128	0.4267	0.4267
92	B	G_C1_L2	7816.61	217.705	0.2521	0.8405	0.8405
92	B	G_C2_L4	9075.83	252.777	0.2928	0.9759	0.9759
92	B	G_C0_L3	9000.46	250.677	0.2903	0.9678	0.9678
92	B	G_C2_L1	5162.06	143.772	0.1665	0.5551	0.5551
92	B	G_C1_L1	8986.79	250.297	0.2899	0.9663	0.9663
93	B	G_C2_L1	6715.1	187.026	0.2166	0.7221	0.7221
93	B	G_C2_L0	9120.32	254.016	0.2942	0.9807	0.9807
93	B	G_C2_L4	3000.4	83.566	0.0968	0.3226	0.3226
93	B	G_C1_L3	3357.4	93.5091	0.1083	0.361	0.361
93	B	G_C2_L3	8576.78	238.877	0.2767	0.9222	0.9222
93	B	G_C0_L0	4577.06	127.479	0.1476	0.4922	0.4922
94	B	G_C1_L0	5019.48	139.801	0.1619	0.5397	0.5397
94	B	G_C0_L1	5119.27	142.58	0.1651	0.5505	0.5505
94	B	G_C2_L1	6580.46	183.276	0.2123	0.7076	0.7076
94	B	G_C0_L4	7450.23	207.501	0.2403	0.8011	0.8011
94	B	G_C2_L4	5874.4	163.611	0.1895	0.6317	0.6317
94	B	G_C1_L2	6558.34	182.66	0.2116	0.7052	0.7052
94	B	G_C0_L0	8365.96	233.006	0.2699	0.8996	0.8996
94	B	G_C0_L3	7130.99	198.61	0.23	0.7668	0.7668
95	B	G_C2_L1	9018.04	251.167	0.2909	0.9697	0.9697
95	B	G_C0_L3	7437.99	207.16	0.2399	0.7998	0.7998
95	B	G_C1_L3	6834.44	190.35	0.2205	0.7349	0.7349
95	B	G_C1_L4	7250.65	201.942	0.2339	0.7796	0.7796
95	B	G_C1_L2	6958.8	193.814	0.2245	0.7483	0.7483
95	B	G_C2_L4	6502.1	181.094	0.2097	0.6992	0.6992
95	B	G_C2_L2	8660.06	241.197	0.2794	0.9312	0.9312
95	B	G_C0_L4	7043.24	196.166	0.2272	0.7573	0.7573
95	B	G_C2_L3	7380.72	205.565	0.2381	0.7936	0.7936
96	B	G_C0_L3	5857.83	163.15	0.189	0.6299	0.6299
96	B	G_C0_L1	6600.09	183.823	0.2129	0.7097	0.7097
96	B	G_C0_L0	6773.22	188.645	0.2185	0.7283	0.7283
96	B	G_C2_L0	6436.12	179.256	0.2076	0.6921	0.6921
96	B	G_C1_L2	5814.75	161.95	0.1876	0.6252	0.6252
96	B	G_C2_L2	6740.43	187.732	0.2174	0.7248	0.7248

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
97	B	G_C2_L1	3514.95	97.8971	0.1134	0.378	0.378
97	B	G_C0_L0	7358.86	204.956	0.2374	0.7913	0.7913
97	B	G_C2_L3	6810.44	189.682	0.2197	0.7323	0.7323
97	B	G_C2_L4	8821.01	245.679	0.2845	0.9485	0.9485
97	B	G_C1_L4	6691.42	186.367	0.2159	0.7195	0.7195
97	B	G_C1_L2	3637.88	101.321	0.1174	0.3912	0.3912
98	B	G_C0_L4	7893.82	219.856	0.2546	0.8488	0.8488
98	B	G_C2_L1	5939.1	165.413	0.1916	0.6386	0.6386
98	B	G_C0_L0	3119.24	86.8758	0.1006	0.3354	0.3354
98	B	G_C0_L1	8069.82	224.757	0.2603	0.8677	0.8677
98	B	G_C2_L3	448.082	12.4798	0.0145	0.0482	0.0482
98	B	G_C2_L4	6640.93	184.961	0.2142	0.7141	0.7141
99	B	G_C0_L1	8805.07	245.236	0.284	0.9468	0.9468
99	B	G_C1_L1	3389.98	94.4164	0.1094	0.3645	0.3645
99	B	G_C2_L3	3109.88	86.6151	0.1003	0.3344	0.3344
99	B	G_C2_L4	7682.86	213.98	0.2478	0.8261	0.8261
99	B	G_C1_L3	9079.58	252.881	0.2929	0.9763	0.9763
100	B	G_C1_L4	6647.44	185.142	0.2144	0.7148	0.7148
100	B	G_C2_L4	7271	202.509	0.2345	0.7818	0.7818
100	B	G_C0_L3	6165.95	171.732	0.1989	0.663	0.663
100	B	G_C2_L1	8188.82	228.072	0.2642	0.8805	0.8805
100	B	G_C1_L2	7639.47	212.772	0.2464	0.8214	0.8214

C.3.22 stochastic_traceability_log_GSHS_C.csv

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
1	C	D_R_BOT	3075.22	85.6499	0.0992	0.3307	0.3307
4	C	D_L_BOT	7279.99	202.759	0.2348	0.7828	0.7828
5	C	D_R_BOT	7395.17	205.967	0.2386	0.7952	0.7952
7	C	D_R_BOT	2738.49	76.2715	0.0883	0.2945	0.2945
8	C	D_L_BOT	3069.73	85.497	0.099	0.3301	0.3301
9	C	D_L_BOT	3647	101.575	0.1176	0.3922	0.3922
11	C	D_L_BOT	9211.04	256.542	0.2971	0.9904	0.9904
13	C	D_L_BOT	4324.38	120.441	0.1395	0.465	0.465
14	C	D_L_BOT	6771.34	188.593	0.2184	0.7281	0.7281
15	C	D_L_BOT	4848.24	135.031	0.1564	0.5213	0.5213
16	C	D_L_BOT	8661.31	241.232	0.2794	0.9313	0.9313
19	C	D_L_BOT	8131.24	226.468	0.2623	0.8743	0.8743
22	C	D_L_BOT	8810.5	245.387	0.2842	0.9474	0.9474
23	C	D_L_BOT	1146.62	31.9353	0.037	0.1233	0.1233
25	C	D_R_BOT	5736.48	159.77	0.185	0.6168	0.6168
30	C	D_L_BOT	6989.31	194.664	0.2255	0.7515	0.7515
31	C	D_R_BOT	3262.05	90.8534	0.1052	0.3508	0.3508
34	C	D_R_BOT	8679.22	241.73	0.28	0.9332	0.9332
35	C	D_R_BOT	4198.05	116.922	0.1354	0.4514	0.4514
40	C	D_R_BOT	8226.15	229.112	0.2654	0.8845	0.8845
42	C	D_L_BOT	7544.13	210.116	0.2434	0.8112	0.8112
45	C	D_R_BOT	6520.28	181.6	0.2103	0.7011	0.7011
46	C	D_R_BOT	7884.3	219.59	0.2543	0.8478	0.8478
47	C	D_L_BOT	6127.72	170.667	0.1977	0.6589	0.6589
52	C	D_L_BOT	8282.04	230.668	0.2672	0.8905	0.8905
54	C	D_L_BOT	7754.38	215.972	0.2501	0.8338	0.8338
58	C	D_L_BOT	4651.3	129.546	0.15	0.5001	0.5001
66	C	D_L_BOT	9241.24	257.384	0.2981	0.9937	0.9937
67	C	D_L_BOT	7837.38	218.284	0.2528	0.8427	0.8427
68	C	D_L_BOT	6895.61	192.054	0.2224	0.7415	0.7415
72	C	D_L_BOT	5280.46	147.069	0.1703	0.5678	0.5678
73	C	D_R_BOT	3819.79	106.387	0.1232	0.4107	0.4107
77	C	D_L_BOT	5430.71	151.254	0.1752	0.5839	0.5839
81	C	D_L_BOT	3463.2	96.4556	0.1117	0.3724	0.3724
83	C	D_L_BOT	4650.44	129.522	0.15	0.5	0.5
85	C	D_L_BOT	6506.09	181.205	0.2099	0.6996	0.6996
86	C	D_R_BOT	4454.54	124.066	0.1437	0.479	0.479
90	C	D_L_BOT	7468.91	208.021	0.2409	0.8031	0.8031
92	C	D_R_BOT	7215.27	200.957	0.2328	0.7758	0.7758

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
93	C	D_L_BOT	9007.82	250.882	0.2906	0.9686	0.9686
97	C	D_L_BOT	7593.47	211.49	0.245	0.8165	0.8165
98	C	D_L_BOT	2664.11	74.1998	0.0859	0.2865	0.2865
99	C	D_L_BOT	6887.67	191.833	0.2222	0.7406	0.7406

C.3.23 stochastic_traceability_log_GSHS_D.csv

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
1	D	L_B_1	8736.51	243.326	0.2818	0.9394	0.9394
1	D	L_F_3	7973.13	222.065	0.2572	0.8573	0.8573
1	D	L_F_1	6333.03	176.385	0.2043	0.681	0.681
2	D	L_F_5	8796.59	244.999	0.2838	0.9459	0.9459
2	D	L_F_4	5819.68	162.087	0.1877	0.6258	0.6258
2	D	L_B_2	8616.06	239.971	0.2779	0.9265	0.9265
3	D	L_F_1	4808.45	133.923	0.1551	0.517	0.517
3	D	L_F_2	6000.03	167.111	0.1935	0.6452	0.6452
3	D	L_B_1	4228.16	117.761	0.1364	0.4546	0.4546
4	D	L_B_5	5573.43	155.229	0.1798	0.5993	0.5993
4	D	L_B_4	6469.58	180.188	0.2087	0.6957	0.6957
4	D	L_B_2	7101.25	197.781	0.2291	0.7636	0.7636
5	D	L_B_4	7070.28	196.919	0.2281	0.7602	0.7602
6	D	L_F_4	7120.39	198.315	0.2297	0.7656	0.7656
6	D	L_B_4	4414.8	122.959	0.1424	0.4747	0.4747
7	D	L_B_2	6936.35	193.189	0.2238	0.7458	0.7458
7	D	L_F_4	8655.71	241.075	0.2792	0.9307	0.9307
8	D	L_B_4	7199.71	200.524	0.2322	0.7742	0.7742
8	D	L_F_4	8150.24	226.997	0.2629	0.8764	0.8764
9	D	L_F_4	5423.51	151.054	0.175	0.5832	0.5832
10	D	L_F_4	8749.28	243.681	0.2822	0.9408	0.9408
10	D	L_B_1	5465.69	152.228	0.1763	0.5877	0.5877
11	D	L_F_5	6174.41	171.967	0.1992	0.6639	0.6639
11	D	L_F_1	7544.06	210.114	0.2434	0.8112	0.8112
11	D	L_F_4	5771.88	160.756	0.1862	0.6206	0.6206
12	D	L_F_5	3168.56	88.2496	0.1022	0.3407	0.3407
12	D	L_B_2	3998.53	111.365	0.129	0.4299	0.4299
13	D	L_F_1	6432.12	179.145	0.2075	0.6916	0.6916
13	D	L_B_3	6664.94	185.629	0.215	0.7167	0.7167
14	D	L_F_5	7437.44	207.145	0.2399	0.7997	0.7997
14	D	L_B_2	5850.08	162.934	0.1887	0.629	0.629
15	D	L_F_1	7964.86	221.834	0.2569	0.8564	0.8564
15	D	L_F_3	7856.36	218.812	0.2534	0.8448	0.8448
15	D	L_B_4	8941.69	249.04	0.2884	0.9615	0.9615
16	D	L_B_2	7202.57	200.603	0.2323	0.7745	0.7745
16	D	L_B_5	9153.36	254.936	0.2953	0.9842	0.9842
17	D	L_B_2	6779.02	188.807	0.2187	0.7289	0.7289
18	D	L_F_1	7740.67	215.59	0.2497	0.8323	0.8323
19	D	L_B_4	7453	207.578	0.2404	0.8014	0.8014
19	D	L_B_3	6311.83	175.795	0.2036	0.6787	0.6787
20	D	L_B_5	6179.27	172.103	0.1993	0.6644	0.6644
21	D	L_F_2	8269.24	230.312	0.2667	0.8892	0.8892
21	D	L_B_2	8499.71	236.731	0.2742	0.9139	0.9139
21	D	L_B_1	6481.05	180.508	0.2091	0.6969	0.6969
22	D	L_B_4	9150.63	254.86	0.2952	0.9839	0.9839
22	D	L_F_3	7039.22	196.054	0.2271	0.7569	0.7569
23	D	L_B_2	9221.58	256.836	0.2975	0.9916	0.9916
23	D	L_F_5	3427.7	95.467	0.1106	0.3686	0.3686
23	D	L_B_3	7043.81	196.181	0.2272	0.7574	0.7574
24	D	L_B_3	7423.35	206.752	0.2395	0.7982	0.7982
24	D	L_B_2	3515.83	97.9217	0.1134	0.378	0.378
25	D	L_B_1	6283.87	175.016	0.2027	0.6757	0.6757
25	D	L_B_2	5443.38	151.607	0.1756	0.5853	0.5853
26	D	L_B_3	9106.98	253.644	0.2938	0.9792	0.9792
26	D	L_F_5	6745.19	187.864	0.2176	0.7253	0.7253
26	D	L_B_2	1632.49	45.4676	0.0527	0.1755	0.1755
27	D	L_F_1	4621.63	128.72	0.1491	0.4969	0.4969

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	_mm	N_m3	_m_m	or_D
27	D	L_B_3	6419.96	178.806	0.2071	0.6903	0.6903
28	D	L_B_5	3116.65	86.8038	0.1005	0.3351	0.3351
28	D	L_F_1	8897.17	247.8	0.287	0.9567	0.9567
28	D	L_B_2	9190.95	255.983	0.2965	0.9883	0.9883
29	D	L_B_4	6922.36	192.799	0.2233	0.7443	0.7443
30	D	L_B_3	6314.33	175.864	0.2037	0.679	0.679
31	D	L_F_5	3489.7	97.1937	0.1126	0.3752	0.3752
32	D	L_B_3	4710.17	131.186	0.1519	0.5065	0.5065
32	D	L_F_1	8364.89	232.976	0.2698	0.8995	0.8995
32	D	L_B_1	9148.2	254.792	0.2951	0.9837	0.9837
33	D	L_B_1	5502.95	153.266	0.1775	0.5917	0.5917
33	D	L_B_2	7836.05	218.246	0.2528	0.8426	0.8426
34	D	L_B_4	7789.78	216.958	0.2513	0.8376	0.8376
35	D	L_F_4	7913.57	220.406	0.2553	0.8509	0.8509
36	D	L_F_4	2786.88	77.6191	0.0899	0.2997	0.2997
37	D	L_B_5	7445.26	207.363	0.2402	0.8006	0.8006
38	D	L_B_5	8020.84	223.393	0.2587	0.8625	0.8625
38	D	L_B_3	7708.73	214.701	0.2487	0.8289	0.8289
38	D	L_F_4	7574.6	210.965	0.2443	0.8145	0.8145
39	D	L_F_3	9140.64	254.582	0.2949	0.9829	0.9829
39	D	L_B_1	4522.92	125.971	0.1459	0.4863	0.4863
39	D	L_F_1	7934.29	220.983	0.2559	0.8531	0.8531
40	D	L_B_3	7125.22	198.449	0.2298	0.7662	0.7662
41	D	L_B_1	7664.21	213.461	0.2472	0.8241	0.8241
42	D	L_F_1	7278.73	202.724	0.2348	0.7827	0.7827
42	D	L_B_5	4174.27	116.26	0.1347	0.4488	0.4488
42	D	L_F_4	9141.37	254.602	0.2949	0.9829	0.9829
43	D	L_B_1	3853.22	107.318	0.1243	0.4143	0.4143
43	D	L_F_2	5220.01	145.386	0.1684	0.5613	0.5613
44	D	L_B_4	7206.15	200.703	0.2325	0.7749	0.7749
44	D	L_F_5	2828.75	78.7854	0.0913	0.3042	0.3042
45	D	L_F_1	4078.91	113.604	0.1316	0.4386	0.4386
45	D	L_F_4	8642.39	240.704	0.2788	0.9293	0.9293
45	D	L_F_3	5967.27	166.198	0.1925	0.6416	0.6416
46	D	L_B_5	7925.87	220.748	0.2557	0.8522	0.8522
46	D	L_B_1	5607.97	156.191	0.1809	0.603	0.603
47	D	L_F_1	9102.85	253.529	0.2936	0.9788	0.9788
47	D	L_B_2	7774.56	216.534	0.2508	0.836	0.836
47	D	L_F_2	7053.07	196.439	0.2275	0.7584	0.7584
48	D	L_F_4	8679.38	241.735	0.28	0.9333	0.9333
48	D	L_B_4	8424.48	234.635	0.2718	0.9059	0.9059
49	D	L_B_4	8357.63	232.773	0.2696	0.8987	0.8987
49	D	L_B_2	6457.02	179.839	0.2083	0.6943	0.6943
49	D	L_F_3	7934.48	220.988	0.256	0.8532	0.8532
50	D	L_B_3	5087.26	141.688	0.1641	0.547	0.547
50	D	L_F_3	6574.26	183.104	0.2121	0.7069	0.7069
50	D	L_B_2	6525.07	181.734	0.2105	0.7016	0.7016
51	D	L_F_1	5803.75	161.644	0.1872	0.6241	0.6241
51	D	L_F_3	3956.16	110.186	0.1276	0.4254	0.4254
52	D	L_F_1	4701.6	130.947	0.1517	0.5055	0.5055
53	D	L_B_1	6525.36	181.742	0.2105	0.7017	0.7017
54	D	L_B_4	7467.4	207.979	0.2409	0.8029	0.8029
54	D	L_F_5	8747.91	243.643	0.2822	0.9406	0.9406
54	D	L_B_1	9162.57	255.192	0.2956	0.9852	0.9852
55	D	L_F_2	5191.51	144.592	0.1675	0.5582	0.5582
55	D	L_F_3	3740.57	104.181	0.1207	0.4022	0.4022
55	D	L_F_5	3133.55	87.2743	0.1011	0.3369	0.3369
56	D	L_B_1	4772.45	132.921	0.154	0.5132	0.5132
56	D	L_F_3	576.359	16.0525	0.0186	0.062	0.062
57	D	L_B_2	7207.41	200.738	0.2325	0.775	0.775
57	D	L_F_4	1992.37	55.4907	0.0643	0.2142	0.2142
58	D	L_B_4	3699.23	103.029	0.1193	0.3978	0.3978
58	D	L_F_1	5790.1	161.264	0.1868	0.6226	0.6226
59	D	L_B_5	5214.05	145.22	0.1682	0.5607	0.5607
59	D	L_B_2	4749.72	132.287	0.1532	0.5107	0.5107
59	D	L_B_4	4234.22	117.93	0.1366	0.4553	0.4553
60	D	L_B_1	8123.64	226.256	0.2621	0.8735	0.8735
61	D	L_F_3	8728.53	243.103	0.2816	0.9386	0.9386

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	mm	N_m3	m_m	or_D
61	D	L_F_2	1231.78	34.3071	0.0397	0.1324	0.1324
62	D	L_B_2	8341.69	232.33	0.2691	0.897	0.897
63	D	L_B_5	5661.13	157.672	0.1826	0.6087	0.6087
64	D	L_B_2	8149.39	226.974	0.2629	0.8763	0.8763
64	D	L_F_3	6935.24	193.157	0.2237	0.7457	0.7457
64	D	L_F_2	1054.68	29.3745	0.034	0.1134	0.1134
65	D	L_F_5	7584.43	211.238	0.2447	0.8155	0.8155
65	D	L_F_1	8453.75	235.451	0.2727	0.909	0.909
65	D	L_F_2	8412.52	234.302	0.2714	0.9046	0.9046
66	D	L_B_1	1913.55	53.2953	0.0617	0.2058	0.2058
66	D	L_F_1	4363.19	121.522	0.1407	0.4692	0.4692
66	D	L_F_3	7588	211.338	0.2448	0.8159	0.8159
67	D	L_F_4	4258.56	118.608	0.1374	0.4579	0.4579
67	D	L_B_5	6610.43	184.111	0.2132	0.7108	0.7108
68	D	L_F_5	4378.59	121.951	0.1412	0.4708	0.4708
69	D	L_F_1	2559.12	71.2756	0.0826	0.2752	0.2752
69	D	L_B_2	9120.27	254.014	0.2942	0.9807	0.9807
69	D	L_F_4	6633.89	184.765	0.214	0.7133	0.7133
70	D	L_F_1	5999.22	167.088	0.1935	0.6451	0.6451
70	D	L_B_5	5581.76	155.461	0.1801	0.6002	0.6002
70	D	L_F_4	3574.32	99.5507	0.1153	0.3843	0.3843
71	D	L_F_5	7293.66	203.14	0.2353	0.7843	0.7843
72	D	L_B_1	8761.16	244.012	0.2826	0.9421	0.9421
73	D	L_B_3	6981.64	194.45	0.2252	0.7507	0.7507
74	D	L_F_2	9220.58	256.808	0.2974	0.9915	0.9915
75	D	L_B_5	4891.53	136.237	0.1578	0.526	0.526
76	D	L_F_3	7588.51	211.352	0.2448	0.816	0.816
77	D	L_F_2	8610.1	239.805	0.2777	0.9258	0.9258
78	D	L_F_1	8268.97	230.304	0.2667	0.8891	0.8891
78	D	L_F_2	7733.71	215.396	0.2495	0.8316	0.8316
78	D	L_B_5	6331.44	176.341	0.2042	0.6808	0.6808
79	D	L_B_3	4784.69	133.261	0.1543	0.5145	0.5145
79	D	L_F_4	8138.08	226.659	0.2625	0.8751	0.8751
80	D	L_B_2	4428.54	123.342	0.1429	0.4762	0.4762
80	D	L_B_5	6986.46	194.584	0.2254	0.7512	0.7512
81	D	L_B_1	3634.86	101.237	0.1173	0.3908	0.3908
81	D	L_F_3	7556.36	210.457	0.2438	0.8125	0.8125
81	D	L_B_4	8848.17	246.436	0.2854	0.9514	0.9514
82	D	L_B_4	4425.29	123.251	0.1428	0.4758	0.4758
82	D	L_B_2	7178.58	199.935	0.2316	0.7719	0.7719
82	D	L_B_1	1370.27	38.1642	0.0442	0.1473	0.1473
83	D	L_F_3	8879.61	247.311	0.2864	0.9548	0.9548
83	D	L_B_1	8718.49	242.824	0.2812	0.9375	0.9375
84	D	L_B_2	8696.02	242.198	0.2805	0.9351	0.9351
84	D	L_B_1	7325.09	204.016	0.2363	0.7876	0.7876
85	D	L_B_3	7721.8	215.065	0.2491	0.8303	0.8303
86	D	L_B_2	6489.14	180.733	0.2093	0.6978	0.6978
87	D	L_F_1	6838.16	190.454	0.2206	0.7353	0.7353
88	D	L_B_5	4336.76	120.786	0.1399	0.4663	0.4663
88	D	L_F_1	8704.48	242.434	0.2808	0.936	0.936
88	D	L_F_5	7469.4	208.035	0.2409	0.8032	0.8032
89	D	L_F_3	9095.96	253.337	0.2934	0.9781	0.9781
89	D	L_B_3	6776.91	188.748	0.2186	0.7287	0.7287
89	D	L_B_2	5202.28	144.892	0.1678	0.5594	0.5594
90	D	L_B_5	9172.75	255.476	0.2959	0.9863	0.9863
91	D	L_B_4	7996.51	222.716	0.258	0.8598	0.8598
91	D	L_F_4	9276.49	258.365	0.2992	0.9975	0.9975
91	D	L_F_1	7725.73	215.174	0.2492	0.8307	0.8307
92	D	L_B_2	5248.87	146.19	0.1693	0.5644	0.5644
92	D	L_F_5	8913.23	248.248	0.2875	0.9584	0.9584
92	D	L_F_2	7355.45	204.861	0.2373	0.7909	0.7909
93	D	L_F_5	4952.76	137.942	0.1598	0.5326	0.5326
94	D	L_F_4	8169.21	227.526	0.2635	0.8784	0.8784
95	D	L_F_5	4385.14	122.133	0.1415	0.4715	0.4715
96	D	L_B_3	2670.54	74.3788	0.0861	0.2872	0.2872
96	D	L_F_5	2803.78	78.0898	0.0904	0.3015	0.3015
97	D	L_B_4	3069.07	85.4784	0.099	0.33	0.33
97	D	L_F_3	8348.45	232.518	0.2693	0.8977	0.8977

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	_mm	N_m3	_m_m	or_D
97	D	L_F_4	7431.28	206.973	0.2397	0.7991	0.7991
98	D	L_B_3	6187.97	172.345	0.1996	0.6654	0.6654
98	D	L_F_3	3405.75	94.8556	0.1099	0.3662	0.3662
99	D	L_F_4	7565.45	210.71	0.244	0.8135	0.8135
99	D	L_B_1	8182.04	227.883	0.2639	0.8798	0.8798
99	D	L_F_2	35.8144	0.9975	0.0012	0.0039	0.0039
100	D	L_F_5	8253.95	229.886	0.2663	0.8875	0.8875
100	D	L_F_4	7240.14	201.65	0.2336	0.7785	0.7785

C.3.24 stochastic_traceability_log_GSHS_E.csv

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	_mm	N_m3	_m_m	or_D
1	E	G_C1_L0	8728.36	243.099	0.2816	0.9385	0.9385
1	E	G_C0_L21	8459.23	235.603	0.2729	0.9096	0.9096
1	E	G_C2_L0	8279.37	230.594	0.2671	0.8903	0.8903
1	E	G_C2_L21	9186.46	255.858	0.2963	0.9878	0.9878
1	E	G_C0_L1	6696.74	186.515	0.216	0.7201	0.7201
1	E	G_C1_L3	7936.6	221.047	0.256	0.8534	0.8534
1	E	G_C0_L3	3033.17	84.4787	0.0978	0.3261	0.3261
1	E	G_C0_L2	9288.03	258.687	0.2996	0.9987	0.9987
1	E	G_C1_L0	8996.21	250.559	0.2902	0.9673	0.9673
1	E	L_F_3	111.131	3.0952	0.0036	0.0119	0.0119
1	E	L_F_2	8079.08	225.015	0.2606	0.8687	0.8687
1	E	L_B_4	2808.31	78.216	0.0906	0.302	0.302
2	E	G_C0_L0	5216.65	145.292	0.1683	0.5609	0.5609
2	E	G_C1_L21	7144.02	198.972	0.2305	0.7682	0.7682
2	E	G_C0_L21	3525.71	98.1966	0.1137	0.3791	0.3791
2	E	G_C2_L21	8395.97	233.841	0.2708	0.9028	0.9028
2	E	G_C1_L0	6895.7	192.056	0.2224	0.7415	0.7415
2	E	G_C2_L4	7854.9	218.772	0.2534	0.8446	0.8446
2	E	G_C0_L1	6411.83	178.58	0.2068	0.6894	0.6894
2	E	G_C1_L3	9130.17	254.29	0.2945	0.9817	0.9817
2	E	G_C0_L4	6048.14	168.451	0.1951	0.6503	0.6503
2	E	G_C2_L0	6563.86	182.814	0.2117	0.7058	0.7058
2	E	G_C0_L3	6151.41	171.327	0.1984	0.6614	0.6614
2	E	G_C1_L4	6726.33	187.339	0.217	0.7233	0.7233
2	E	G_C2_L1	5283.59	147.157	0.1704	0.5681	0.5681
2	E	D_L_BOT	5608.96	156.219	0.1809	0.6031	0.6031
2	E	L_B_1	5362.23	149.347	0.173	0.5766	0.5766
2	E	L_F_3	3777.03	105.196	0.1218	0.4061	0.4061
3	E	G_C2_L21	7969.09	221.952	0.2571	0.8569	0.8569
3	E	G_C2_L0	7085.66	197.347	0.2286	0.7619	0.7619
3	E	G_C1_L0	8572.5	238.758	0.2765	0.9218	0.9218
3	E	G_C0_L21	2129.52	59.3107	0.0687	0.229	0.229
3	E	G_C2_L1	4939.07	137.561	0.1593	0.5311	0.5311
3	E	G_C2_L3	1203.36	33.5156	0.0388	0.1294	0.1294
3	E	G_C0_L4	7478.62	208.292	0.2412	0.8042	0.8042
3	E	G_C2_L4	5812.1	161.876	0.1875	0.625	0.625
3	E	G_C2_L2	9132.3	254.349	0.2946	0.982	0.982
3	E	G_C0_L3	5891.67	164.092	0.1901	0.6335	0.6335
3	E	G_C0_L1	4220.37	117.544	0.1361	0.4538	0.4538
3	E	D_L_BOT	7429.83	206.933	0.2397	0.7989	0.7989
3	E	L_B_2	8230.91	229.244	0.2655	0.885	0.885
3	E	L_B_1	7768.38	216.362	0.2506	0.8353	0.8353
4	E	G_C2_L0	1687.81	47.0083	0.0544	0.1815	0.1815
4	E	G_C2_L21	7841.84	218.408	0.253	0.8432	0.8432
4	E	G_C2_L1	5977.4	166.48	0.1928	0.6427	0.6427
4	E	G_C1_L4	4246.95	118.284	0.137	0.4567	0.4567
4	E	G_C0_L2	7708.44	214.692	0.2487	0.8289	0.8289
4	E	G_C1_L3	7460.61	207.79	0.2407	0.8022	0.8022
4	E	G_C0_L1	7757.67	216.064	0.2502	0.8342	0.8342
4	E	G_C2_L3	4700.72	130.923	0.1516	0.5055	0.5055
4	E	L_F_4	7004.74	195.093	0.226	0.7532	0.7532
4	E	L_B_4	9163.14	255.208	0.2956	0.9853	0.9853
4	E	L_B_3	4847.41	135.008	0.1564	0.5212	0.5212

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	_mm	N_m3	_m_m	or_D
5	E	G_C0_L21	2904.43	80.893	0.0937	0.3123	0.3123
5	E	G_C2_L21	7380.69	205.564	0.2381	0.7936	0.7936
5	E	G_C1_L4	4358.58	121.393	0.1406	0.4687	0.4687
5	E	G_C1_L3	7124.79	198.437	0.2298	0.7661	0.7661
5	E	G_C0_L4	6461.61	179.966	0.2084	0.6948	0.6948
5	E	G_C2_L4	9221.59	256.836	0.2975	0.9916	0.9916
5	E	G_C2_L0	1737.83	48.4013	0.0561	0.1869	0.1869
5	E	G_C0_L1	4106.35	114.369	0.1325	0.4415	0.4415
5	E	G_C1_L1	6059.78	168.775	0.1955	0.6516	0.6516
5	E	L_B_3	6958.31	193.8	0.2245	0.7482	0.7482
5	E	L_B_5	5517.22	153.664	0.178	0.5932	0.5932
6	E	G_C1_L0	5911.47	164.644	0.1907	0.6356	0.6356
6	E	G_C0_L21	8226.42	229.119	0.2654	0.8846	0.8846
6	E	G_C0_L0	7351.13	204.741	0.2371	0.7904	0.7904
6	E	G_C0_L1	4979.75	138.694	0.1606	0.5355	0.5355
6	E	G_C0_L2	8764.58	244.108	0.2827	0.9424	0.9424
6	E	G_C1_L3	7884.92	219.608	0.2544	0.8478	0.8478
6	E	G_C2_L0	4556.84	126.915	0.147	0.49	0.49
6	E	G_C1_L2	9209.36	256.495	0.2971	0.9903	0.9903
6	E	G_C1_L1	7077.34	197.115	0.2283	0.761	0.761
6	E	D_R_BOT	3749.2	104.421	0.1209	0.4031	0.4031
6	E	L_F_4	8211.55	228.705	0.2649	0.883	0.883
6	E	L_B_1	8230.83	229.242	0.2655	0.885	0.885
6	E	L_B_4	8821.86	245.703	0.2846	0.9486	0.9486
7	E	G_C2_L0	8966.02	249.718	0.2892	0.9641	0.9641
7	E	G_C1_L21	5839.11	162.629	0.1884	0.6279	0.6279
7	E	G_C2_L1	5575.69	155.292	0.1799	0.5995	0.5995
7	E	G_C2_L3	7077.12	197.109	0.2283	0.761	0.761
7	E	G_C0_L4	7739.4	215.555	0.2497	0.8322	0.8322
7	E	G_C1_L0	3222.53	89.7526	0.104	0.3465	0.3465
7	E	G_C2_L2	6839.32	190.486	0.2206	0.7354	0.7354
7	E	G_C0_L3	9044.81	251.912	0.2918	0.9726	0.9726
7	E	G_C2_L4	2352.24	65.5137	0.0759	0.2529	0.2529
7	E	G_C0_L2	4068.35	113.31	0.1312	0.4375	0.4375
7	E	L_B_2	7974.41	222.1	0.2572	0.8575	0.8575
8	E	G_C2_L21	8943.45	249.089	0.2885	0.9617	0.9617
8	E	G_C1_L21	4063.18	113.166	0.1311	0.4369	0.4369
8	E	G_C0_L21	5515.19	153.607	0.1779	0.593	0.593
8	E	G_C0_L4	8400.19	233.959	0.271	0.9032	0.9032
8	E	G_C0_L2	3063.89	85.3343	0.0988	0.3295	0.3295
8	E	G_C2_L3	8141.72	226.76	0.2626	0.8755	0.8755
8	E	G_C0_L3	8719.62	242.856	0.2813	0.9376	0.9376
8	E	G_C1_L3	8623.81	240.187	0.2782	0.9273	0.9273
8	E	G_C2_L0	7051.88	196.406	0.2275	0.7583	0.7583
8	E	L_B_1	7865.17	219.058	0.2537	0.8457	0.8457
8	E	L_F_3	4311	120.068	0.1391	0.4635	0.4635
9	E	G_C1_L21	7289.64	203.028	0.2351	0.7838	0.7838
9	E	G_C2_L21	7523.88	209.552	0.2427	0.809	0.809
9	E	G_C2_L0	2056.03	57.2637	0.0663	0.2211	0.2211
9	E	G_C2_L4	5381.02	149.87	0.1736	0.5786	0.5786
9	E	G_C2_L1	7585.4	211.266	0.2447	0.8156	0.8156
9	E	G_C2_L0	7946.37	221.319	0.2563	0.8544	0.8544
9	E	G_C2_L3	7626.44	212.409	0.246	0.82	0.82
9	E	G_C1_L3	7840.21	218.362	0.2529	0.843	0.843
9	E	G_C0_L4	6395.66	178.129	0.2063	0.6877	0.6877
9	E	D_R_BOT	8205.56	228.538	0.2647	0.8823	0.8823
9	E	L_B_2	7548.42	210.236	0.2435	0.8117	0.8117
9	E	L_F_1	5395.97	150.286	0.1741	0.5802	0.5802
9	E	L_B_5	7809.44	217.506	0.2519	0.8397	0.8397
10	E	G_C0_L21	4161.09	115.893	0.1342	0.4474	0.4474
10	E	G_C1_L21	2534.48	70.5894	0.0818	0.2725	0.2725
10	E	G_C2_L21	7069.32	196.892	0.228	0.7601	0.7601
10	E	G_C1_L0	1328.92	37.0127	0.0429	0.1429	0.1429
10	E	G_C1_L2	8517.28	237.22	0.2748	0.9158	0.9158
10	E	G_C1_L3	8056.58	224.389	0.2599	0.8663	0.8663
10	E	G_C1_L1	4790.94	133.435	0.1545	0.5152	0.5152
10	E	G_C2_L4	8474.65	236.033	0.2734	0.9113	0.9113
10	E	G_C2_L0	8726.52	243.048	0.2815	0.9383	0.9383

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
10	E	G_C0_L1	9067.44	252.543	0.2925	0.975	0.975
10	E	G_C0_L4	6962.88	193.928	0.2246	0.7487	0.7487
10	E	D_R_BOT	8914.88	248.294	0.2876	0.9586	0.9586
10	E	L_F_3	8688.27	241.982	0.2803	0.9342	0.9342
11	E	G_C1_L0	5278.59	147.017	0.1703	0.5676	0.5676
11	E	G_C0_L21	7157.36	199.344	0.2309	0.7696	0.7696
11	E	G_C0_L0	8986.64	250.292	0.2899	0.9663	0.9663
11	E	G_C1_L21	3712.73	103.406	0.1198	0.3992	0.3992
11	E	G_C0_L2	5244.43	146.066	0.1692	0.5639	0.5639
11	E	G_C0_L4	8558.78	238.376	0.2761	0.9203	0.9203
11	E	G_C1_L0	8035.66	223.806	0.2592	0.864	0.864
11	E	G_C0_L3	6942.18	193.351	0.2239	0.7465	0.7465
11	E	G_C1_L4	8595.06	239.386	0.2773	0.9242	0.9242
11	E	G_C2_L3	7697.89	214.399	0.2483	0.8277	0.8277
11	E	G_C2_L2	5167.79	143.931	0.1667	0.5557	0.5557
11	E	G_C2_L4	8993.45	250.482	0.2901	0.967	0.967
11	E	D_R_BOT	4685.25	130.492	0.1511	0.5038	0.5038
11	E	L_F_5	9247.67	257.563	0.2983	0.9944	0.9944
11	E	L_B_2	4065.91	113.242	0.1312	0.4372	0.4372
11	E	L_B_4	7830.75	218.099	0.2526	0.842	0.842
12	E	G_C1_L0	7240.66	201.664	0.2336	0.7786	0.7786
12	E	G_C0_L0	6357.96	177.079	0.2051	0.6837	0.6837
12	E	G_C2_L21	8561.45	238.45	0.2762	0.9206	0.9206
12	E	G_C0_L2	8317.48	231.655	0.2683	0.8944	0.8944
12	E	G_C2_L4	3120.65	86.9152	0.1007	0.3356	0.3356
12	E	G_C2_L3	3708.63	103.291	0.1196	0.3988	0.3988
12	E	G_C2_L0	8347.57	232.493	0.2693	0.8976	0.8976
12	E	G_C0_L0	8770.26	244.266	0.2829	0.943	0.943
12	E	G_C1_L3	8475.05	236.044	0.2734	0.9113	0.9113
12	E	L_B_2	7865.29	219.061	0.2537	0.8457	0.8457
12	E	L_B_4	6612.15	184.159	0.2133	0.711	0.711
13	E	G_C1_L21	8982.95	250.19	0.2898	0.9659	0.9659
13	E	G_C0_L0	7594.98	211.532	0.245	0.8167	0.8167
13	E	G_C0_L1	4224.57	117.661	0.1363	0.4543	0.4543
13	E	G_C1_L3	4673.56	130.166	0.1508	0.5025	0.5025
13	E	G_C0_L3	7181.79	200.024	0.2317	0.7722	0.7722
13	E	G_C1_L2	7157.71	199.354	0.2309	0.7696	0.7696
13	E	G_C2_L3	5631.25	156.839	0.1817	0.6055	0.6055
13	E	G_C1_L4	6357.46	177.065	0.2051	0.6836	0.6836
13	E	G_C0_L4	5062.42	140.996	0.1633	0.5443	0.5443
13	E	D_L_BOT	7232.93	201.449	0.2333	0.7777	0.7777
13	E	L_B_1	6436.57	179.269	0.2076	0.6921	0.6921
14	E	G_C0_L21	5514.79	153.596	0.1779	0.593	0.593
14	E	G_C1_L0	5752.35	160.212	0.1856	0.6185	0.6185
14	E	G_C2_L0	6740.57	187.736	0.2174	0.7248	0.7248
14	E	G_C2_L4	8027.61	223.582	0.259	0.8632	0.8632
14	E	G_C2_L1	9275.72	258.344	0.2992	0.9974	0.9974
14	E	G_C1_L0	4001.75	111.455	0.1291	0.4303	0.4303
14	E	G_C0_L3	9179.89	255.675	0.2961	0.9871	0.9871
14	E	G_C1_L4	5965.37	166.145	0.1924	0.6414	0.6414
14	E	G_C0_L0	8384.28	233.516	0.2705	0.9015	0.9015
14	E	L_B_4	6568.7	182.949	0.2119	0.7063	0.7063
15	E	G_C0_L21	2425.88	67.5647	0.0783	0.2608	0.2608
15	E	G_C2_L21	8955.71	249.431	0.2889	0.963	0.963
15	E	G_C0_L0	5665.66	157.798	0.1828	0.6092	0.6092
15	E	G_C0_L2	8904.71	248.011	0.2872	0.9575	0.9575
15	E	G_C2_L4	4998.51	139.216	0.1612	0.5375	0.5375
15	E	G_C2_L2	8800.26	245.101	0.2839	0.9463	0.9463
15	E	G_C1_L0	125.889	3.5062	0.0041	0.0135	0.0135
15	E	G_C2_L3	9027.3	251.425	0.2912	0.9707	0.9707
15	E	G_C1_L4	8291.56	230.933	0.2675	0.8916	0.8916
15	E	G_C1_L3	2566.72	71.4872	0.0828	0.276	0.276
15	E	G_C0_L0	5649.61	157.351	0.1822	0.6075	0.6075
15	E	G_C1_L1	8502.72	236.815	0.2743	0.9143	0.9143
15	E	L_B_2	2779.97	77.4266	0.0897	0.2989	0.2989
16	E	G_C0_L21	8411.91	234.285	0.2714	0.9045	0.9045
16	E	G_C1_L21	3519.21	98.0156	0.1135	0.3784	0.3784
16	E	G_C2_L0	5158.19	143.664	0.1664	0.5546	0.5546

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
16	E	G_C2_L0	5597.82	155.908	0.1806	0.6019	0.6019
16	E	G_C0_L4	8610.23	239.809	0.2777	0.9258	0.9258
16	E	G_C0_L3	8199.23	228.362	0.2645	0.8816	0.8816
16	E	G_C1_L2	8931.25	248.75	0.2881	0.9603	0.9603
16	E	G_C2_L4	3311.4	92.2279	0.1068	0.3561	0.3561
16	E	G_C1_L1	8710.02	242.588	0.281	0.9366	0.9366
16	E	G_C0_L0	6417.42	178.735	0.207	0.69	0.69
16	E	D_L_BOT	6852.93	190.865	0.2211	0.7369	0.7369
16	E	L_B_4	7940.93	221.168	0.2562	0.8539	0.8539
17	E	G_C2_L21	6868.66	191.303	0.2216	0.7386	0.7386
17	E	G_C0_L0	7251.47	201.965	0.2339	0.7797	0.7797
17	E	G_C2_L0	5520.83	153.764	0.1781	0.5936	0.5936
17	E	G_C1_L4	3108.02	86.5633	0.1003	0.3342	0.3342
17	E	G_C0_L2	7372.98	205.35	0.2378	0.7928	0.7928
17	E	G_C2_L3	4974.69	138.553	0.1605	0.5349	0.5349
17	E	G_C1_L0	6535.36	182.02	0.2108	0.7027	0.7027
17	E	G_C2_L1	9060.9	252.361	0.2923	0.9743	0.9743
17	E	G_C1_L2	8532.37	237.64	0.2752	0.9175	0.9175
17	E	G_C1_L1	6419.44	178.792	0.2071	0.6903	0.6903
17	E	G_C0_L4	5995.81	166.993	0.1934	0.6447	0.6447
17	E	G_C1_L3	7134.52	198.708	0.2301	0.7672	0.7672
17	E	D_L_BOT	4398.78	122.513	0.1419	0.473	0.473
17	E	L_F_2	7285.96	202.926	0.235	0.7834	0.7834
18	E	G_C0_L0	7062.79	196.71	0.2278	0.7594	0.7594
18	E	G_C1_L0	6853.75	190.888	0.2211	0.737	0.737
18	E	G_C1_L21	9114.62	253.857	0.294	0.9801	0.9801
18	E	G_C0_L2	2975.39	82.8695	0.096	0.3199	0.3199
18	E	G_C2_L4	9036.9	251.692	0.2915	0.9717	0.9717
18	E	G_C2_L1	7055.45	196.506	0.2276	0.7587	0.7587
18	E	G_C0_L0	7879.01	219.443	0.2542	0.8472	0.8472
18	E	G_C1_L3	6860.69	191.081	0.2213	0.7377	0.7377
18	E	G_C2_L2	6719.53	187.15	0.2168	0.7225	0.7225
18	E	G_C0_L3	7255.4	202.075	0.234	0.7802	0.7802
18	E	D_R_BOT	6676.52	185.952	0.2154	0.7179	0.7179
18	E	L_F_1	8746	243.59	0.2821	0.9404	0.9404
18	E	L_B_4	8841.57	246.252	0.2852	0.9507	0.9507
19	E	G_C1_L21	8451.78	235.396	0.2726	0.9088	0.9088
19	E	G_C1_L0	5382.84	149.921	0.1736	0.5788	0.5788
19	E	G_C2_L0	7827.31	218.003	0.2525	0.8416	0.8416
19	E	G_C2_L21	7926.36	220.762	0.2557	0.8523	0.8523
19	E	G_C2_L3	6345.24	176.725	0.2047	0.6823	0.6823
19	E	G_C1_L2	3709.27	103.309	0.1197	0.3988	0.3988
19	E	G_C0_L0	8535.05	237.715	0.2753	0.9177	0.9177
19	E	G_C2_L4	4988.23	138.93	0.1609	0.5364	0.5364
19	E	G_C0_L3	6028.46	167.902	0.1945	0.6482	0.6482
19	E	G_C1_L3	5052.6	140.723	0.163	0.5433	0.5433
19	E	D_L_BOT	7729.82	215.288	0.2493	0.8312	0.8312
19	E	L_B_1	7793.87	217.072	0.2514	0.8381	0.8381
20	E	G_C2_L21	7635.82	212.67	0.2463	0.8211	0.8211
20	E	G_C0_L21	4883.74	136.02	0.1575	0.5251	0.5251
20	E	G_C1_L0	6798.61	189.352	0.2193	0.731	0.731
20	E	G_C0_L0	4654.6	129.638	0.1501	0.5005	0.5005
20	E	G_C0_L4	5390.02	150.121	0.1739	0.5796	0.5796
20	E	G_C2_L1	4724.75	131.592	0.1524	0.508	0.508
20	E	G_C0_L2	2779.66	77.418	0.0897	0.2989	0.2989
20	E	G_C2_L3	6953.37	193.663	0.2243	0.7477	0.7477
20	E	G_C1_L1	8986.69	250.294	0.2899	0.9663	0.9663
20	E	G_C2_L4	6327.84	176.241	0.2041	0.6804	0.6804
20	E	G_C0_L3	8743.88	243.531	0.2821	0.9402	0.9402
20	E	G_C1_L4	5221.46	145.426	0.1684	0.5614	0.5614
20	E	G_C1_L2	7883.67	219.573	0.2543	0.8477	0.8477
20	E	D_R_BOT	8184.27	227.945	0.264	0.88	0.88
20	E	L_F_2	7719.64	215.004	0.249	0.8301	0.8301
20	E	L_B_1	2995.73	83.436	0.0966	0.3221	0.3221
20	E	L_B_5	7418.56	206.619	0.2393	0.7977	0.7977
21	E	G_C1_L21	6730.04	187.443	0.2171	0.7237	0.7237
21	E	G_C2_L0	6302.38	175.531	0.2033	0.6777	0.6777
21	E	G_C0_L0	6413.92	178.638	0.2069	0.6897	0.6897

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
21	E	G_C2_L2	8852.4	246.554	0.2856	0.9519	0.9519
21	E	G_C0_L4	1100.62	30.654	0.0355	0.1183	0.1183
21	E	G_C0_L3	7517.99	209.388	0.2425	0.8084	0.8084
21	E	G_C0_L2	9121.07	254.036	0.2942	0.9808	0.9808
21	E	G_C1_L3	6469.52	180.186	0.2087	0.6956	0.6956
21	E	G_C2_L0	8140.43	226.724	0.2626	0.8753	0.8753
21	E	G_C2_L4	5342.72	148.803	0.1723	0.5745	0.5745
21	E	L_F_1	5465.67	152.228	0.1763	0.5877	0.5877
21	E	L_B_5	8511.07	237.047	0.2746	0.9152	0.9152
22	E	G_C2_L21	9277.91	258.405	0.2993	0.9976	0.9976
22	E	G_C1_L21	7895.42	219.9	0.2547	0.849	0.849
22	E	G_C2_L2	6149.22	171.266	0.1984	0.6612	0.6612
22	E	G_C2_L1	4711.32	131.218	0.152	0.5066	0.5066
22	E	G_C2_L4	4580.94	127.587	0.1478	0.4926	0.4926
22	E	G_C0_L0	5507.24	153.386	0.1777	0.5922	0.5922
22	E	G_C1_L2	8414.96	234.37	0.2715	0.9048	0.9048
22	E	G_C0_L1	8726.33	243.042	0.2815	0.9383	0.9383
22	E	G_C1_L3	6384.94	177.831	0.206	0.6866	0.6866
22	E	G_C0_L2	8726.07	243.035	0.2815	0.9383	0.9383
22	E	G_C2_L3	8443.59	235.167	0.2724	0.9079	0.9079
22	E	D_R_BOT	8033.5	223.746	0.2591	0.8638	0.8638
22	E	L_F_3	5526.9	153.933	0.1783	0.5943	0.5943
22	E	L_B_3	8685.35	241.901	0.2802	0.9339	0.9339
22	E	L_F_2	2692.71	74.9964	0.0869	0.2895	0.2895
23	E	G_C2_L0	4239.7	118.082	0.1368	0.4559	0.4559
23	E	G_C2_L21	3715.14	103.473	0.1198	0.3995	0.3995
23	E	G_C1_L21	8348.07	232.507	0.2693	0.8976	0.8976
23	E	G_C0_L4	7379.9	205.542	0.2381	0.7935	0.7935
23	E	G_C1_L0	7181.69	200.022	0.2317	0.7722	0.7722
23	E	G_C2_L1	7629.29	212.488	0.2461	0.8204	0.8204
23	E	G_C0_L0	8090.93	225.345	0.261	0.87	0.87
23	E	G_C1_L4	7292.63	203.112	0.2352	0.7842	0.7842
23	E	G_C0_L3	7976.87	222.169	0.2573	0.8577	0.8577
23	E	G_C1_L1	9026.83	251.412	0.2912	0.9706	0.9706
23	E	D_L_BOT	6637.01	184.852	0.2141	0.7137	0.7137
23	E	L_F_2	6184.97	172.261	0.1995	0.6651	0.6651
23	E	L_B_1	4437.13	123.581	0.1431	0.4771	0.4771
24	E	G_C2_L0	7908.61	220.268	0.2551	0.8504	0.8504
24	E	G_C0_L0	2709.7	75.4694	0.0874	0.2914	0.2914
24	E	G_C1_L0	7662.22	213.405	0.2472	0.8239	0.8239
24	E	G_C1_L21	8280.99	230.639	0.2671	0.8904	0.8904
24	E	G_C2_L3	2126.9	59.2376	0.0686	0.2287	0.2287
24	E	G_C2_L4	4685.68	130.504	0.1512	0.5038	0.5038
24	E	G_C1_L0	8296.22	231.063	0.2676	0.8921	0.8921
24	E	G_C2_L0	8282.95	230.694	0.2672	0.8906	0.8906
24	E	G_C1_L1	8894.41	247.724	0.2869	0.9564	0.9564
24	E	G_C0_L0	3816.24	106.288	0.1231	0.4103	0.4103
24	E	L_F_2	8230.69	229.238	0.2655	0.885	0.885
24	E	L_F_5	7914.74	220.438	0.2553	0.851	0.851
25	E	G_C0_L0	6434.72	179.217	0.2076	0.6919	0.6919
25	E	G_C2_L21	8140.66	226.731	0.2626	0.8753	0.8753
25	E	G_C0_L21	8934.97	248.853	0.2882	0.9607	0.9607
25	E	G_C1_L21	2941.59	81.9279	0.0949	0.3163	0.3163
25	E	G_C0_L2	6562.13	182.766	0.2117	0.7056	0.7056
25	E	G_C1_L4	4753.64	132.396	0.1533	0.5111	0.5111
25	E	G_C0_L1	8120.02	226.155	0.2619	0.8731	0.8731
25	E	G_C1_L2	7395.69	205.982	0.2386	0.7952	0.7952
25	E	G_C2_L0	7780.58	216.702	0.251	0.8366	0.8366
25	E	G_C0_L4	6099.98	169.894	0.1968	0.6559	0.6559
25	E	G_C2_L1	2940.41	81.895	0.0949	0.3162	0.3162
25	E	G_C1_L1	7072.46	196.98	0.2281	0.7605	0.7605
25	E	G_C2_L2	9130.57	254.301	0.2945	0.9818	0.9818
25	E	D_L_BOT	8799.05	245.068	0.2838	0.9461	0.9461
25	E	L_F_3	7868.85	219.16	0.2538	0.8461	0.8461
26	E	G_C1_L21	8293.8	230.996	0.2675	0.8918	0.8918
26	E	G_C0_L21	9046.19	251.951	0.2918	0.9727	0.9727
26	E	G_C1_L0	6055.48	168.655	0.1953	0.6511	0.6511
26	E	G_C2_L0	7984.32	222.376	0.2576	0.8585	0.8585

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
26	E	G_C2_L3	7048.39	196.309	0.2274	0.7579	0.7579
26	E	G_C1_L3	2432.97	67.7623	0.0785	0.2616	0.2616
26	E	G_C0_L4	7643.99	212.898	0.2466	0.8219	0.8219
26	E	G_C1_L1	7152.78	199.216	0.2307	0.7691	0.7691
26	E	G_C1_L2	4843.25	134.892	0.1562	0.5208	0.5208
26	E	G_C0_L3	5184.68	144.402	0.1672	0.5575	0.5575
26	E	G_C2_L1	8888.84	247.568	0.2867	0.9558	0.9558
26	E	D_L_BOT	9011.55	250.986	0.2907	0.969	0.969
26	E	L_F_3	3689.29	102.753	0.119	0.3967	0.3967
26	E	L_F_1	5259.31	146.48	0.1697	0.5655	0.5655
26	E	L_B_3	4085.25	113.781	0.1318	0.4393	0.4393
27	E	G_C1_L21	6882.62	191.692	0.222	0.7401	0.7401
27	E	G_C1_L0	2564.74	71.432	0.0827	0.2758	0.2758
27	E	G_C2_L3	8845.94	246.374	0.2854	0.9512	0.9512
27	E	G_C0_L0	3496.64	97.387	0.1128	0.376	0.376
27	E	G_C1_L3	6585.35	183.412	0.2124	0.7081	0.7081
27	E	G_C1_L2	7093.48	197.565	0.2288	0.7627	0.7627
27	E	G_C0_L4	8729.81	243.139	0.2816	0.9387	0.9387
27	E	G_C0_L1	5185.56	144.426	0.1673	0.5576	0.5576
27	E	G_C1_L0	6478.22	180.429	0.209	0.6966	0.6966
27	E	G_C1_L4	5662.77	157.717	0.1827	0.6089	0.6089
27	E	D_R_BOT	5271.25	146.813	0.17	0.5668	0.5668
27	E	L_F_3	6806.41	189.569	0.2196	0.7319	0.7319
28	E	G_C0_L0	3807.51	106.045	0.1228	0.4094	0.4094
28	E	G_C2_L0	5211.59	145.151	0.1681	0.5604	0.5604
28	E	G_C0_L21	8164.96	227.407	0.2634	0.878	0.878
28	E	G_C1_L0	3549.75	98.8662	0.1145	0.3817	0.3817
28	E	G_C2_L3	6065.63	168.938	0.1957	0.6522	0.6522
28	E	G_C0_L3	6814.25	189.788	0.2198	0.7327	0.7327
28	E	G_C1_L1	5580.81	155.434	0.18	0.6001	0.6001
28	E	G_C0_L0	6468.17	180.149	0.2087	0.6955	0.6955
28	E	G_C2_L4	7553.82	210.386	0.2437	0.8122	0.8122
28	E	G_C2_L1	4910.74	136.772	0.1584	0.528	0.528
28	E	G_C0_L1	7108.18	197.974	0.2293	0.7643	0.7643
28	E	L_F_5	6700	186.606	0.2161	0.7204	0.7204
28	E	L_B_5	9040.82	251.802	0.2916	0.9721	0.9721
29	E	G_C0_L21	8744.38	243.545	0.2821	0.9403	0.9403
29	E	G_C2_L21	8628.01	240.304	0.2783	0.9277	0.9277
29	E	G_C2_L0	6429.63	179.076	0.2074	0.6914	0.6914
29	E	G_C1_L1	5959.46	165.981	0.1922	0.6408	0.6408
29	E	G_C1_L0	8104.1	225.712	0.2614	0.8714	0.8714
29	E	G_C2_L4	7568.43	210.793	0.2441	0.8138	0.8138
29	E	G_C1_L2	8232.92	229.3	0.2656	0.8853	0.8853
29	E	L_F_4	8699.1	242.284	0.2806	0.9354	0.9354
30	E	G_C1_L0	3608.68	100.508	0.1164	0.388	0.388
30	E	G_C2_L21	9078.55	252.852	0.2929	0.9762	0.9762
30	E	G_C1_L21	7819.38	217.782	0.2522	0.8408	0.8408
30	E	G_C0_L0	7668.02	213.567	0.2474	0.8245	0.8245
30	E	G_C0_L4	7917.42	220.513	0.2554	0.8513	0.8513
30	E	G_C0_L2	9077.05	252.811	0.2928	0.976	0.976
30	E	G_C0_L0	7840.71	218.376	0.2529	0.8431	0.8431
30	E	G_C2_L3	8914.78	248.291	0.2876	0.9586	0.9586
30	E	G_C2_L1	6246.85	173.985	0.2015	0.6717	0.6717
30	E	G_C1_L0	7359.33	204.969	0.2374	0.7913	0.7913
30	E	D_L_BOT	6580.51	183.278	0.2123	0.7076	0.7076
30	E	L_F_3	6268.96	174.601	0.2022	0.6741	0.6741
31	E	G_C0_L21	6261.23	174.385	0.202	0.6733	0.6733
31	E	G_C2_L0	7374.88	205.402	0.2379	0.793	0.793
31	E	G_C1_L1	6278.38	174.863	0.2025	0.6751	0.6751
31	E	G_C0_L2	6128.16	170.679	0.1977	0.6589	0.6589
31	E	G_C0_L1	9219.03	256.765	0.2974	0.9913	0.9913
31	E	G_C2_L0	7596.73	211.581	0.2451	0.8169	0.8169
31	E	G_C0_L4	7442.49	207.285	0.2401	0.8003	0.8003
31	E	G_C2_L3	8190.46	228.118	0.2642	0.8807	0.8807
31	E	G_C1_L3	6730.23	187.448	0.2171	0.7237	0.7237
31	E	G_C2_L2	8614.15	239.918	0.2779	0.9263	0.9263
31	E	G_C1_L0	7335.02	204.292	0.2366	0.7887	0.7887
31	E	L_B_1	7646.13	212.957	0.2466	0.8222	0.8222

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
32	E	G_C0_L0	4572.86	127.362	0.1475	0.4917	0.4917
32	E	G_C2_L0	8160.26	227.276	0.2632	0.8774	0.8774
32	E	G_C1_L21	5961.88	166.048	0.1923	0.6411	0.6411
32	E	G_C0_L3	6654.89	185.349	0.2147	0.7156	0.7156
32	E	G_C0_L1	4835.13	134.666	0.156	0.5199	0.5199
32	E	G_C0_L4	8579.45	238.952	0.2768	0.9225	0.9225
32	E	G_C1_L3	8611.98	239.858	0.2778	0.926	0.926
32	E	G_C2_L3	4780.26	133.138	0.1542	0.514	0.514
32	E	G_C0_L2	6631.89	184.709	0.2139	0.7131	0.7131
32	E	L_F_3	9110.58	253.744	0.2939	0.9796	0.9796
33	E	G_C0_L21	7379.62	205.534	0.2381	0.7935	0.7935
33	E	G_C2_L0	2728.42	75.9909	0.088	0.2934	0.2934
33	E	G_C2_L21	8171.2	227.581	0.2636	0.8786	0.8786
33	E	G_C1_L21	5566.23	155.028	0.1796	0.5985	0.5985
33	E	G_C1_L3	5343.59	148.828	0.1724	0.5746	0.5746
33	E	G_C0_L1	8073.06	224.848	0.2604	0.8681	0.8681
33	E	G_C2_L0	8544.97	237.991	0.2756	0.9188	0.9188
33	E	G_C2_L1	2165.07	60.3007	0.0698	0.2328	0.2328
33	E	G_C1_L4	4536.21	126.341	0.1463	0.4878	0.4878
33	E	G_C0_L0	8369.74	233.111	0.27	0.9	0.9
33	E	G_C1_L0	5254.66	146.351	0.1695	0.565	0.565
33	E	G_C0_L4	7348.13	204.657	0.237	0.7901	0.7901
33	E	G_C0_L3	6446.68	179.55	0.208	0.6932	0.6932
33	E	L_F_5	9003.44	250.76	0.2904	0.9681	0.9681
33	E	L_F_4	4386.72	122.177	0.1415	0.4717	0.4717
33	E	L_B_2	5578.41	155.368	0.1799	0.5998	0.5998
34	E	G_C1_L0	9284.41	258.586	0.2995	0.9983	0.9983
34	E	G_C0_L0	8908	248.102	0.2874	0.9578	0.9578
34	E	G_C1_L21	7306.01	203.484	0.2357	0.7856	0.7856
34	E	G_C0_L4	3022.12	84.171	0.0975	0.325	0.325
34	E	G_C2_L2	4768.89	132.821	0.1538	0.5128	0.5128
34	E	G_C0_L3	4714.99	131.32	0.1521	0.507	0.507
34	E	G_C1_L4	4959.92	138.142	0.16	0.5333	0.5333
34	E	G_C2_L0	1978.78	55.1121	0.0638	0.2128	0.2128
34	E	G_C2_L1	2809.41	78.2467	0.0906	0.3021	0.3021
34	E	L_F_2	7677.98	213.844	0.2477	0.8256	0.8256
34	E	L_B_4	4554.19	126.841	0.1469	0.4897	0.4897
35	E	G_C1_L0	5721.57	159.355	0.1846	0.6152	0.6152
35	E	G_C1_L21	4961.97	138.199	0.1601	0.5335	0.5335
35	E	G_C2_L21	8632.95	240.442	0.2785	0.9283	0.9283
35	E	G_C0_L0	7576.67	211.023	0.2444	0.8147	0.8147
35	E	G_C0_L2	8984.88	250.243	0.2898	0.9661	0.9661
35	E	G_C0_L1	7231.79	201.417	0.2333	0.7776	0.7776
35	E	G_C1_L3	6219.75	173.23	0.2006	0.6688	0.6688
35	E	G_C2_L0	7842.76	218.434	0.253	0.8433	0.8433
35	E	G_C2_L4	4882.91	135.997	0.1575	0.525	0.525
35	E	G_C1_L0	6648.34	185.167	0.2145	0.7149	0.7149
35	E	G_C2_L1	7071.95	196.965	0.2281	0.7604	0.7604
35	E	G_C0_L3	6461.79	179.971	0.2084	0.6948	0.6948
35	E	G_C2_L2	7527.44	209.651	0.2428	0.8094	0.8094
35	E	L_F_1	4908.59	136.712	0.1583	0.5278	0.5278
35	E	L_F_5	5435.72	151.393	0.1753	0.5845	0.5845
36	E	G_C1_L21	8575.11	238.831	0.2766	0.9221	0.9221
36	E	G_C2_L0	7046.49	196.256	0.2273	0.7577	0.7577
36	E	G_C0_L21	3238.41	90.1949	0.1045	0.3482	0.3482
36	E	G_C1_L0	8397.3	233.878	0.2709	0.9029	0.9029
36	E	G_C0_L4	7358.28	204.94	0.2374	0.7912	0.7912
36	E	G_C1_L1	8027.18	223.57	0.2589	0.8631	0.8631
36	E	G_C1_L2	8048.31	224.159	0.2596	0.8654	0.8654
36	E	G_C0_L1	9224.11	256.906	0.2976	0.9918	0.9918
36	E	G_C1_L3	7971.81	222.028	0.2572	0.8572	0.8572
36	E	G_C2_L2	2606.92	72.607	0.0841	0.2803	0.2803
36	E	G_C2_L4	7292.95	203.12	0.2353	0.7842	0.7842
36	E	G_C2_L0	6222.3	173.301	0.2007	0.6691	0.6691
36	E	D_L_BOT	7170.4	199.707	0.2313	0.771	0.771
36	E	L_B_3	7161.65	199.464	0.231	0.7701	0.7701
37	E	G_C1_L0	6787.57	189.045	0.219	0.7298	0.7298
37	E	G_C0_L0	4604.38	128.239	0.1485	0.4951	0.4951

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
37	E	G_C2_L0	5756.28	160.322	0.1857	0.619	0.619
37	E	G_C1_L21	8947.11	249.192	0.2886	0.9621	0.9621
37	E	G_C1_L3	7411.96	206.435	0.2391	0.797	0.797
37	E	G_C0_L2	6809.15	189.646	0.2197	0.7322	0.7322
37	E	G_C2_L3	7110.79	198.047	0.2294	0.7646	0.7646
37	E	G_C1_L4	4404.97	122.686	0.1421	0.4737	0.4737
37	E	G_C0_L1	8078.82	225.008	0.2606	0.8687	0.8687
37	E	G_C1_L2	7152.92	199.22	0.2307	0.7691	0.7691
37	E	G_C1_L1	8526.61	237.48	0.2751	0.9168	0.9168
37	E	D_L_BOT	8130.73	226.454	0.2623	0.8743	0.8743
37	E	L_F_4	6351.97	176.913	0.2049	0.683	0.683
38	E	G_C0_L0	7818.71	217.764	0.2522	0.8407	0.8407
38	E	G_C2_L21	2459.5	68.5011	0.0793	0.2645	0.2645
38	E	G_C0_L21	8020.22	223.376	0.2587	0.8624	0.8624
38	E	G_C1_L3	4961.39	138.183	0.16	0.5335	0.5335
38	E	G_C0_L1	7895.88	219.913	0.2547	0.849	0.849
38	E	G_C0_L2	3574.31	99.5502	0.1153	0.3843	0.3843
38	E	G_C2_L3	4010.36	111.695	0.1294	0.4312	0.4312
38	E	G_C1_L2	8932.93	248.796	0.2882	0.9605	0.9605
38	E	G_C0_L4	4705.97	131.069	0.1518	0.506	0.506
38	E	L_B_2	4117.51	114.679	0.1328	0.4427	0.4427
39	E	G_C0_L0	8265.06	230.195	0.2666	0.8887	0.8887
39	E	G_C2_L0	8550.44	238.143	0.2758	0.9194	0.9194
39	E	G_C2_L21	7024.4	195.641	0.2266	0.7553	0.7553
39	E	G_C2_L4	8265.69	230.213	0.2666	0.8888	0.8888
39	E	G_C1_L0	6613.8	184.205	0.2133	0.7112	0.7112
39	E	G_C1_L1	7395.29	205.971	0.2386	0.7952	0.7952
39	E	G_C0_L0	5558.68	154.818	0.1793	0.5977	0.5977
39	E	G_C2_L3	8733.72	243.248	0.2817	0.9391	0.9391
39	E	L_F_3	5817.26	162.02	0.1877	0.6255	0.6255
39	E	L_B_4	1578.55	43.9651	0.0509	0.1697	0.1697
40	E	G_C2_L0	7838.95	218.327	0.2529	0.8429	0.8429
40	E	G_C1_L21	6204.56	172.807	0.2001	0.6672	0.6672
40	E	G_C0_L0	2680.75	74.6631	0.0865	0.2883	0.2883
40	E	G_C0_L21	6414.93	178.666	0.2069	0.6898	0.6898
40	E	G_C1_L0	5198.96	144.799	0.1677	0.559	0.559
40	E	G_C2_L4	7330.42	204.164	0.2365	0.7882	0.7882
40	E	G_C0_L4	7056.98	196.548	0.2276	0.7588	0.7588
40	E	G_C0_L1	4674.97	130.205	0.1508	0.5027	0.5027
40	E	G_C1_L4	7604.61	211.801	0.2453	0.8177	0.8177
40	E	D_R_BOT	7810.53	217.536	0.252	0.8398	0.8398
40	E	L_F_1	8584.19	239.084	0.2769	0.923	0.923
41	E	G_C2_L21	6760.16	188.281	0.2181	0.7269	0.7269
41	E	G_C1_L21	8224.92	229.077	0.2653	0.8844	0.8844
41	E	G_C0_L0	4786.86	133.322	0.1544	0.5147	0.5147
41	E	G_C2_L0	9046.08	251.948	0.2918	0.9727	0.9727
41	E	G_C0_L0	9286.27	258.638	0.2996	0.9985	0.9985
41	E	G_C0_L2	6783.06	188.919	0.2188	0.7294	0.7294
41	E	G_C0_L3	9128.39	254.24	0.2945	0.9815	0.9815
41	E	G_C1_L0	8656.48	241.097	0.2792	0.9308	0.9308
41	E	G_C0_L4	6062.96	168.863	0.1956	0.6519	0.6519
41	E	G_C0_L1	6252.06	174.13	0.2017	0.6723	0.6723
41	E	G_C1_L4	9262.42	257.973	0.2988	0.996	0.996
41	E	D_L_BOT	2343.39	65.2673	0.0756	0.252	0.252
41	E	L_F_4	8195.43	228.256	0.2644	0.8812	0.8812
42	E	G_C0_L0	7555.93	210.445	0.2437	0.8125	0.8125
42	E	G_C2_L21	5462.9	152.151	0.1762	0.5874	0.5874
42	E	G_C2_L0	7387.69	205.759	0.2383	0.7944	0.7944
42	E	G_C1_L2	4240.4	118.102	0.1368	0.456	0.456
42	E	G_C0_L2	9234.33	257.191	0.2979	0.9929	0.9929
42	E	G_C1_L1	9081.05	252.922	0.2929	0.9765	0.9765
42	E	G_C2_L3	7106.55	197.929	0.2292	0.7641	0.7641
42	E	G_C0_L3	7037.97	196.019	0.227	0.7568	0.7568
42	E	G_C1_L4	4081.9	113.688	0.1317	0.4389	0.4389
42	E	G_C0_L0	8746.21	243.596	0.2821	0.9405	0.9405
42	E	G_C2_L4	4689.11	130.599	0.1513	0.5042	0.5042
42	E	G_C2_L0	2970.79	82.7414	0.0958	0.3194	0.3194
42	E	D_R_BOT	5662.45	157.708	0.1827	0.6089	0.6089

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
42	E	L_B_5	7746.28	215.746	0.2499	0.8329	0.8329
43	E	G_C1_L0	9018.33	251.175	0.2909	0.9697	0.9697
43	E	G_C2_L21	7762.81	216.207	0.2504	0.8347	0.8347
43	E	G_C2_L0	7049.33	196.335	0.2274	0.758	0.758
43	E	G_C2_L4	3952.62	110.087	0.1275	0.425	0.425
43	E	G_C2_L3	3046.67	84.8547	0.0983	0.3276	0.3276
43	E	G_C2_L0	6236.05	173.684	0.2012	0.6705	0.6705
43	E	G_C1_L0	5056.42	140.829	0.1631	0.5437	0.5437
43	E	G_C1_L1	6825.22	190.093	0.2202	0.7339	0.7339
43	E	G_C0_L1	8224.31	229.06	0.2653	0.8843	0.8843
43	E	G_C0_L2	6705.11	186.748	0.2163	0.721	0.721
43	E	G_C0_L3	6238.99	173.766	0.2013	0.6709	0.6709
43	E	G_C1_L4	7530.67	209.741	0.2429	0.8097	0.8097
43	E	D_R_BOT	6650.34	185.223	0.2145	0.7151	0.7151
43	E	L_F_4	4611.76	128.445	0.1488	0.4959	0.4959
43	E	L_B_1	2769.67	77.1398	0.0893	0.2978	0.2978
43	E	L_F_3	6543.07	182.235	0.2111	0.7036	0.7036
44	E	G_C1_L0	7253.45	202.02	0.234	0.7799	0.7799
44	E	G_C0_L0	5360.22	149.291	0.1729	0.5764	0.5764
44	E	G_C1_L4	6371.97	177.47	0.2055	0.6852	0.6852
44	E	G_C0_L4	5938.92	165.409	0.1916	0.6386	0.6386
44	E	G_C2_L4	8555.24	238.277	0.276	0.9199	0.9199
44	E	G_C2_L1	8777.52	244.468	0.2831	0.9438	0.9438
44	E	G_C0_L3	7566.28	210.733	0.2441	0.8136	0.8136
44	E	G_C1_L3	7373.32	205.359	0.2378	0.7928	0.7928
44	E	G_C1_L1	8450.85	235.37	0.2726	0.9087	0.9087
44	E	G_C2_L0	7345.61	204.587	0.237	0.7899	0.7899
44	E	D_L_BOT	8037.89	223.868	0.2593	0.8643	0.8643
44	E	L_B_1	7035.16	195.94	0.2269	0.7565	0.7565
44	E	L_F_4	3414.99	95.113	0.1102	0.3672	0.3672
45	E	G_C2_L21	8256.56	229.958	0.2663	0.8878	0.8878
45	E	G_C2_L0	6879.81	191.614	0.2219	0.7398	0.7398
45	E	G_C0_L21	9195.45	256.108	0.2966	0.9888	0.9888
45	E	G_C1_L4	8895.25	247.747	0.2869	0.9565	0.9565
45	E	G_C1_L0	6612.6	184.172	0.2133	0.711	0.711
45	E	G_C0_L0	7945.31	221.29	0.2563	0.8543	0.8543
45	E	G_C2_L0	6638.49	184.893	0.2141	0.7138	0.7138
45	E	G_C0_L2	7867.97	219.136	0.2538	0.846	0.846
45	E	G_C0_L4	7726.13	215.185	0.2492	0.8308	0.8308
45	E	G_C0_L3	7035.6	195.953	0.227	0.7565	0.7565
45	E	G_C2_L2	8549.95	238.13	0.2758	0.9193	0.9193
45	E	G_C1_L1	4932.52	137.379	0.1591	0.5304	0.5304
45	E	D_L_BOT	1782.93	49.6574	0.0575	0.1917	0.1917
45	E	L_F_3	6618.79	184.344	0.2135	0.7117	0.7117
45	E	L_F_5	8351.93	232.615	0.2694	0.8981	0.8981
45	E	L_B_5	8480.56	236.197	0.2736	0.9119	0.9119
46	E	G_C2_L21	7035.41	195.947	0.2269	0.7565	0.7565
46	E	G_C0_L0	6901.59	192.22	0.2226	0.7421	0.7421
46	E	G_C0_L21	8313.52	231.545	0.2682	0.8939	0.8939
46	E	G_C2_L2	6188.91	172.371	0.1996	0.6655	0.6655
46	E	G_C1_L0	8108.91	225.846	0.2616	0.8719	0.8719
46	E	G_C0_L0	6068.32	169.012	0.1958	0.6525	0.6525
46	E	G_C2_L1	4142.16	115.366	0.1336	0.4454	0.4454
46	E	G_C1_L1	4322.51	120.389	0.1394	0.4648	0.4648
46	E	G_C0_L3	8479.81	236.177	0.2735	0.9118	0.9118
46	E	G_C1_L3	8589.88	239.242	0.2771	0.9236	0.9236
46	E	G_C1_L2	7388.34	205.777	0.2383	0.7944	0.7944
46	E	L_F_5	5692.75	158.552	0.1836	0.6121	0.6121
46	E	L_B_1	6909.94	192.453	0.2229	0.743	0.743
46	E	L_F_4	8172.35	227.613	0.2636	0.8787	0.8787
47	E	G_C1_L0	1669.09	46.4868	0.0538	0.1795	0.1795
47	E	G_C0_L21	4114.6	114.598	0.1327	0.4424	0.4424
47	E	G_C2_L21	7113.86	198.133	0.2295	0.7649	0.7649
47	E	G_C1_L0	5311.67	147.939	0.1713	0.5711	0.5711
47	E	G_C0_L4	8764.26	244.099	0.2827	0.9424	0.9424
47	E	G_C2_L0	4716.86	131.372	0.1522	0.5072	0.5072
47	E	G_C2_L2	8037.97	223.87	0.2593	0.8643	0.8643
47	E	G_C1_L1	6960.97	193.874	0.2245	0.7485	0.7485

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
47	E	G_C2_L4	8310.43	231.459	0.2681	0.8936	0.8936
47	E	D_R_BOT	6482.65	180.552	0.2091	0.6971	0.6971
47	E	L_F_4	6481.39	180.517	0.2091	0.6969	0.6969
47	E	L_F_5	3536.96	98.5102	0.1141	0.3803	0.3803
47	E	L_B_5	2785.6	77.5833	0.0899	0.2995	0.2995
48	E	G_C2_L21	4959.09	138.119	0.16	0.5332	0.5332
48	E	G_C0_L0	8255.16	229.919	0.2663	0.8877	0.8877
48	E	G_C2_L0	7778.53	216.644	0.2509	0.8364	0.8364
48	E	G_C0_L3	7156.57	199.322	0.2309	0.7695	0.7695
48	E	G_C2_L4	6829.37	190.209	0.2203	0.7343	0.7343
48	E	G_C0_L0	6023.78	167.772	0.1943	0.6477	0.6477
48	E	G_C0_L4	5382.71	149.917	0.1736	0.5788	0.5788
48	E	G_C1_L2	6207.17	172.88	0.2002	0.6674	0.6674
48	E	L_F_4	2898.23	80.7203	0.0935	0.3116	0.3116
49	E	G_C0_L0	6224.8	173.371	0.2008	0.6693	0.6693
49	E	G_C1_L0	6244.62	173.923	0.2014	0.6715	0.6715
49	E	G_C2_L0	8907.94	248.1	0.2874	0.9578	0.9578
49	E	G_C0_L21	5707.44	158.962	0.1841	0.6137	0.6137
49	E	G_C2_L2	7898.33	219.981	0.2548	0.8493	0.8493
49	E	G_C0_L0	4485.59	124.931	0.1447	0.4823	0.4823
49	E	G_C1_L3	869.449	24.2156	0.028	0.0935	0.0935
49	E	G_C1_L1	7204.74	200.664	0.2324	0.7747	0.7747
49	E	G_C1_L4	8211.62	228.707	0.2649	0.883	0.883
49	E	G_C2_L4	5690.76	158.497	0.1836	0.6119	0.6119
49	E	G_C0_L3	6583.91	183.373	0.2124	0.7079	0.7079
49	E	G_C0_L4	6932.81	193.09	0.2236	0.7455	0.7455
49	E	G_C1_L2	9130.25	254.292	0.2945	0.9817	0.9817
49	E	D_L_BOT	2806.55	78.167	0.0905	0.3018	0.3018
49	E	L_B_1	5478.81	152.594	0.1767	0.5891	0.5891
49	E	L_F_5	6585.18	183.408	0.2124	0.7081	0.7081
49	E	L_F_3	5110	142.322	0.1648	0.5495	0.5495
50	E	G_C0_L21	1422.96	39.6316	0.0459	0.153	0.153
50	E	G_C1_L0	4682.75	130.422	0.1511	0.5035	0.5035
50	E	G_C2_L21	6864.22	191.179	0.2214	0.7381	0.7381
50	E	G_C1_L4	2728.25	75.9861	0.088	0.2934	0.2934
50	E	G_C2_L3	7617.52	212.16	0.2457	0.8191	0.8191
50	E	G_C0_L0	5093.37	141.859	0.1643	0.5477	0.5477
50	E	G_C0_L1	5421.25	150.99	0.1749	0.5829	0.5829
50	E	G_C0_L2	8583.68	239.069	0.2769	0.923	0.923
50	E	G_C2_L0	6867.9	191.282	0.2215	0.7385	0.7385
50	E	G_C1_L2	7535.16	209.867	0.2431	0.8102	0.8102
50	E	G_C0_L4	3889.96	108.342	0.1255	0.4183	0.4183
50	E	D_L_BOT	6069.74	169.052	0.1958	0.6527	0.6527
50	E	L_B_3	8428.52	234.748	0.2719	0.9063	0.9063
50	E	L_B_5	7362.11	205.047	0.2375	0.7916	0.7916
50	E	L_B_1	7476.97	208.246	0.2412	0.804	0.804
51	E	G_C2_L0	7026.55	195.701	0.2267	0.7555	0.7555
51	E	G_C0_L0	4271.93	118.98	0.1378	0.4593	0.4593
51	E	G_C0_L4	1512.63	42.1291	0.0488	0.1626	0.1626
51	E	G_C1_L3	4611.45	128.436	0.1488	0.4959	0.4959
51	E	G_C1_L0	6301.7	175.513	0.2033	0.6776	0.6776
51	E	G_C2_L1	7262.13	202.262	0.2343	0.7809	0.7809
51	E	G_C2_L3	7735.03	215.433	0.2495	0.8317	0.8317
51	E	G_C1_L1	7477.45	208.259	0.2412	0.804	0.804
51	E	G_C0_L3	4944.48	137.712	0.1595	0.5317	0.5317
51	E	L_B_5	7164.7	199.548	0.2311	0.7704	0.7704
51	E	L_B_1	8248.39	229.731	0.2661	0.8869	0.8869
52	E	G_C1_L0	8175.81	227.709	0.2637	0.8791	0.8791
52	E	G_C0_L0	6770.68	188.574	0.2184	0.728	0.728
52	E	G_C1_L21	6757.9	188.219	0.218	0.7267	0.7267
52	E	G_C0_L21	7075.49	197.064	0.2282	0.7608	0.7608
52	E	G_C2_L1	3318.78	92.4335	0.1071	0.3569	0.3569
52	E	G_C1_L1	6890.31	191.906	0.2223	0.7409	0.7409
52	E	G_C2_L2	2502.65	69.7027	0.0807	0.2691	0.2691
52	E	G_C2_L0	5678.02	158.142	0.1832	0.6105	0.6105
52	E	G_C1_L3	6245.74	173.954	0.2015	0.6716	0.6716
52	E	G_C0_L3	2060.86	57.3983	0.0665	0.2216	0.2216
52	E	G_C1_L2	8479.66	236.172	0.2735	0.9118	0.9118

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
52	E	G_C0_L1	5798.84	161.507	0.1871	0.6235	0.6235
52	E	G_C0_L0	8560.97	238.437	0.2762	0.9205	0.9205
52	E	L_B_2	7874.39	219.315	0.254	0.8467	0.8467
52	E	L_F_1	8433.45	234.885	0.272	0.9068	0.9068
53	E	G_C1_L21	8012.02	223.148	0.2585	0.8615	0.8615
53	E	G_C1_L0	2974.74	82.8513	0.096	0.3199	0.3199
53	E	G_C2_L21	6728.04	187.387	0.217	0.7234	0.7234
53	E	G_C0_L0	4919.85	137.026	0.1587	0.529	0.529
53	E	G_C2_L2	3995	111.267	0.1289	0.4296	0.4296
53	E	G_C1_L0	7972.69	222.052	0.2572	0.8573	0.8573
53	E	G_C1_L3	7435.88	207.101	0.2399	0.7996	0.7996
53	E	G_C2_L1	7505.68	209.045	0.2421	0.8071	0.8071
53	E	G_C1_L2	7279.53	202.747	0.2348	0.7827	0.7827
53	E	L_F_2	5228.71	145.628	0.1687	0.5622	0.5622
53	E	L_F_3	8381.54	233.439	0.2704	0.9012	0.9012
53	E	L_F_4	5812.23	161.88	0.1875	0.625	0.625
54	E	G_C0_L0	5497.36	153.111	0.1773	0.5911	0.5911
54	E	G_C2_L0	6512.18	181.375	0.2101	0.7002	0.7002
54	E	G_C1_L1	6912.51	192.524	0.223	0.7433	0.7433
54	E	G_C2_L4	6701.69	186.653	0.2162	0.7206	0.7206
54	E	G_C2_L1	7064.23	196.75	0.2279	0.7596	0.7596
54	E	G_C1_L0	6932.4	193.079	0.2236	0.7454	0.7454
54	E	G_C0_L2	2626.3	73.1468	0.0847	0.2824	0.2824
54	E	G_C2_L3	5227.93	145.606	0.1686	0.5621	0.5621
54	E	D_L_BOT	8551.03	238.16	0.2758	0.9195	0.9195
54	E	L_B_4	3184.92	88.7051	0.1027	0.3425	0.3425
54	E	L_B_5	8088.36	225.274	0.2609	0.8697	0.8697
55	E	G_C1_L21	4312.16	120.101	0.1391	0.4637	0.4637
55	E	G_C1_L0	8239.52	229.484	0.2658	0.886	0.886
55	E	G_C0_L21	7820.12	217.803	0.2523	0.8409	0.8409
55	E	G_C0_L2	4588.39	127.794	0.148	0.4934	0.4934
55	E	G_C0_L3	6065.34	168.93	0.1957	0.6522	0.6522
55	E	G_C0_L0	4883.69	136.018	0.1575	0.5251	0.5251
55	E	G_C1_L4	5367.2	149.485	0.1731	0.5771	0.5771
55	E	G_C2_L1	6897.23	192.099	0.2225	0.7416	0.7416
55	E	D_L_BOT	6909.97	192.454	0.2229	0.743	0.743
55	E	L_F_2	5562.26	154.918	0.1794	0.5981	0.5981
56	E	G_C2_L0	9177.82	255.617	0.2961	0.9869	0.9869
56	E	G_C0_L21	5651.81	157.412	0.1823	0.6077	0.6077
56	E	G_C2_L21	6732.27	187.505	0.2172	0.7239	0.7239
56	E	G_C1_L4	9283.78	258.568	0.2995	0.9983	0.9983
56	E	G_C0_L3	7920.89	220.61	0.2555	0.8517	0.8517
56	E	G_C2_L0	7675.95	213.788	0.2476	0.8254	0.8254
56	E	G_C1_L3	6286.99	175.103	0.2028	0.676	0.676
56	E	G_C2_L3	8595.02	239.385	0.2773	0.9242	0.9242
56	E	D_R_BOT	6920.41	192.745	0.2232	0.7441	0.7441
56	E	L_F_3	1454.78	40.518	0.0469	0.1564	0.1564
56	E	L_B_3	3359.78	93.5753	0.1084	0.3613	0.3613
56	E	L_B_4	4748.51	132.254	0.1532	0.5106	0.5106
57	E	G_C1_L21	8294.17	231.006	0.2676	0.8918	0.8918
57	E	G_C0_L0	5241.74	145.991	0.1691	0.5636	0.5636
57	E	G_C2_L0	6163.26	171.657	0.1988	0.6627	0.6627
57	E	G_C1_L0	8654.69	241.047	0.2792	0.9306	0.9306
57	E	G_C1_L2	5802.38	161.606	0.1872	0.6239	0.6239
57	E	G_C2_L4	1948.15	54.259	0.0628	0.2095	0.2095
57	E	G_C2_L0	8656.97	241.111	0.2793	0.9309	0.9309
57	E	G_C1_L0	7385.18	205.689	0.2382	0.7941	0.7941
57	E	G_C0_L2	8338.49	232.24	0.269	0.8966	0.8966
57	E	G_C0_L0	9131.36	254.323	0.2946	0.9819	0.9819
57	E	G_C1_L4	6185.29	172.27	0.1995	0.6651	0.6651
57	E	L_B_4	7341.45	204.471	0.2368	0.7894	0.7894
57	E	L_B_3	8250.05	229.777	0.2661	0.8871	0.8871
58	E	G_C2_L0	8007.53	223.023	0.2583	0.861	0.861
58	E	G_C2_L21	8398.66	233.916	0.2709	0.9031	0.9031
58	E	G_C1_L0	6892.22	191.959	0.2223	0.7411	0.7411
58	E	G_C1_L1	4624.12	128.789	0.1492	0.4972	0.4972
58	E	G_C2_L1	7438.27	207.168	0.2399	0.7998	0.7998
58	E	G_C1_L2	6151.06	171.317	0.1984	0.6614	0.6614

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
58	E	G_C0_L2	2808.81	78.2299	0.0906	0.302	0.302
58	E	L_F_5	7074.85	197.046	0.2282	0.7607	0.7607
58	E	L_F_4	6181.12	172.154	0.1994	0.6646	0.6646
58	E	L_B_2	4163.81	115.969	0.1343	0.4477	0.4477
59	E	G_C2_L0	6949.92	193.566	0.2242	0.7473	0.7473
59	E	G_C0_L0	6248.99	174.044	0.2016	0.6719	0.6719
59	E	G_C1_L21	6170.77	171.866	0.1991	0.6635	0.6635
59	E	G_C1_L3	5387.07	150.039	0.1738	0.5793	0.5793
59	E	G_C2_L4	9173.6	255.5	0.2959	0.9864	0.9864
59	E	G_C1_L0	7618.19	212.179	0.2457	0.8192	0.8192
59	E	G_C0_L2	7699.04	214.431	0.2484	0.8279	0.8279
59	E	G_C0_L0	8169.76	227.541	0.2635	0.8785	0.8785
59	E	G_C1_L4	5686.04	158.365	0.1834	0.6114	0.6114
59	E	D_R_BOT	5135.32	143.027	0.1657	0.5522	0.5522
59	E	L_F_1	6345.65	176.737	0.2047	0.6823	0.6823
59	E	L_B_3	5366.12	149.455	0.1731	0.577	0.577
59	E	L_B_1	7150.08	199.141	0.2306	0.7688	0.7688
60	E	G_C2_L21	5093.07	141.85	0.1643	0.5476	0.5476
60	E	G_C2_L0	1840.1	51.2497	0.0594	0.1979	0.1979
60	E	G_C2_L1	6903.49	192.273	0.2227	0.7423	0.7423
60	E	G_C2_L4	8324.16	231.841	0.2685	0.8951	0.8951
60	E	G_C1_L4	5482.91	152.708	0.1769	0.5896	0.5896
60	E	G_C0_L4	6562.2	182.768	0.2117	0.7056	0.7056
60	E	G_C0_L2	4825.17	134.389	0.1557	0.5188	0.5188
60	E	L_B_1	1444.04	40.2188	0.0466	0.1553	0.1553
61	E	G_C1_L21	5190.56	144.565	0.1674	0.5581	0.5581
61	E	G_C0_L21	8708.76	242.553	0.2809	0.9364	0.9364
61	E	G_C2_L0	7674.43	213.745	0.2476	0.8252	0.8252
61	E	G_C2_L3	1146.22	31.924	0.037	0.1232	0.1232
61	E	G_C1_L3	6853.34	190.877	0.2211	0.7369	0.7369
61	E	G_C0_L4	5623.88	156.634	0.1814	0.6047	0.6047
61	E	G_C1_L1	9076.88	252.806	0.2928	0.976	0.976
61	E	G_C2_L2	5558.75	154.82	0.1793	0.5977	0.5977
61	E	G_C0_L3	4065.41	113.228	0.1311	0.4371	0.4371
61	E	G_C0_L0	7541.35	210.039	0.2433	0.8109	0.8109
61	E	G_C2_L1	8255.19	229.92	0.2663	0.8877	0.8877
61	E	L_F_1	6885.02	191.759	0.2221	0.7403	0.7403
61	E	L_F_4	6000.34	167.119	0.1936	0.6452	0.6452
61	E	L_B_4	3182.69	88.6431	0.1027	0.3422	0.3422
62	E	G_C1_L0	5988.59	166.792	0.1932	0.6439	0.6439
62	E	G_C1_L21	5020.97	139.842	0.162	0.5399	0.5399
62	E	G_C2_L0	5538.6	154.259	0.1787	0.5955	0.5955
62	E	G_C0_L3	5491.12	152.937	0.1771	0.5904	0.5904
62	E	G_C2_L3	6879.53	191.606	0.2219	0.7397	0.7397
62	E	G_C2_L4	6832.69	190.302	0.2204	0.7347	0.7347
62	E	G_C0_L4	5804.84	161.674	0.1873	0.6242	0.6242
62	E	G_C0_L0	7967.13	221.898	0.257	0.8567	0.8567
62	E	G_C1_L0	5944.66	165.569	0.1918	0.6392	0.6392
62	E	G_C2_L1	2593.36	72.2292	0.0837	0.2789	0.2789
62	E	G_C1_L3	6806.49	189.572	0.2196	0.7319	0.7319
62	E	G_C1_L1	8493.17	236.548	0.274	0.9132	0.9132
62	E	L_F_3	4591.81	127.889	0.1481	0.4937	0.4937
62	E	L_F_2	8229.45	229.203	0.2655	0.8849	0.8849
63	E	G_C1_L0	7555.27	210.426	0.2437	0.8124	0.8124
63	E	G_C2_L21	8706.41	242.488	0.2809	0.9362	0.9362
63	E	G_C0_L21	3913.86	109.007	0.1263	0.4208	0.4208
63	E	G_C0_L0	8331.94	232.058	0.2688	0.8959	0.8959
63	E	G_C2_L3	3615.2	100.689	0.1166	0.3887	0.3887
63	E	G_C0_L1	3731.34	103.924	0.1204	0.4012	0.4012
63	E	G_C0_L3	1148.19	31.979	0.037	0.1235	0.1235
63	E	G_C1_L1	7420.12	206.662	0.2394	0.7979	0.7979
63	E	G_C2_L1	7685.57	214.055	0.2479	0.8264	0.8264
63	E	G_C2_L2	7232.94	201.449	0.2333	0.7777	0.7777
63	E	G_C0_L4	2526.22	70.3592	0.0815	0.2716	0.2716
63	E	L_B_5	8260.32	230.063	0.2665	0.8882	0.8882
64	E	G_C1_L0	6152.72	171.363	0.1985	0.6616	0.6616
64	E	G_C0_L21	4351.65	121.201	0.1404	0.4679	0.4679
64	E	G_C2_L21	7629.57	212.496	0.2461	0.8204	0.8204

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
64	E	G_C0_L4	7356.12	204.88	0.2373	0.791	0.791
64	E	G_C0_L2	8509.04	236.99	0.2745	0.915	0.915
64	E	G_C2_L4	7523.58	209.544	0.2427	0.809	0.809
64	E	G_C1_L0	3654.8	101.792	0.1179	0.393	0.393
64	E	G_C2_L0	7134.16	198.698	0.2301	0.7671	0.7671
64	E	G_C0_L0	9152.5	254.912	0.2952	0.9841	0.9841
64	E	D_R_BOT	6588.04	183.488	0.2125	0.7084	0.7084
64	E	L_F_5	7865.77	219.074	0.2537	0.8458	0.8458
64	E	L_F_3	7026.7	195.705	0.2267	0.7556	0.7556
65	E	G_C1_L21	9039.99	251.778	0.2916	0.972	0.972
65	E	G_C0_L0	7594.3	211.513	0.245	0.8166	0.8166
65	E	G_C0_L21	1752.79	48.818	0.0565	0.1885	0.1885
65	E	G_C1_L0	8499.45	236.723	0.2742	0.9139	0.9139
65	E	G_C2_L4	7455.86	207.658	0.2405	0.8017	0.8017
65	E	G_C0_L4	6755.99	188.165	0.2179	0.7265	0.7265
65	E	G_C2_L0	8287.39	230.817	0.2673	0.8911	0.8911
65	E	G_C1_L0	5906.3	164.5	0.1905	0.6351	0.6351
65	E	G_C0_L2	8256.53	229.958	0.2663	0.8878	0.8878
65	E	G_C0_L1	3521.61	98.0824	0.1136	0.3787	0.3787
65	E	G_C2_L1	7818.65	217.762	0.2522	0.8407	0.8407
65	E	G_C1_L1	8887.32	247.526	0.2867	0.9556	0.9556
65	E	L_F_1	8820.25	245.658	0.2845	0.9484	0.9484
66	E	G_C0_L21	8284.02	230.723	0.2672	0.8908	0.8908
66	E	G_C1_L21	8217.01	228.857	0.2651	0.8835	0.8835
66	E	G_C2_L4	2679.61	74.6316	0.0864	0.2881	0.2881
66	E	G_C2_L3	6209.02	172.931	0.2003	0.6676	0.6676
66	E	G_C1_L3	8390.84	233.698	0.2707	0.9022	0.9022
66	E	G_C0_L1	8550.05	238.133	0.2758	0.9194	0.9194
66	E	G_C1_L2	7988.02	222.479	0.2577	0.8589	0.8589
66	E	G_C0_L3	6775.77	188.716	0.2186	0.7286	0.7286
66	E	G_C0_L4	4657.32	129.714	0.1502	0.5008	0.5008
66	E	G_C1_L4	3197.33	89.0509	0.1031	0.3438	0.3438
66	E	D_L_BOT	7123.11	198.39	0.2298	0.7659	0.7659
66	E	L_F_4	6314.56	175.871	0.2037	0.679	0.679
66	E	L_F_2	3415.87	95.1376	0.1102	0.3673	0.3673
66	E	L_B_3	6290.92	175.212	0.2029	0.6764	0.6764
67	E	G_C1_L0	6128.05	170.676	0.1977	0.6589	0.6589
67	E	G_C0_L0	6197.49	172.61	0.1999	0.6664	0.6664
67	E	G_C0_L21	8151.28	227.026	0.2629	0.8765	0.8765
67	E	G_C2_L0	6578.87	183.232	0.2122	0.7074	0.7074
67	E	G_C1_L1	4700.25	130.91	0.1516	0.5054	0.5054
67	E	G_C2_L3	5003.34	139.351	0.1614	0.538	0.538
67	E	G_C2_L2	8086.61	225.225	0.2609	0.8695	0.8695
67	E	G_C1_L4	5817.42	162.024	0.1877	0.6255	0.6255
67	E	G_C1_L0	7446.46	207.396	0.2402	0.8007	0.8007
67	E	L_B_1	6574.13	183.1	0.2121	0.7069	0.7069
68	E	G_C1_L21	7270.57	202.497	0.2345	0.7818	0.7818
68	E	G_C0_L0	9081.5	252.935	0.293	0.9765	0.9765
68	E	G_C2_L0	8977.75	250.045	0.2896	0.9653	0.9653
68	E	G_C2_L21	6801.72	189.439	0.2194	0.7314	0.7314
68	E	G_C1_L3	5939.84	165.434	0.1916	0.6387	0.6387
68	E	G_C0_L4	4321.25	120.354	0.1394	0.4647	0.4647
68	E	G_C0_L3	7584.47	211.24	0.2447	0.8155	0.8155
68	E	G_C0_L0	5831.23	162.409	0.1881	0.627	0.627
68	E	G_C2_L0	8167.48	227.477	0.2635	0.8782	0.8782
68	E	G_C0_L1	6247.77	174.011	0.2015	0.6718	0.6718
68	E	G_C1_L4	8618.73	240.046	0.278	0.9267	0.9267
68	E	G_C2_L4	3429.03	95.504	0.1106	0.3687	0.3687
68	E	G_C2_L3	8366.24	233.013	0.2699	0.8996	0.8996
68	E	D_L_BOT	3559.32	99.1328	0.1148	0.3827	0.3827
68	E	L_F_5	8214.29	228.781	0.265	0.8833	0.8833
69	E	G_C2_L0	8381.99	233.452	0.2704	0.9013	0.9013
69	E	G_C0_L21	3707.66	103.264	0.1196	0.3987	0.3987
69	E	G_C1_L0	5651.01	157.39	0.1823	0.6076	0.6076
69	E	G_C2_L21	2989.55	83.2638	0.0964	0.3215	0.3215
69	E	G_C2_L2	8723.27	242.957	0.2814	0.938	0.938
69	E	G_C1_L3	8926.37	248.614	0.2879	0.9598	0.9598
69	E	G_C0_L0	5452.36	151.857	0.1759	0.5863	0.5863

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
69	E	G_C2_L3	8411.28	234.268	0.2713	0.9044	0.9044
69	E	G_C0_L4	7631.01	212.536	0.2462	0.8205	0.8205
69	E	G_C2_L4	8065.26	224.63	0.2602	0.8672	0.8672
69	E	G_C2_L1	6820.28	189.956	0.22	0.7334	0.7334
69	E	G_C0_L2	5858.11	163.158	0.189	0.6299	0.6299
69	E	D_R_BOT	7680.53	213.915	0.2478	0.8259	0.8259
69	E	L_F_1	3082.9	85.8638	0.0994	0.3315	0.3315
69	E	L_F_2	6151.67	171.334	0.1984	0.6615	0.6615
70	E	G_C2_L0	1101.64	30.6824	0.0355	0.1185	0.1185
70	E	G_C1_L0	8157.11	227.189	0.2631	0.8771	0.8771
70	E	G_C2_L3	4375.1	121.854	0.1411	0.4704	0.4704
70	E	G_C2_L2	9122.04	254.064	0.2943	0.9809	0.9809
70	E	G_C0_L1	5911.9	164.656	0.1907	0.6357	0.6357
70	E	G_C2_L4	4989.11	138.955	0.1609	0.5365	0.5365
70	E	G_C0_L2	8649.12	240.892	0.279	0.93	0.93
70	E	G_C1_L1	5233.64	145.765	0.1688	0.5628	0.5628
70	E	G_C1_L4	9038.89	251.748	0.2916	0.9719	0.9719
70	E	G_C2_L0	8434.51	234.915	0.2721	0.9069	0.9069
70	E	G_C1_L3	4528.45	126.125	0.1461	0.4869	0.4869
70	E	D_L_BOT	9201.41	256.274	0.2968	0.9894	0.9894
70	E	L_B_5	8950.66	249.29	0.2887	0.9624	0.9624
70	E	L_F_4	2213.19	61.6408	0.0714	0.238	0.238
70	E	L_F_3	2006.86	55.8943	0.0647	0.2158	0.2158
71	E	G_C0_L21	3445.1	95.9517	0.1111	0.3704	0.3704
71	E	G_C2_L0	5406.74	150.586	0.1744	0.5814	0.5814
71	E	G_C1_L0	7461.44	207.813	0.2407	0.8023	0.8023
71	E	G_C1_L21	7542.04	210.058	0.2433	0.811	0.811
71	E	G_C0_L1	7397.06	206.02	0.2386	0.7954	0.7954
71	E	G_C0_L4	6495.13	180.9	0.2095	0.6984	0.6984
71	E	G_C0_L0	7293.58	203.138	0.2353	0.7843	0.7843
71	E	G_C2_L4	2586.12	72.0277	0.0834	0.2781	0.2781
71	E	G_C1_L0	7243.44	201.742	0.2337	0.7789	0.7789
71	E	D_R_BOT	7136.98	198.776	0.2302	0.7674	0.7674
71	E	L_B_3	3667.57	102.148	0.1183	0.3944	0.3944
71	E	L_B_2	5239.4	145.926	0.169	0.5634	0.5634
71	E	L_F_5	6312.31	175.808	0.2036	0.6787	0.6787
72	E	G_C0_L21	7742.33	215.636	0.2498	0.8325	0.8325
72	E	G_C2_L21	7202.23	200.594	0.2323	0.7744	0.7744
72	E	G_C1_L0	8543.8	237.958	0.2756	0.9187	0.9187
72	E	G_C2_L0	8096.02	225.487	0.2612	0.8705	0.8705
72	E	G_C1_L2	5821.12	162.128	0.1878	0.6259	0.6259
72	E	G_C1_L1	6885.19	191.764	0.2221	0.7403	0.7403
72	E	G_C0_L1	3858.57	107.467	0.1245	0.4149	0.4149
72	E	G_C1_L3	5191.79	144.6	0.1675	0.5583	0.5583
72	E	G_C2_L3	8294.78	231.023	0.2676	0.8919	0.8919
72	E	G_C2_L4	6101.44	169.935	0.1968	0.6561	0.6561
72	E	G_C0_L4	3888.78	108.309	0.1254	0.4181	0.4181
72	E	G_C2_L0	7499.83	208.882	0.2419	0.8064	0.8064
72	E	G_C0_L0	8946.72	249.181	0.2886	0.962	0.962
72	E	D_R_BOT	9239.62	257.338	0.2981	0.9935	0.9935
72	E	L_F_3	9133.52	254.383	0.2946	0.9821	0.9821
72	E	L_B_5	6463.28	180.013	0.2085	0.695	0.695
73	E	G_C0_L0	8935.95	248.881	0.2883	0.9609	0.9609
73	E	G_C2_L0	9030.57	251.516	0.2913	0.971	0.971
73	E	G_C0_L2	4174.6	116.269	0.1347	0.4489	0.4489
73	E	G_C0_L0	4716.27	131.356	0.1521	0.5071	0.5071
73	E	G_C2_L0	6805.14	189.534	0.2195	0.7317	0.7317
73	E	G_C1_L0	7384.73	205.677	0.2382	0.7941	0.7941
73	E	G_C2_L2	3520.23	98.0441	0.1136	0.3785	0.3785
73	E	G_C2_L3	8633.16	240.447	0.2785	0.9283	0.9283
73	E	G_C0_L3	5185.29	144.419	0.1673	0.5576	0.5576
73	E	L_F_1	2744.8	76.447	0.0885	0.2951	0.2951
73	E	L_F_4	7135.91	198.747	0.2302	0.7673	0.7673
73	E	L_B_1	8399.44	233.938	0.2709	0.9032	0.9032
74	E	G_C1_L0	6235.92	173.68	0.2012	0.6705	0.6705
74	E	G_C0_L21	7558.21	210.508	0.2438	0.8127	0.8127
74	E	G_C2_L21	5251.87	146.273	0.1694	0.5647	0.5647
74	E	G_C0_L2	5214.5	145.232	0.1682	0.5607	0.5607

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
74	E	G_C1_L2	7790.01	216.964	0.2513	0.8376	0.8376
74	E	G_C1_L3	7473.54	208.15	0.2411	0.8036	0.8036
74	E	G_C2_L3	5691.43	158.516	0.1836	0.612	0.612
74	E	G_C1_L1	6547.98	182.372	0.2112	0.7041	0.7041
74	E	G_C2_L4	8200.14	228.387	0.2645	0.8817	0.8817
74	E	G_C2_L2	8678.85	241.72	0.28	0.9332	0.9332
74	E	G_C0_L0	2860.66	79.6741	0.0923	0.3076	0.3076
74	E	G_C0_L1	4815.1	134.108	0.1553	0.5178	0.5178
74	E	D_L_BOT	9096	253.338	0.2934	0.9781	0.9781
74	E	L_F_3	8711.27	242.623	0.281	0.9367	0.9367
74	E	L_B_4	8937.02	248.91	0.2883	0.961	0.961
75	E	G_C1_L21	2772.16	77.2092	0.0894	0.2981	0.2981
75	E	G_C2_L0	7462.62	207.846	0.2407	0.8024	0.8024
75	E	G_C1_L0	5775.28	160.851	0.1863	0.621	0.621
75	E	G_C2_L4	6895.72	192.057	0.2224	0.7415	0.7415
75	E	G_C0_L0	1338.09	37.268	0.0432	0.1439	0.1439
75	E	G_C0_L4	6995.71	194.842	0.2257	0.7522	0.7522
75	E	G_C0_L3	6299.76	175.458	0.2032	0.6774	0.6774
75	E	G_C1_L0	5849.45	162.917	0.1887	0.629	0.629
75	E	G_C2_L1	8417.27	234.435	0.2715	0.9051	0.9051
75	E	D_R_BOT	9087.47	253.101	0.2931	0.9771	0.9771
75	E	L_F_2	7067.58	196.843	0.228	0.76	0.76
75	E	L_B_3	8925.28	248.583	0.2879	0.9597	0.9597
76	E	G_C2_L0	7693.17	214.267	0.2482	0.8272	0.8272
76	E	G_C0_L0	6980.67	194.423	0.2252	0.7506	0.7506
76	E	G_C2_L21	7217.18	201.01	0.2328	0.776	0.776
76	E	G_C1_L0	4817.49	134.175	0.1554	0.518	0.518
76	E	G_C2_L1	7331.84	204.203	0.2365	0.7884	0.7884
76	E	G_C1_L4	9093.83	253.278	0.2933	0.9778	0.9778
76	E	G_C0_L2	9279.83	258.458	0.2993	0.9978	0.9978
76	E	G_C2_L4	5347.92	148.948	0.1725	0.575	0.575
76	E	G_C0_L4	6224.25	173.356	0.2008	0.6693	0.6693
76	E	G_C2_L3	4831.8	134.573	0.1559	0.5195	0.5195
76	E	L_F_1	6966.73	194.035	0.2247	0.7491	0.7491
77	E	G_C1_L0	8303.87	231.276	0.2679	0.8929	0.8929
77	E	G_C2_L21	6813.46	189.766	0.2198	0.7326	0.7326
77	E	G_C0_L0	2371.36	66.0461	0.0765	0.255	0.255
77	E	G_C1_L0	4279.05	119.178	0.138	0.4601	0.4601
77	E	G_C2_L3	6686.19	186.221	0.2157	0.7189	0.7189
77	E	G_C0_L0	8626	240.248	0.2783	0.9275	0.9275
77	E	G_C0_L3	6075.2	169.204	0.196	0.6532	0.6532
77	E	G_C1_L4	6271.27	174.665	0.2023	0.6743	0.6743
77	E	G_C0_L1	3872.59	107.858	0.1249	0.4164	0.4164
77	E	G_C2_L1	8016.17	223.263	0.2586	0.862	0.862
77	E	G_C0_L4	3398.58	94.6558	0.1096	0.3654	0.3654
77	E	D_R_BOT	6354.48	176.982	0.205	0.6833	0.6833
77	E	L_B_4	3550.2	98.8789	0.1145	0.3817	0.3817
78	E	G_C2_L21	4437.7	123.597	0.1432	0.4772	0.4772
78	E	G_C1_L0	6758.27	188.229	0.218	0.7267	0.7267
78	E	G_C2_L4	2824.66	78.6714	0.0911	0.3037	0.3037
78	E	G_C1_L0	7625.73	212.389	0.246	0.82	0.82
78	E	G_C0_L4	6396.39	178.15	0.2063	0.6878	0.6878
78	E	G_C0_L1	8029.6	223.637	0.259	0.8634	0.8634
78	E	G_C2_L0	2560.33	71.3092	0.0826	0.2753	0.2753
78	E	G_C2_L3	7364.42	205.111	0.2376	0.7919	0.7919
78	E	G_C2_L2	6497.6	180.969	0.2096	0.6987	0.6987
78	E	G_C1_L1	4532.95	126.25	0.1462	0.4874	0.4874
78	E	G_C2_L1	8546.98	238.047	0.2757	0.919	0.919
78	E	D_L_BOT	6718.54	187.122	0.2167	0.7224	0.7224
78	E	L_F_1	8856.28	246.662	0.2857	0.9523	0.9523
78	E	L_F_5	8747.05	243.619	0.2822	0.9405	0.9405
78	E	L_B_1	9138.79	254.53	0.2948	0.9827	0.9827
79	E	G_C0_L21	7740.98	215.599	0.2497	0.8324	0.8324
79	E	G_C1_L0	3519.37	98.0202	0.1135	0.3784	0.3784
79	E	G_C2_L21	9284.07	258.576	0.2995	0.9983	0.9983
79	E	G_C1_L4	1794.99	49.9934	0.0579	0.193	0.193
79	E	G_C2_L3	1797.94	50.0755	0.058	0.1933	0.1933
79	E	G_C0_L3	7540.33	210.011	0.2432	0.8108	0.8108

Iteration_I	Hazard_Z	Component	Applied_EX_	Applied_ke_N	Applied_ks_M	Applied_kbond_N	Damage_Fact
D	one	ID	MPa	_mm	N_m3	_m_m	or_D
79	E	G_C0_L4	5114.25	142.44	0.165	0.5499	0.5499
79	E	G_C0_L1	5181.96	144.326	0.1672	0.5572	0.5572
79	E	L_F_3	5853.98	163.043	0.1888	0.6295	0.6295
79	E	L_B_2	6644.6	185.063	0.2143	0.7145	0.7145
80	E	G_C1_L21	4598.59	128.078	0.1483	0.4945	0.4945
80	E	G_C0_L21	6113.09	170.26	0.1972	0.6573	0.6573
80	E	G_C2_L0	3325.45	92.6193	0.1073	0.3576	0.3576
80	E	G_C1_L3	6847.85	190.724	0.2209	0.7363	0.7363
80	E	G_C1_L4	6351.61	176.903	0.2049	0.683	0.683
80	E	G_C0_L0	8594.72	239.377	0.2772	0.9242	0.9242
80	E	G_C1_L0	2954.77	82.295	0.0953	0.3177	0.3177
80	E	G_C0_L4	1768.77	49.2631	0.0571	0.1902	0.1902
80	E	G_C1_L1	6774.34	188.676	0.2185	0.7284	0.7284
80	E	G_C2_L1	9278.97	258.434	0.2993	0.9977	0.9977
80	E	L_F_2	6005.98	167.276	0.1937	0.6458	0.6458
81	E	G_C2_L21	7457.97	207.716	0.2406	0.8019	0.8019
81	E	G_C1_L21	7502.93	208.969	0.242	0.8068	0.8068
81	E	G_C0_L0	7823.8	217.905	0.2524	0.8413	0.8413
81	E	G_C1_L0	6652.93	185.295	0.2146	0.7154	0.7154
81	E	G_C1_L4	8648.98	240.888	0.279	0.93	0.93
81	E	G_C0_L0	7604.71	211.803	0.2453	0.8177	0.8177
81	E	G_C1_L0	8418.02	234.455	0.2715	0.9052	0.9052
81	E	G_C2_L2	2363.98	65.8407	0.0763	0.2542	0.2542
81	E	G_C0_L3	7232.21	201.429	0.2333	0.7777	0.7777
81	E	G_C2_L0	5644.63	157.212	0.1821	0.6069	0.6069
81	E	G_C1_L2	5941.68	165.485	0.1917	0.6389	0.6389
81	E	G_C2_L3	5746.15	160.04	0.1854	0.6179	0.6179
81	E	D_R_BOT	5358.45	149.242	0.1729	0.5762	0.5762
81	E	L_F_3	7777.66	216.62	0.2509	0.8363	0.8363
82	E	G_C0_L21	5786.37	161.16	0.1867	0.6222	0.6222
82	E	G_C2_L21	8152.37	227.057	0.263	0.8766	0.8766
82	E	G_C1_L21	2839.37	79.081	0.0916	0.3053	0.3053
82	E	G_C2_L1	6859.81	191.057	0.2213	0.7376	0.7376
82	E	G_C2_L0	9241.28	257.384	0.2981	0.9937	0.9937
82	E	G_C2_L4	8910.04	248.159	0.2874	0.9581	0.9581
82	E	G_C1_L2	4410.17	122.83	0.1423	0.4742	0.4742
82	E	G_C0_L4	7037.23	195.998	0.227	0.7567	0.7567
82	E	G_C2_L2	8200.98	228.41	0.2645	0.8818	0.8818
82	E	G_C1_L1	7344.32	204.551	0.2369	0.7897	0.7897
82	E	G_C1_L0	805.368	22.4308	0.026	0.0866	0.0866
82	E	L_F_3	7263.82	202.309	0.2343	0.7811	0.7811
83	E	G_C2_L21	6514.34	181.435	0.2101	0.7005	0.7005
83	E	G_C1_L21	8928.99	248.687	0.288	0.9601	0.9601
83	E	G_C2_L0	5758.38	160.38	0.1858	0.6192	0.6192
83	E	G_C1_L3	5719.74	159.304	0.1845	0.615	0.615
83	E	G_C0_L0	6955.54	193.723	0.2244	0.7479	0.7479
83	E	G_C0_L2	5629.79	156.799	0.1816	0.6054	0.6054
83	E	G_C0_L1	6004.69	167.24	0.1937	0.6457	0.6457
83	E	G_C2_L1	7992.77	222.611	0.2578	0.8594	0.8594
83	E	G_C2_L0	3257.87	90.7369	0.1051	0.3503	0.3503
83	E	D_R_BOT	9061.97	252.391	0.2923	0.9744	0.9744
83	E	L_B_5	4624.68	128.805	0.1492	0.4973	0.4973
84	E	G_C2_L0	7291.03	203.067	0.2352	0.784	0.784
84	E	G_C2_L21	7266.98	202.397	0.2344	0.7814	0.7814
84	E	G_C2_L3	8638.03	240.583	0.2786	0.9288	0.9288
84	E	G_C2_L1	5553.9	154.685	0.1792	0.5972	0.5972
84	E	G_C2_L2	7389.8	205.818	0.2384	0.7946	0.7946
84	E	G_C1_L1	3954.95	110.152	0.1276	0.4253	0.4253
84	E	G_C1_L3	6403.38	178.344	0.2066	0.6885	0.6885
84	E	G_C0_L4	7341.17	204.464	0.2368	0.7894	0.7894
84	E	G_C1_L4	3337.61	92.9578	0.1077	0.3589	0.3589
84	E	G_C2_L4	7397.69	206.037	0.2386	0.7955	0.7955
84	E	L_F_3	8663.66	241.297	0.2795	0.9316	0.9316
84	E	L_B_1	7843.02	218.441	0.253	0.8433	0.8433
85	E	G_C2_L0	7982.31	222.32	0.2575	0.8583	0.8583
85	E	G_C0_L21	7866.82	219.103	0.2538	0.8459	0.8459
85	E	G_C1_L21	7114.42	198.148	0.2295	0.765	0.765
85	E	G_C0_L3	8880.99	247.35	0.2865	0.9549	0.9549

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
85	E	G_C0_L0	7131.42	198.621	0.23	0.7668	0.7668
85	E	G_C1_L2	6933.99	193.123	0.2237	0.7456	0.7456
85	E	G_C1_L1	7065.7	196.791	0.2279	0.7598	0.7598
85	E	G_C2_L1	2942.24	81.9461	0.0949	0.3164	0.3164
85	E	G_C1_L3	7176.68	199.882	0.2315	0.7717	0.7717
85	E	G_C2_L4	4924.07	137.143	0.1588	0.5295	0.5295
85	E	G_C2_L3	5983.33	166.645	0.193	0.6434	0.6434
85	E	D_R_BOT	9165.06	255.262	0.2956	0.9855	0.9855
85	E	L_B_2	9102.72	253.525	0.2936	0.9788	0.9788
85	E	L_B_3	8589.26	239.225	0.2771	0.9236	0.9236
85	E	L_B_4	8711.63	242.633	0.281	0.9367	0.9367
86	E	G_C0_L0	7425.47	206.811	0.2395	0.7984	0.7984
86	E	G_C2_L21	6216.06	173.127	0.2005	0.6684	0.6684
86	E	G_C0_L21	4616.29	128.571	0.1489	0.4964	0.4964
86	E	G_C0_L2	6972.24	194.188	0.2249	0.7497	0.7497
86	E	G_C0_L1	7576.13	211.007	0.2444	0.8146	0.8146
86	E	G_C2_L0	4639.44	129.216	0.1497	0.4989	0.4989
86	E	G_C2_L2	8087.47	225.249	0.2609	0.8696	0.8696
86	E	G_C1_L3	9094.72	253.303	0.2934	0.9779	0.9779
86	E	G_C1_L1	5349.94	149.005	0.1726	0.5753	0.5753
86	E	D_L_BOT	4663.14	129.876	0.1504	0.5014	0.5014
86	E	L_B_5	2435.66	67.837	0.0786	0.2619	0.2619
86	E	L_F_1	6969.17	194.103	0.2248	0.7494	0.7494
87	E	G_C2_L0	6959.61	193.836	0.2245	0.7483	0.7483
87	E	G_C0_L21	5015.15	139.68	0.1618	0.5393	0.5393
87	E	G_C2_L21	5129.64	142.869	0.1655	0.5516	0.5516
87	E	G_C1_L21	7587.91	211.335	0.2448	0.8159	0.8159
87	E	G_C2_L3	7134.39	198.704	0.2301	0.7671	0.7671
87	E	G_C1_L1	8661.48	241.236	0.2794	0.9313	0.9313
87	E	G_C0_L1	7897.1	219.947	0.2547	0.8492	0.8492
87	E	G_C0_L0	6756.84	188.189	0.218	0.7265	0.7265
87	E	G_C2_L0	7945	221.281	0.2563	0.8543	0.8543
87	E	G_C0_L3	5197.99	144.773	0.1677	0.5589	0.5589
87	E	G_C0_L4	8527.27	237.498	0.2751	0.9169	0.9169
87	E	G_C1_L0	5419.72	150.948	0.1748	0.5828	0.5828
87	E	G_C2_L2	8062.73	224.56	0.2601	0.867	0.867
87	E	D_L_BOT	8615.63	239.959	0.2779	0.9264	0.9264
87	E	L_B_5	3540.28	98.6024	0.1142	0.3807	0.3807
87	E	L_F_2	2215.78	61.7131	0.0715	0.2383	0.2383
88	E	G_C1_L21	8448.42	235.302	0.2725	0.9084	0.9084
88	E	G_C0_L21	2359.53	65.7167	0.0761	0.2537	0.2537
88	E	G_C2_L0	6044.76	168.356	0.195	0.65	0.65
88	E	G_C1_L0	6356.1	177.028	0.205	0.6835	0.6835
88	E	G_C1_L3	2848.6	79.3382	0.0919	0.3063	0.3063
88	E	G_C1_L1	4763.71	132.677	0.1537	0.5122	0.5122
88	E	G_C0_L4	7497.08	208.806	0.2418	0.8061	0.8061
88	E	G_C2_L0	3349.95	93.3015	0.1081	0.3602	0.3602
88	E	G_C0_L0	4658.43	129.745	0.1503	0.5009	0.5009
88	E	G_C2_L3	8397.34	233.88	0.2709	0.9029	0.9029
88	E	G_C2_L4	8536.13	237.745	0.2754	0.9179	0.9179
88	E	L_F_1	3198.67	89.0881	0.1032	0.3439	0.3439
88	E	L_F_2	6140.83	171.032	0.1981	0.6603	0.6603
89	E	G_C2_L0	3036.19	84.5629	0.0979	0.3265	0.3265
89	E	G_C0_L0	2184.7	60.8473	0.0705	0.2349	0.2349
89	E	G_C0_L4	9111.07	253.758	0.2939	0.9797	0.9797
89	E	G_C2_L4	6766.35	188.454	0.2183	0.7276	0.7276
89	E	G_C2_L1	4727.25	131.662	0.1525	0.5083	0.5083
89	E	G_C0_L2	8470.89	235.928	0.2733	0.9108	0.9108
89	E	G_C1_L4	6927.95	192.954	0.2235	0.7449	0.7449
89	E	L_B_1	6242.13	173.853	0.2014	0.6712	0.6712
90	E	G_C0_L0	6354.18	176.974	0.205	0.6832	0.6832
90	E	G_C1_L21	6166.21	171.739	0.1989	0.663	0.663
90	E	G_C2_L0	6661.44	185.532	0.2149	0.7163	0.7163
90	E	G_C1_L1	3302.28	91.9738	0.1065	0.3551	0.3551
90	E	G_C1_L0	7737.66	215.506	0.2496	0.832	0.832
90	E	G_C0_L3	8501.36	236.777	0.2742	0.9141	0.9141
90	E	G_C1_L3	6021.29	167.703	0.1942	0.6475	0.6475
90	E	G_C0_L4	7273	202.565	0.2346	0.782	0.782

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
90	E	G_C0_L0	6013.25	167.479	0.194	0.6466	0.6466
90	E	D_R_BOT	7325.22	204.019	0.2363	0.7877	0.7877
90	E	L_B_1	6037.04	168.141	0.1947	0.6491	0.6491
91	E	G_C2_L21	8035.81	223.81	0.2592	0.8641	0.8641
91	E	G_C1_L0	8985.21	250.252	0.2898	0.9662	0.9662
91	E	G_C0_L0	8488.82	236.427	0.2738	0.9128	0.9128
91	E	G_C1_L21	4694.27	130.743	0.1514	0.5048	0.5048
91	E	G_C1_L1	8967.85	249.769	0.2893	0.9643	0.9643
91	E	G_C1_L4	8108.44	225.833	0.2616	0.8719	0.8719
91	E	G_C0_L3	8956.47	249.452	0.2889	0.9631	0.9631
91	E	G_C0_L1	8131.2	226.467	0.2623	0.8743	0.8743
91	E	G_C1_L3	5897.84	164.264	0.1903	0.6342	0.6342
91	E	L_B_3	7976.77	222.166	0.2573	0.8577	0.8577
92	E	G_C1_L0	7404.8	206.236	0.2389	0.7962	0.7962
92	E	G_C2_L0	7520.34	209.454	0.2426	0.8086	0.8086
92	E	G_C0_L4	2242.34	62.4529	0.0723	0.2411	0.2411
92	E	G_C2_L2	8375.18	233.262	0.2702	0.9006	0.9006
92	E	G_C0_L1	7294.74	203.17	0.2353	0.7844	0.7844
92	E	G_C1_L4	8203.69	228.486	0.2646	0.8821	0.8821
92	E	G_C1_L3	5993.96	166.941	0.1934	0.6445	0.6445
92	E	G_C2_L1	5322.16	148.231	0.1717	0.5723	0.5723
92	E	D_L_BOT	6035.07	168.087	0.1947	0.6489	0.6489
92	E	L_F_3	8742.22	243.485	0.282	0.94	0.94
92	E	L_F_5	4203.69	117.079	0.1356	0.452	0.452
92	E	L_B_2	5907.21	164.525	0.1906	0.6352	0.6352
93	E	G_C1_L21	9020.09	251.224	0.291	0.9699	0.9699
93	E	G_C2_L21	8506.19	236.911	0.2744	0.9146	0.9146
93	E	G_C0_L21	8424.27	234.629	0.2718	0.9058	0.9058
93	E	G_C1_L0	7867.4	219.12	0.2538	0.846	0.846
93	E	G_C2_L2	2439.04	67.9311	0.0787	0.2623	0.2623
93	E	G_C1_L2	2119.38	59.0281	0.0684	0.2279	0.2279
93	E	G_C0_L0	7716.42	214.915	0.2489	0.8297	0.8297
93	E	G_C0_L3	5044.86	140.507	0.1627	0.5425	0.5425
93	E	G_C0_L4	5143.04	143.242	0.1659	0.553	0.553
93	E	G_C1_L3	8960.25	249.558	0.289	0.9635	0.9635
93	E	G_C0_L2	6258.35	174.305	0.2019	0.6729	0.6729
93	E	G_C0_L1	6912.75	192.531	0.223	0.7433	0.7433
93	E	D_L_BOT	4491.04	125.083	0.1449	0.4829	0.4829
93	E	L_F_2	8435.06	234.93	0.2721	0.907	0.907
93	E	L_B_5	8255.4	229.926	0.2663	0.8877	0.8877
94	E	G_C1_L0	9296.61	258.926	0.2999	0.9996	0.9996
94	E	G_C2_L0	6056.39	168.68	0.1954	0.6512	0.6512
94	E	G_C1_L3	7004.77	195.094	0.226	0.7532	0.7532
94	E	G_C2_L2	8924.13	248.551	0.2879	0.9596	0.9596
94	E	G_C1_L0	2970.33	82.7284	0.0958	0.3194	0.3194
94	E	G_C0_L4	2633.89	73.358	0.085	0.2832	0.2832
94	E	G_C2_L4	8991.05	250.415	0.29	0.9668	0.9668
94	E	G_C0_L2	6474.78	180.333	0.2089	0.6962	0.6962
94	E	L_B_3	2904.86	80.905	0.0937	0.3124	0.3124
95	E	G_C2_L21	5359.28	149.265	0.1729	0.5763	0.5763
95	E	G_C1_L21	5402.23	150.461	0.1743	0.5809	0.5809
95	E	G_C1_L1	7523.97	209.555	0.2427	0.809	0.809
95	E	G_C2_L4	8471.09	235.934	0.2733	0.9109	0.9109
95	E	G_C2_L2	6117.21	170.374	0.1973	0.6578	0.6578
95	E	G_C1_L0	4760.37	132.584	0.1536	0.5119	0.5119
95	E	G_C1_L4	4936.48	137.489	0.1592	0.5308	0.5308
95	E	D_R_BOT	5259.78	146.493	0.1697	0.5656	0.5656
95	E	L_B_4	8074.34	224.883	0.2605	0.8682	0.8682
95	E	L_F_4	3131.51	87.2175	0.101	0.3367	0.3367
95	E	L_B_1	4212.14	117.315	0.1359	0.4529	0.4529
96	E	G_C2_L0	6831.16	190.259	0.2204	0.7345	0.7345
96	E	G_C1_L0	6682.07	186.106	0.2156	0.7185	0.7185
96	E	G_C1_L2	4906.87	136.664	0.1583	0.5276	0.5276
96	E	G_C0_L4	8762.16	244.04	0.2827	0.9422	0.9422
96	E	G_C1_L1	7446.33	207.392	0.2402	0.8007	0.8007
96	E	G_C1_L3	5714.75	159.165	0.1843	0.6145	0.6145
96	E	G_C0_L2	1139.88	31.7476	0.0368	0.1226	0.1226
96	E	G_C0_L3	6843.79	190.611	0.2208	0.7359	0.7359

Iteration_I D	Hazard_Z one	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Applied_ks_M N_m3	Applied_kbond_N _m_m	Damage_Fact or_D
96	E	G_C2_L3	3323.3	92.5592	0.1072	0.3573	0.3573
96	E	G_C2_L0	3015.36	83.9826	0.0973	0.3242	0.3242
96	E	L_F_1	7334.85	204.287	0.2366	0.7887	0.7887
96	E	L_B_2	5942.78	165.516	0.1917	0.639	0.639
97	E	G_C2_L21	8989.9	250.383	0.29	0.9667	0.9667
97	E	G_C0_L0	5435.16	151.378	0.1753	0.5844	0.5844
97	E	G_C0_L2	5718.07	159.258	0.1845	0.6148	0.6148
97	E	G_C0_L3	6839.43	190.489	0.2206	0.7354	0.7354
97	E	G_C2_L0	6586.15	183.435	0.2125	0.7082	0.7082
97	E	G_C1_L0	6921.84	192.785	0.2233	0.7443	0.7443
97	E	G_C0_L0	4259.23	118.626	0.1374	0.458	0.458
97	E	G_C2_L1	3019.56	84.0995	0.0974	0.3247	0.3247
97	E	G_C2_L4	3234.96	90.0988	0.1044	0.3478	0.3478
97	E	G_C0_L4	4129.04	115.001	0.1332	0.444	0.444
97	E	G_C2_L2	9034.11	251.615	0.2914	0.9714	0.9714
97	E	L_B_3	6691.35	186.365	0.2159	0.7195	0.7195
97	E	L_F_5	5271.86	146.83	0.1701	0.5669	0.5669
98	E	G_C1_L21	7594.67	211.524	0.245	0.8166	0.8166
98	E	G_C2_L21	7904.88	220.164	0.255	0.85	0.85
98	E	G_C1_L0	7701.34	214.495	0.2484	0.8281	0.8281
98	E	G_C0_L0	7070.25	196.918	0.2281	0.7602	0.7602
98	E	G_C1_L2	5691.54	158.519	0.1836	0.612	0.612
98	E	G_C2_L1	7134.99	198.721	0.2302	0.7672	0.7672
98	E	G_C1_L3	7472.43	208.119	0.241	0.8035	0.8035
98	E	G_C0_L3	7093.8	197.574	0.2288	0.7628	0.7628
98	E	G_C0_L0	9182.87	255.758	0.2962	0.9874	0.9874
98	E	G_C1_L1	3692.77	102.85	0.1191	0.3971	0.3971
98	E	G_C1_L4	4182.46	116.488	0.1349	0.4497	0.4497
98	E	L_B_3	3618.21	100.773	0.1167	0.3891	0.3891
99	E	G_C0_L21	7329.25	204.131	0.2364	0.7881	0.7881
99	E	G_C1_L0	6111.42	170.213	0.1971	0.6571	0.6571
99	E	G_C2_L0	5840.28	162.661	0.1884	0.628	0.628
99	E	G_C0_L0	9101.82	253.5	0.2936	0.9787	0.9787
99	E	G_C0_L1	8354.43	232.684	0.2695	0.8983	0.8983
99	E	G_C1_L4	8169.59	227.536	0.2635	0.8785	0.8785
99	E	G_C2_L2	8913.88	248.266	0.2875	0.9585	0.9585
99	E	G_C2_L1	4929.92	137.306	0.159	0.5301	0.5301
99	E	G_C1_L1	6451.16	179.675	0.2081	0.6937	0.6937
99	E	G_C0_L4	5395.66	150.278	0.1741	0.5802	0.5802
99	E	D_L_BOT	5561.69	154.902	0.1794	0.598	0.598
99	E	L_F_3	5386.67	150.027	0.1738	0.5792	0.5792
99	E	L_B_5	8670.01	241.474	0.2797	0.9323	0.9323
99	E	L_B_3	9183.37	255.772	0.2962	0.9875	0.9875
100	E	G_C1_L0	8357.81	232.779	0.2696	0.8987	0.8987
100	E	G_C2_L21	5556.86	154.768	0.1793	0.5975	0.5975
100	E	G_C2_L4	6041.68	168.27	0.1949	0.6496	0.6496
100	E	G_C1_L4	5761.52	160.468	0.1859	0.6195	0.6195
100	E	G_C0_L0	6488.97	180.728	0.2093	0.6977	0.6977
100	E	G_C1_L1	5368.76	149.529	0.1732	0.5773	0.5773
100	E	G_C0_L2	7684.09	214.014	0.2479	0.8262	0.8262
100	E	G_C2_L1	6609.76	184.093	0.2132	0.7107	0.7107
100	E	G_C0_L1	5165.91	143.879	0.1666	0.5555	0.5555
100	E	G_C2_L2	6877.93	191.561	0.2219	0.7396	0.7396
100	E	L_B_2	8209.37	228.644	0.2648	0.8827	0.8827

C.3.25 stochastic_traceability_log_GS_A.csv

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
1	A	G_C0_L21	1087.67	30.512	0.117	101	101
1	A	G_C2_L0	5832.17	163.608	0.6271	102	102
1	A	G_C1_L21	5083.75	142.613	0.5466	103	103
1	A	G_C2_L21	7112.34	199.52	0.7648	104	104
2	A	G_C2_L21	5633.18	158.026	0.6057	105	105
2	A	G_C0_L0	7635.24	214.189	0.821	106	106
3	A	G_C1_L21	4657.86	130.666	0.5008	107	107

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
3	A	G_C0_L21	9112.96	255.643	0.9799	108	108
3	A	G_C1_L0	7019.06	196.904	0.7547	109	109
3	A	G_C2_L0	8606.13	241.425	0.9254	110	110
4	A	G_C1_L21	5607.2	157.297	0.6029	111	111
4	A	G_C0_L21	9119.99	255.84	0.9806	112	112
5	A	G_C1_L21	8003.54	224.521	0.8606	113	113
5	A	G_C2_L21	3633.99	101.943	0.3908	114	114
5	A	G_C2_L0	6307.5	176.942	0.6782	115	115
6	A	G_C0_L0	7888.18	221.285	0.8482	116	116
6	A	G_C2_L21	8597.89	241.194	0.9245	117	117
7	A	G_C1_L0	8257.45	231.644	0.8879	118	118
7	A	G_C0_L0	7961.74	223.348	0.8561	119	119
7	A	G_C0_L21	5470.2	153.454	0.5882	120	120
7	A	G_C1_L21	7307.53	204.996	0.7858	121	121
8	A	G_C1_L0	5211.6	146.199	0.5604	122	122
8	A	G_C2_L21	8671.85	243.269	0.9325	123	123
8	A	G_C1_L21	6419.09	180.073	0.6902	124	124
9	A	G_C2_L21	7661.83	214.935	0.8239	125	125
9	A	G_C1_L0	6652.85	186.63	0.7154	126	126
10	A	G_C1_L21	3118.94	87.4946	0.3354	127	127
10	A	G_C2_L21	6064.81	170.134	0.6521	128	128
11	A	G_C1_L21	6276.27	176.066	0.6749	129	129
11	A	G_C0_L21	5462.65	153.242	0.5874	130	130
11	A	G_C2_L21	8783.55	246.402	0.9445	131	131
12	A	G_C0_L0	2912.93	81.7156	0.3132	132	132
12	A	G_C1_L21	5278.82	148.085	0.5676	133	133
13	A	G_C1_L21	4045.58	113.489	0.435	134	134
13	A	G_C2_L21	7186.17	201.591	0.7727	135	135
14	A	G_C2_L21	8490.28	238.175	0.9129	136	136
14	A	G_C0_L21	4875.02	136.757	0.5242	137	137
15	A	G_C0_L0	5186.35	145.491	0.5577	138	138
15	A	G_C2_L0	7557.54	212.009	0.8126	139	139
16	A	G_C1_L21	6682.12	187.451	0.7185	140	140
16	A	G_C1_L0	7456.85	209.185	0.8018	141	141
16	A	G_C0_L21	8059.49	226.09	0.8666	142	142
16	A	G_C0_L0	5924.24	166.191	0.637	143	143
17	A	G_C2_L0	6618.84	185.676	0.7117	144	144
17	A	G_C1_L0	8443.22	236.855	0.9079	145	145
17	A	G_C0_L0	8757.17	245.662	0.9416	146	146
17	A	G_C0_L21	7114.79	199.589	0.765	147	147
18	A	G_C1_L21	7922.13	222.237	0.8518	148	148
18	A	G_C0_L0	8500.32	238.457	0.914	149	149
18	A	G_C2_L21	4953.75	138.966	0.5327	150	150
18	A	G_C0_L21	5626.14	157.828	0.605	151	151
19	A	G_C0_L21	6273.65	175.993	0.6746	152	152
19	A	G_C1_L21	4275.82	119.948	0.4598	153	153
20	A	G_C1_L0	5900.58	165.527	0.6345	154	154
20	A	G_C1_L21	4358.45	122.266	0.4687	155	155
20	A	G_C0_L21	7867.86	220.715	0.846	156	156
20	A	G_C2_L21	6122.8	171.761	0.6584	157	157
21	A	G_C0_L21	5427.05	152.243	0.5836	158	158
21	A	G_C1_L21	9211.04	258.394	0.9904	159	159
21	A	G_C2_L0	5571.68	156.301	0.5991	160	160
21	A	G_C2_L21	6708.3	188.186	0.7213	161	161
22	A	G_C2_L0	7689.32	215.706	0.8268	162	162
22	A	G_C0_L0	1166.99	32.7371	0.1255	163	163
23	A	G_C1_L21	8403.31	235.735	0.9036	164	164
23	A	G_C1_L0	6184.79	173.5	0.665	165	165
23	A	G_C0_L21	7099.63	199.164	0.7634	166	166
24	A	G_C1_L0	9072.24	254.501	0.9755	167	167
24	A	G_C0_L21	8226.29	230.769	0.8845	168	168
24	A	G_C2_L0	9058.03	254.102	0.974	169	169
24	A	G_C2_L21	4279.54	120.053	0.4602	170	170
25	A	G_C1_L21	8653.61	242.757	0.9305	171	171
25	A	G_C0_L0	8572.91	240.493	0.9218	172	172
26	A	G_C2_L21	7971.32	223.617	0.8571	173	173
26	A	G_C1_L0	3577.63	100.362	0.3847	174	174
26	A	G_C1_L21	82.7208	2.3205	0.0089	175	175

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
27	A	G_C2_L0	4480.28	125.684	0.4818	176	176
27	A	G_C2_L21	2707.65	75.9568	0.2911	177	177
28	A	G_C1_L21	6066.35	170.177	0.6523	178	178
28	A	G_C1_L0	8262.12	231.775	0.8884	179	179
28	A	G_C0_L21	3525.98	98.9132	0.3791	180	180
29	A	G_C1_L0	7042.09	197.55	0.7572	181	181
29	A	G_C2_L21	7535.29	211.385	0.8102	182	182
29	A	G_C2_L0	4399.92	123.43	0.4731	183	183
29	A	G_C0_L21	8570.65	240.43	0.9216	184	184
30	A	G_C1_L0	7980.71	223.88	0.8581	185	185
30	A	G_C0_L21	8417.48	236.133	0.9051	186	186
30	A	G_C1_L21	4107.52	115.227	0.4417	187	187
31	A	G_C0_L0	7242.95	203.184	0.7788	188	188
31	A	G_C0_L21	6416.26	179.993	0.6899	189	189
31	A	G_C1_L0	7569.45	212.343	0.8139	190	190
32	A	G_C2_L21	5561.42	156.013	0.598	191	191
32	A	G_C0_L21	5628.27	157.888	0.6052	192	192
33	A	G_C2_L0	8552.96	239.934	0.9197	193	193
33	A	G_C0_L0	7038.5	197.449	0.7568	194	194
34	A	G_C1_L21	1655.8	46.4497	0.178	195	195
34	A	G_C2_L21	8181.35	229.509	0.8797	196	196
34	A	G_C0_L0	6661.17	186.864	0.7163	197	197
35	A	G_C2_L21	6415.94	179.984	0.6899	198	198
35	A	G_C2_L0	5847.03	164.025	0.6287	199	199
35	A	G_C0_L0	4917.82	137.958	0.5288	200	200
36	A	G_C0_L0	5664.9	158.916	0.6091	201	201
36	A	G_C2_L21	5769.98	161.863	0.6204	202	202
37	A	G_C1_L0	6936.53	194.588	0.7459	203	203
37	A	G_C1_L21	5744.9	161.16	0.6177	204	204
38	A	G_C1_L0	6085.38	170.711	0.6543	205	205
38	A	G_C0_L21	5980.04	167.756	0.643	206	206
38	A	G_C2_L0	6450.5	180.954	0.6936	207	207
39	A	G_C2_L21	6409.63	179.808	0.6892	208	208
39	A	G_C1_L21	8477.85	237.826	0.9116	209	209
40	A	G_C0_L0	7281.21	204.258	0.7829	210	210
40	A	G_C1_L21	6345.47	178.008	0.6823	211	211
40	A	G_C2_L0	6201.21	173.961	0.6668	212	212
40	A	G_C0_L21	8701.26	244.094	0.9356	213	213
41	A	G_C0_L21	7423.84	208.259	0.7983	214	214
41	A	G_C2_L0	4409.04	123.686	0.4741	215	215
42	A	G_C2_L21	6305.57	176.888	0.678	216	216
42	A	G_C1_L21	3079.71	86.3941	0.3312	217	217
42	A	G_C1_L0	6729.01	188.767	0.7235	218	218
42	A	G_C2_L0	4748.26	133.202	0.5106	219	219
43	A	G_C2_L21	1983.11	55.6316	0.2132	220	220
43	A	G_C0_L21	5132.14	143.97	0.5518	221	221
43	A	G_C2_L0	7307.42	204.993	0.7857	222	222
44	A	G_C2_L0	4624.33	129.725	0.4972	223	223
44	A	G_C0_L0	8664.6	243.065	0.9317	224	224
44	A	G_C1_L0	5139.85	144.187	0.5527	225	225
44	A	G_C2_L21	7341.96	205.962	0.7895	226	226
45	A	G_C2_L21	8916.74	250.139	0.9588	227	227
45	A	G_C1_L21	5346.4	149.981	0.5749	228	228
45	A	G_C2_L0	4395.91	123.317	0.4727	229	229
45	A	G_C1_L0	9133.49	256.219	0.9821	230	230
46	A	G_C0_L21	5770.38	161.875	0.6205	231	231
46	A	G_C2_L21	5733.62	160.843	0.6165	232	232
46	A	G_C2_L0	4874.42	136.741	0.5241	233	233
47	A	G_C2_L21	6421.99	180.154	0.6905	234	234
47	A	G_C1_L21	7140.12	200.3	0.7678	235	235
47	A	G_C0_L21	7062.89	198.133	0.7595	236	236
47	A	G_C2_L0	8022.37	225.049	0.8626	237	237
48	A	G_C2_L21	4075.75	114.336	0.4383	238	238
48	A	G_C0_L0	3264.14	91.568	0.351	239	239
48	A	G_C1_L21	7201.79	202.03	0.7744	240	240
48	A	G_C1_L0	9045.67	253.756	0.9727	241	241
49	A	G_C1_L21	4502.74	126.314	0.4842	242	242
49	A	G_C2_L0	4213.4	118.197	0.4531	243	243

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
49	A	G_C0_L21	7880.78	221.077	0.8474	244	244
49	A	G_C1_L0	3450.37	96.7923	0.371	245	245
50	A	G_C1_L21	8706.49	244.24	0.9362	246	246
50	A	G_C0_L0	6195.65	173.805	0.6662	247	247
50	A	G_C2_L21	8471.98	237.662	0.911	248	248
50	A	G_C0_L21	4340.35	121.759	0.4667	249	249
51	A	G_C1_L21	3295.66	92.4521	0.3544	250	250
51	A	G_C2_L21	8432.57	236.556	0.9067	251	251
51	A	G_C1_L0	6555.37	183.896	0.7049	252	252
52	A	G_C0_L21	7537.07	211.435	0.8104	253	253
52	A	G_C1_L0	8585.49	240.846	0.9232	254	254
52	A	G_C0_L0	7792.44	218.599	0.8379	255	255
52	A	G_C2_L21	4922.56	138.091	0.5293	256	256
53	A	G_C0_L0	6592.13	184.927	0.7088	257	257
53	A	G_C0_L21	7698.72	215.97	0.8278	258	258
54	A	G_C1_L0	5108.93	143.319	0.5493	259	259
54	A	G_C2_L0	1109.26	31.1177	0.1193	260	260
55	A	G_C0_L21	2515.18	70.5575	0.2704	261	261
55	A	G_C0_L0	6384.37	179.099	0.6865	262	262
55	A	G_C1_L0	9159.14	256.938	0.9849	263	263
56	A	G_C0_L21	7447.97	208.936	0.8009	264	264
56	A	G_C1_L0	4891.85	137.23	0.526	265	265
56	A	G_C0_L0	5588.54	156.774	0.6009	266	266
57	A	G_C2_L0	5533.55	155.231	0.595	267	267
57	A	G_C0_L21	7130.56	200.031	0.7667	268	268
58	A	G_C2_L21	7808.18	219.04	0.8396	269	269
58	A	G_C2_L0	6514.69	182.755	0.7005	270	270
59	A	G_C0_L21	7245.59	203.258	0.7791	271	271
59	A	G_C2_L21	8592	241.029	0.9239	272	272
59	A	G_C0_L0	7411.64	207.917	0.797	273	273
60	A	G_C1_L0	7877.78	220.993	0.8471	274	274
60	A	G_C2_L0	8781.65	246.349	0.9443	275	275
61	A	G_C0_L21	5649.48	158.483	0.6075	276	276
61	A	G_C2_L0	8121.79	227.838	0.8733	277	277
62	A	G_C1_L0	8123.51	227.886	0.8735	278	278
62	A	G_C2_L21	4867.28	136.54	0.5234	279	279
63	A	G_C0_L21	5349.11	150.057	0.5752	280	280
63	A	G_C2_L0	7999.28	224.401	0.8601	281	281
63	A	G_C2_L21	5738.57	160.982	0.6171	282	282
64	A	G_C0_L21	5688.26	159.571	0.6116	283	283
64	A	G_C1_L0	5913.91	165.901	0.6359	284	284
64	A	G_C0_L0	8807.73	247.081	0.9471	285	285
64	A	G_C2_L21	5248.91	147.246	0.5644	286	286
65	A	G_C0_L21	8990.76	252.215	0.9667	287	287
65	A	G_C2_L0	8458.31	237.278	0.9095	288	288
65	A	G_C1_L0	5899.27	165.49	0.6343	289	289
65	A	G_C0_L0	5730.63	160.76	0.6162	290	290
66	A	G_C2_L0	4571.11	128.232	0.4915	291	291
66	A	G_C2_L21	9228.58	258.887	0.9923	292	292
66	A	G_C1_L0	8502.26	238.511	0.9142	293	293
66	A	G_C0_L21	7727.94	216.789	0.831	294	294
67	A	G_C1_L0	7199.14	201.955	0.7741	295	295
67	A	G_C0_L0	6734.72	188.927	0.7242	296	296
67	A	G_C0_L21	1260.06	35.348	0.1355	297	297
68	A	G_C2_L0	8114.09	227.622	0.8725	298	298
68	A	G_C0_L21	8530.32	239.298	0.9172	299	299
68	A	G_C0_L0	7959.42	223.283	0.8559	300	300
69	A	G_C1_L0	8627.86	242.035	0.9277	301	301
69	A	G_C0_L0	6497.11	182.261	0.6986	302	302
69	A	G_C0_L21	5007.71	140.48	0.5385	303	303
69	A	G_C2_L0	8703.19	244.148	0.9358	304	304
70	A	G_C0_L21	4101.23	115.05	0.441	305	305
70	A	G_C0_L0	5184.16	145.43	0.5574	306	306
70	A	G_C2_L21	5668.37	159.013	0.6095	307	307
71	A	G_C2_L21	5737.76	160.96	0.617	308	308
71	A	G_C0_L21	6538.98	183.436	0.7031	309	309
71	A	G_C0_L0	7007.53	196.58	0.7535	310	310
72	A	G_C2_L21	5929.54	166.339	0.6376	311	311

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
72	A	G_C2_L0	5477.23	153.651	0.5889	312	312
72	A	G_C1_L0	8463.59	237.427	0.9101	313	313
72	A	G_C0_L21	7846.88	220.126	0.8438	314	314
73	A	G_C1_L0	7967.38	223.506	0.8567	315	315
73	A	G_C2_L0	4901.51	137.5	0.527	316	316
73	A	G_C2_L21	8103.87	227.335	0.8714	317	317
73	A	G_C1_L21	9298.93	260.86	0.9999	318	318
74	A	G_C0_L21	3538.15	99.2546	0.3804	319	319
74	A	G_C0_L0	8529.09	239.264	0.9171	320	320
74	A	G_C2_L0	4652.37	130.511	0.5003	321	321
74	A	G_C1_L21	4520.29	126.806	0.4861	322	322
75	A	G_C1_L21	8473.51	237.705	0.9111	323	323
75	A	G_C0_L0	5586.02	156.703	0.6006	324	324
75	A	G_C2_L0	8997.34	252.4	0.9675	325	325
75	A	G_C2_L21	7238.48	203.059	0.7783	326	326
76	A	G_C1_L0	4249.09	119.198	0.4569	327	327
76	A	G_C2_L0	6799.72	190.75	0.7312	328	328
77	A	G_C1_L21	7132.87	200.096	0.767	329	329
77	A	G_C0_L0	5970.64	167.493	0.642	330	330
77	A	G_C2_L0	6825.67	191.478	0.7339	331	331
78	A	G_C0_L21	9013.74	252.86	0.9692	332	332
78	A	G_C2_L21	6427.77	180.316	0.6912	333	333
78	A	G_C2_L0	7154.03	200.69	0.7693	334	334
79	A	G_C0_L21	5376.34	150.821	0.5781	335	335
79	A	G_C2_L0	7865.1	220.637	0.8457	336	336
79	A	G_C0_L0	2416.36	67.7853	0.2598	337	337
80	A	G_C1_L21	5648.1	158.445	0.6073	338	338
80	A	G_C0_L21	4739.6	132.958	0.5096	339	339
80	A	G_C0_L0	2620.52	73.5128	0.2818	340	340
80	A	G_C2_L0	6492.18	182.123	0.6981	341	341
81	A	G_C1_L21	6552.7	183.821	0.7046	342	342
81	A	G_C0_L0	5984.86	167.892	0.6435	343	343
82	A	G_C0_L21	8666.02	243.105	0.9318	344	344
82	A	G_C2_L0	7980.88	223.885	0.8582	345	345
82	A	G_C1_L0	4724.12	132.524	0.508	346	346
83	A	G_C0_L0	8230.24	230.881	0.885	347	347
83	A	G_C2_L21	8936.81	250.702	0.9609	348	348
83	A	G_C0_L21	8261.09	231.746	0.8883	349	349
84	A	G_C2_L21	6690.87	187.697	0.7194	350	350
84	A	G_C0_L21	3969.04	111.342	0.4268	351	351
85	A	G_C0_L0	6538.39	183.419	0.7031	352	352
85	A	G_C0_L21	7944.31	222.859	0.8542	353	353
86	A	G_C2_L0	7780.67	218.269	0.8366	354	354
86	A	G_C1_L0	6287.54	176.382	0.6761	355	355
87	A	G_C2_L21	9061.61	254.202	0.9744	356	356
87	A	G_C1_L21	1861.89	52.2311	0.2002	357	357
87	A	G_C1_L0	8953.28	251.163	0.9627	358	358
87	A	G_C0_L21	8322.31	233.463	0.8949	359	359
88	A	G_C0_L0	5102.86	143.149	0.5487	360	360
88	A	G_C1_L0	7683.9	215.554	0.8262	361	361
88	A	G_C2_L0	3645.65	102.27	0.392	362	362
89	A	G_C1_L0	7643.5	214.421	0.8219	363	363
89	A	G_C2_L0	8520.38	239.02	0.9162	364	364
90	A	G_C0_L0	9127.9	256.062	0.9815	365	365
90	A	G_C2_L21	3593.03	100.794	0.3863	366	366
91	A	G_C0_L0	4089.98	114.735	0.4398	367	367
91	A	G_C0_L21	7058.41	198.007	0.759	368	368
92	A	G_C0_L0	7264.52	203.789	0.7811	369	369
92	A	G_C0_L21	4240.79	118.966	0.456	370	370
93	A	G_C2_L21	2568.98	72.0668	0.2762	371	371
93	A	G_C1_L21	6574.99	184.446	0.707	372	372
93	A	G_C0_L21	826.998	23.1995	0.0889	373	373
94	A	G_C2_L0	4976.23	139.597	0.5351	374	374
94	A	G_C2_L21	6747.86	189.296	0.7256	375	375
95	A	G_C2_L21	6551.39	183.784	0.7045	376	376
95	A	G_C0_L21	7888.21	221.286	0.8482	377	377
95	A	G_C0_L0	8711.23	244.373	0.9367	378	378
96	A	G_C1_L0	4016.32	112.669	0.4319	379	379

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
96	A	G_C1_L21	2817.23	79.031	0.3029	380	380
97	A	G_C1_L0	5470.43	153.46	0.5882	381	381
97	A	G_C0_L21	2784.6	78.1154	0.2994	382	382
98	A	G_C1_L0	8290.76	232.578	0.8915	383	383
98	A	G_C2_L0	998.646	28.0147	0.1074	384	384
98	A	G_C2_L21	3119.19	87.5016	0.3354	385	385
99	A	G_C2_L0	7321.14	205.378	0.7872	386	386
99	A	G_C2_L21	2985.43	83.7493	0.321	387	387
99	A	G_C1_L0	7245.41	203.253	0.7791	388	388
99	A	G_C0_L0	5328.58	149.481	0.573	389	389
100	A	G_C1_L0	7754.34	217.53	0.8338	390	390
100	A	G_C1_L21	8126.86	227.98	0.8739	391	391
100	A	G_C0_L0	6993.74	196.193	0.752	392	392
100	A	G_C2_L0	5864.05	164.502	0.6305	393	393

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Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
1	B	G_C2_L1	4662.65	130.8	0.5014	101	101
1	B	G_C2_L0	9153.55	256.782	0.9843	102	102
1	B	G_C0_L0	7475.85	209.718	0.8039	103	103
1	B	G_C0_L1	8606.69	241.441	0.9255	104	104
1	B	G_C1_L0	3088.53	86.6416	0.3321	105	105
1	B	G_C1_L1	8634.26	242.214	0.9284	106	106
1	B	G_C2_L4	6434.95	180.518	0.6919	107	107
1	B	G_C2_L3	9080.77	254.74	0.9764	108	108
2	B	G_C0_L2	7633.23	214.133	0.8208	109	109
2	B	G_C0_L0	6079.34	170.542	0.6537	110	110
2	B	G_C1_L0	4348.63	121.991	0.4676	111	111
2	B	G_C1_L3	2729.58	76.5722	0.2935	112	112
2	B	G_C1_L1	7569.66	212.349	0.8139	113	113
2	B	G_C1_L4	1019.7	28.6054	0.1096	114	114
3	B	G_C2_L1	8179.04	229.444	0.8795	115	115
3	B	G_C1_L3	8009.51	224.688	0.8612	116	116
3	B	G_C2_L3	6168.79	173.051	0.6633	117	117
3	B	G_C2_L0	5256.49	147.459	0.5652	118	118
3	B	G_C0_L2	4933.28	138.392	0.5305	119	119
3	B	G_C2_L2	7439.1	208.687	0.7999	120	120
3	B	G_C1_L2	5445.13	152.75	0.5855	121	121
4	B	G_C1_L3	2578.59	72.3363	0.2773	122	122
4	B	G_C2_L2	4562.18	127.981	0.4906	123	123
4	B	G_C1_L0	7005.38	196.52	0.7533	124	124
4	B	G_C0_L4	6667.79	187.049	0.717	125	125
4	B	G_C0_L3	7806.45	218.992	0.8394	126	126
5	B	G_C0_L2	3658.3	102.625	0.3934	127	127
5	B	G_C1_L1	6947.02	194.883	0.747	128	128
5	B	G_C1_L4	8317.47	233.327	0.8944	129	129
5	B	G_C0_L1	5407.64	151.699	0.5815	130	130
5	B	G_C0_L3	8430.76	236.505	0.9065	131	131
6	B	G_C0_L0	7569.88	212.356	0.814	132	132
6	B	G_C2_L1	3171.08	88.9572	0.341	133	133
6	B	G_C0_L4	2784.23	78.1052	0.2994	134	134
6	B	G_C2_L4	7564.01	212.191	0.8133	135	135
6	B	G_C1_L4	3695.13	103.658	0.3973	136	136
6	B	G_C1_L3	3781.68	106.086	0.4066	137	137
6	B	G_C2_L3	7600.1	213.203	0.8172	138	138
7	B	G_C2_L1	8728.61	244.861	0.9386	139	139
7	B	G_C2_L4	2454.84	68.8648	0.264	140	140
7	B	G_C0_L3	9264.19	259.885	0.9961	141	141
7	B	G_C0_L2	6685.06	187.534	0.7188	142	142
7	B	G_C2_L2	5857.44	164.317	0.6298	143	143
7	B	G_C1_L3	7998.43	224.377	0.86	144	144
7	B	G_C2_L0	5065.18	142.092	0.5446	145	145
7	B	G_C2_L3	9084.95	254.857	0.9769	146	146
8	B	G_C2_L0	7521.32	210.993	0.8087	147	147

Iteration_I	Hazard_Zo	Component	Applied_EX	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	_ID	MPa	_mm	r_D	T_ID	L_ID
8	B	G_C2_L3	4976.32	139.599	0.5351	148	148
8	B	G_C0_L2	7730.72	216.867	0.8313	149	149
8	B	G_C1_L4	9141.53	256.444	0.983	150	150
8	B	G_C2_L4	7658.94	214.854	0.8235	151	151
8	B	G_C2_L1	8279.17	232.253	0.8902	152	152
8	B	G_C1_L3	5442.74	152.684	0.5852	153	153
8	B	G_C1_L1	4165.39	116.85	0.4479	154	154
8	B	G_C2_L2	8337.35	233.885	0.8965	155	155
9	B	G_C0_L1	8124.2	227.906	0.8736	156	156
9	B	G_C0_L2	5881.13	164.982	0.6324	157	157
9	B	G_C2_L1	7366.08	206.638	0.7921	158	158
9	B	G_C1_L2	5696.82	159.811	0.6126	159	159
9	B	G_C1_L0	8271.64	232.042	0.8894	160	160
10	B	G_C0_L1	9013.03	252.84	0.9691	161	161
10	B	G_C0_L0	8591.43	241.013	0.9238	162	162
10	B	G_C0_L4	5899.35	165.493	0.6343	163	163
10	B	G_C2_L2	5885.5	165.104	0.6328	164	164
10	B	G_C2_L1	4516.1	126.689	0.4856	165	165
10	B	G_C1_L4	7986.49	224.043	0.8588	166	166
10	B	G_C1_L0	8387.93	235.304	0.9019	167	167
11	B	G_C1_L4	4646.18	130.338	0.4996	168	168
11	B	G_C2_L3	8485.81	238.05	0.9125	169	169
11	B	G_C2_L2	7303.05	204.87	0.7853	170	170
11	B	G_C2_L4	5481.73	153.777	0.5894	171	171
11	B	G_C0_L2	7538.99	211.489	0.8106	172	172
11	B	G_C0_L0	7583.38	212.734	0.8154	173	173
11	B	G_C2_L0	8838.9	247.955	0.9504	174	174
12	B	G_C0_L4	9170.97	257.271	0.9861	175	175
12	B	G_C0_L1	2222.23	62.3394	0.2389	176	176
12	B	G_C0_L0	4825.77	135.376	0.5189	177	177
12	B	G_C1_L0	7920.37	222.188	0.8517	178	178
12	B	G_C1_L3	7413.81	207.977	0.7972	179	179
12	B	G_C2_L3	6809.94	191.037	0.7323	180	180
12	B	G_C2_L4	7661.85	214.935	0.8239	181	181
13	B	G_C0_L3	8988.34	252.147	0.9665	182	182
13	B	G_C2_L4	7156.81	200.768	0.7695	183	183
13	B	G_C0_L4	7246.65	203.288	0.7792	184	184
13	B	G_C1_L3	7550.15	211.802	0.8118	185	185
13	B	G_C2_L2	8924.18	250.347	0.9596	186	186
13	B	G_C0_L1	8113.32	227.6	0.8724	187	187
13	B	G_C1_L0	6590.94	184.894	0.7087	188	188
13	B	G_C1_L2	8547.68	239.785	0.9191	189	189
14	B	G_C0_L3	5590.25	156.822	0.6011	190	190
14	B	G_C1_L4	7530.58	211.253	0.8097	191	191
14	B	G_C1_L2	5820.91	163.292	0.6259	192	192
14	B	G_C0_L0	2914.46	81.7585	0.3134	193	193
14	B	G_C2_L0	8787.97	246.526	0.9449	194	194
14	B	G_C0_L1	9183.65	257.626	0.9875	195	195
15	B	G_C0_L3	8372.45	234.87	0.9003	196	196
15	B	G_C1_L2	6881.32	193.04	0.7399	197	197
15	B	G_C1_L0	8359.95	234.519	0.8989	198	198
15	B	G_C0_L0	7857.45	220.423	0.8449	199	199
15	B	G_C1_L1	8232.87	230.954	0.8853	200	200
15	B	G_C2_L3	6878.95	192.973	0.7397	201	201
15	B	G_C1_L4	7106.25	199.349	0.7641	202	202
16	B	G_C2_L0	9274.16	260.165	0.9972	203	203
16	B	G_C1_L3	4424.98	124.132	0.4758	204	204
16	B	G_C2_L2	8678.97	243.468	0.9332	205	205
16	B	G_C0_L0	6970.86	195.551	0.7496	206	206
16	B	G_C0_L3	2701.56	75.786	0.2905	207	207
16	B	G_C0_L1	5065.59	142.103	0.5447	208	208
16	B	G_C1_L0	4916.77	137.929	0.5287	209	209
17	B	G_C2_L1	8532.13	239.349	0.9174	210	210
17	B	G_C0_L2	6805.52	190.913	0.7318	211	211
17	B	G_C1_L1	2143.51	60.1313	0.2305	212	212
17	B	G_C0_L0	6318.09	177.239	0.6794	213	213
17	B	G_C1_L3	5955.62	167.071	0.6404	214	214
17	B	G_C1_L4	8887.5	249.318	0.9556	215	215

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
18	B	G_C2_L1	7513.36	210.77	0.8079	216	216
18	B	G_C1_L0	8196.45	229.932	0.8813	217	217
18	B	G_C1_L2	8013.74	224.807	0.8617	218	218
18	B	G_C2_L4	1261.7	35.394	0.1357	219	219
18	B	G_C0_L1	3092.71	86.7588	0.3325	220	220
18	B	G_C0_L3	7169.7	201.129	0.7709	221	221
18	B	G_C0_L4	5629.82	157.932	0.6054	222	222
19	B	G_C1_L3	5957.09	167.112	0.6405	223	223
19	B	G_C1_L0	5382.31	150.988	0.5787	224	224
19	B	G_C2_L0	9110.7	255.58	0.9796	225	225
19	B	G_C1_L1	5481.33	153.766	0.5894	226	226
19	B	G_C0_L2	5390.35	151.214	0.5796	227	227
19	B	G_C2_L4	7385.77	207.191	0.7942	228	228
20	B	G_C2_L0	5850.1	164.111	0.629	229	229
20	B	G_C1_L0	2010.69	56.4053	0.2162	230	230
20	B	G_C0_L1	7688.87	215.694	0.8268	231	231
20	B	G_C2_L3	7067.54	198.263	0.76	232	232
20	B	G_C1_L2	7645.96	214.49	0.8221	233	233
20	B	G_C2_L4	7447.11	208.912	0.8008	234	234
20	B	G_C0_L2	8265.79	231.878	0.8888	235	235
21	B	G_C1_L3	9193.22	257.895	0.9885	236	236
21	B	G_C1_L1	6952.99	195.05	0.7476	237	237
21	B	G_C1_L0	2468.12	69.2373	0.2654	238	238
21	B	G_C0_L1	4198.7	117.785	0.4515	239	239
21	B	G_C2_L3	5668.05	159.004	0.6095	240	240
21	B	G_C0_L0	7381.41	207.068	0.7937	241	241
21	B	G_C0_L3	5503.32	154.383	0.5918	242	242
22	B	G_C0_L3	8922.73	250.307	0.9594	243	243
22	B	G_C0_L4	6740.04	189.076	0.7247	244	244
22	B	G_C1_L0	9229.94	258.925	0.9925	245	245
22	B	G_C1_L4	1937.48	54.3515	0.2083	246	246
22	B	G_C2_L1	5084.83	142.643	0.5468	247	247
22	B	G_C1_L2	5606.44	157.276	0.6028	248	248
22	B	G_C2_L2	8446.58	236.949	0.9082	249	249
22	B	G_C2_L4	8305.41	232.989	0.8931	250	250
23	B	G_C1_L0	7136.11	200.187	0.7673	251	251
23	B	G_C0_L0	3392.51	95.1691	0.3648	252	252
23	B	G_C2_L4	5040.61	141.403	0.542	253	253
23	B	G_C1_L2	7100.23	199.18	0.7635	254	254
23	B	G_C0_L2	7291.61	204.549	0.784	255	255
23	B	G_C2_L0	8334.14	233.795	0.8961	256	256
23	B	G_C2_L3	7717.82	216.506	0.8299	257	257
23	B	G_C2_L1	7361.08	206.498	0.7915	258	258
23	B	G_C1_L4	6483.43	181.878	0.6971	259	259
24	B	G_C2_L4	8571.75	240.46	0.9217	260	260
24	B	G_C1_L1	3626.97	101.746	0.39	261	261
24	B	G_C1_L2	6884.56	193.13	0.7403	262	262
24	B	G_C0_L3	6967.4	195.454	0.7492	263	263
24	B	G_C2_L2	5826.75	163.456	0.6265	264	264
24	B	G_C0_L1	7437.12	208.631	0.7997	265	265
24	B	G_C2_L3	5913.56	165.891	0.6359	266	266
25	B	G_C1_L0	4363.26	122.401	0.4692	267	267
25	B	G_C1_L1	8620.08	241.816	0.9269	268	268
25	B	G_C2_L3	6862.03	192.498	0.7379	269	269
25	B	G_C2_L1	6890.17	193.288	0.7409	270	270
25	B	G_C0_L4	4980.3	139.711	0.5355	271	271
25	B	G_C0_L3	2948.6	82.716	0.3171	272	272
25	B	G_C2_L2	9114.96	255.699	0.9801	273	273
25	B	G_C1_L2	4736.53	132.872	0.5093	274	274
26	B	G_C0_L4	4877.9	136.838	0.5245	275	275
26	B	G_C1_L3	8157.55	228.841	0.8772	276	276
26	B	G_C1_L2	8970.99	251.66	0.9646	277	277
26	B	G_C2_L4	8460.76	237.347	0.9098	278	278
26	B	G_C0_L2	6818.52	191.278	0.7332	279	279
26	B	G_C2_L3	7956.36	223.197	0.8555	280	280
26	B	G_C1_L4	2386.05	66.9351	0.2566	281	281
27	B	G_C1_L2	3743.36	105.011	0.4025	282	282
27	B	G_C1_L4	4190.47	117.554	0.4506	283	283

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
27	B	G_C2_L4	5768.02	161.808	0.6202	284	284
27	B	G_C0_L0	4465.82	125.278	0.4802	285	285
27	B	G_C2_L3	3286.92	92.2068	0.3534	286	286
28	B	G_C1_L4	6705.3	188.102	0.721	287	287
28	B	G_C1_L2	6459.27	181.2	0.6945	288	288
28	B	G_C0_L2	4989.76	139.976	0.5365	289	289
28	B	G_C2_L2	8580.32	240.701	0.9226	290	290
28	B	G_C2_L4	4227.87	118.603	0.4546	291	291
28	B	G_C1_L0	9132	256.177	0.9819	292	292
28	B	G_C0_L3	4382.44	122.939	0.4712	293	293
28	B	G_C0_L0	5715.2	160.327	0.6145	294	294
28	B	G_C2_L3	2261.69	63.4464	0.2432	295	295
29	B	G_C0_L3	7650.46	214.616	0.8226	296	296
29	B	G_C1_L0	2461.65	69.0559	0.2647	297	297
29	B	G_C0_L1	6374.53	178.823	0.6854	298	298
29	B	G_C2_L2	4453.28	124.927	0.4788	299	299
29	B	G_C2_L3	2014.78	56.5199	0.2166	300	300
29	B	G_C1_L3	5338.7	149.765	0.5741	301	301
29	B	G_C2_L4	4704.26	131.967	0.5058	302	302
29	B	G_C2_L1	6671.17	187.144	0.7173	303	303
30	B	G_C0_L0	6419.6	180.087	0.6903	304	304
30	B	G_C2_L2	3876.66	108.751	0.4168	305	305
30	B	G_C1_L0	5305.77	148.841	0.5705	306	306
30	B	G_C0_L3	8187.26	229.675	0.8804	307	307
30	B	G_C0_L2	6643.34	186.363	0.7143	308	308
30	B	G_C0_L1	4482.35	125.742	0.482	309	309
30	B	G_C2_L0	7216.73	202.449	0.776	310	310
30	B	G_C0_L4	8927.7	250.446	0.96	311	311
30	B	G_C2_L4	5248.36	147.231	0.5643	312	312
31	B	G_C2_L0	6203.06	174.013	0.667	313	313
31	B	G_C0_L3	6722.25	188.577	0.7228	314	314
31	B	G_C2_L3	7013.85	196.757	0.7542	315	315
31	B	G_C2_L2	8613.82	241.641	0.9262	316	316
31	B	G_C1_L2	6586.37	184.765	0.7082	317	317
31	B	G_C1_L0	8378.76	235.047	0.9009	318	318
31	B	G_C1_L4	3428.03	96.1655	0.3686	319	319
32	B	G_C1_L3	4824.05	135.328	0.5187	320	320
32	B	G_C1_L2	8843.66	248.088	0.9509	321	321
32	B	G_C2_L0	2261.22	63.4333	0.2431	322	322
32	B	G_C0_L2	5667.98	159.002	0.6095	323	323
32	B	G_C0_L4	8648.53	242.614	0.9299	324	324
32	B	G_C2_L2	8870.3	248.836	0.9538	325	325
32	B	G_C0_L3	7495.15	210.259	0.8059	326	326
33	B	G_C1_L0	4146	116.306	0.4458	327	327
33	B	G_C0_L1	3677.49	103.164	0.3954	328	328
33	B	G_C0_L2	3196.88	89.681	0.3438	329	329
33	B	G_C0_L4	5721.03	160.49	0.6152	330	330
33	B	G_C0_L3	6439.13	180.635	0.6924	331	331
33	B	G_C1_L3	3792.54	106.391	0.4078	332	332
34	B	G_C2_L2	6999.85	196.364	0.7527	333	333
34	B	G_C0_L1	8832.71	247.781	0.9498	334	334
34	B	G_C0_L4	8141.66	228.395	0.8754	335	335
34	B	G_C1_L0	6502.17	182.403	0.6992	336	336
34	B	G_C1_L1	7449.53	208.979	0.801	337	337
34	B	G_C2_L3	8710.58	244.355	0.9366	338	338
35	B	G_C2_L1	9264.55	259.896	0.9962	339	339
35	B	G_C0_L0	5859.33	164.37	0.63	340	340
35	B	G_C1_L0	6372.49	178.766	0.6852	341	341
35	B	G_C2_L3	7811.8	219.142	0.84	342	342
35	B	G_C1_L3	8821.48	247.466	0.9485	343	343
36	B	G_C0_L4	5540.15	155.416	0.5957	344	344
36	B	G_C1_L1	7530.29	211.245	0.8097	345	345
36	B	G_C2_L2	6940.5	194.7	0.7463	346	346
36	B	G_C1_L2	3557.37	99.7938	0.3825	347	347
36	B	G_C2_L0	7004.35	196.491	0.7532	348	348
36	B	G_C0_L3	6684.36	187.514	0.7187	349	349
36	B	G_C0_L0	8932.45	250.579	0.9605	350	350
36	B	G_C1_L3	1642.91	46.088	0.1767	351	351

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
36	B	G_C0_L2	6924.88	194.261	0.7446	352	352
37	B	G_C2_L4	4256.79	119.414	0.4577	353	353
37	B	G_C0_L3	6786.95	190.392	0.7298	354	354
37	B	G_C2_L1	6919.22	194.103	0.744	355	355
37	B	G_C1_L1	2860.64	80.2486	0.3076	356	356
37	B	G_C2_L2	1891.75	53.0688	0.2034	357	357
37	B	G_C0_L2	5340.69	149.821	0.5743	358	358
37	B	G_C0_L1	6288.38	176.406	0.6762	359	359
37	B	G_C2_L3	7617.85	213.701	0.8191	360	360
37	B	G_C0_L4	8687.64	243.712	0.9342	361	361
38	B	G_C2_L1	2642.81	74.1379	0.2842	362	362
38	B	G_C2_L0	8258.96	231.686	0.8881	363	363
38	B	G_C0_L4	5545.14	155.556	0.5963	364	364
38	B	G_C2_L4	7470.11	209.557	0.8032	365	365
38	B	G_C0_L3	4105.03	115.157	0.4414	366	366
38	B	G_C2_L3	8370.33	234.81	0.9	367	367
38	B	G_C0_L2	7780.86	218.274	0.8367	368	368
39	B	G_C1_L4	4252.79	119.302	0.4573	369	369
39	B	G_C2_L2	8422.28	236.268	0.9056	370	370
39	B	G_C0_L0	6398.26	179.488	0.688	371	371
39	B	G_C0_L1	3776.51	105.941	0.4061	372	372
39	B	G_C1_L3	4306.51	120.809	0.4631	373	373
39	B	G_C1_L1	7870.54	220.79	0.8463	374	374
39	B	G_C2_L4	7382.04	207.086	0.7938	375	375
39	B	G_C2_L1	7381.47	207.07	0.7937	376	376
39	B	G_C0_L4	7468.63	209.515	0.8031	377	377
40	B	G_C2_L3	6266.05	175.779	0.6738	378	378
40	B	G_C1_L4	4920.53	138.034	0.5291	379	379
40	B	G_C2_L1	8592.35	241.039	0.9239	380	380
40	B	G_C1_L0	7790.81	218.553	0.8377	381	381
40	B	G_C0_L4	5895.29	165.379	0.6339	382	382
40	B	G_C2_L4	8135.25	228.216	0.8748	383	383
40	B	G_C2_L2	6527.79	183.122	0.7019	384	384
40	B	G_C1_L1	8470.02	237.607	0.9108	385	385
41	B	G_C1_L0	6266.45	175.791	0.6738	386	386
41	B	G_C1_L2	8332.56	233.751	0.896	387	387
41	B	G_C2_L3	2882.25	80.855	0.3099	388	388
41	B	G_C1_L3	9285.72	260.49	0.9985	389	389
41	B	G_C1_L1	6729.49	188.78	0.7236	390	390
41	B	G_C0_L2	8105.64	227.385	0.8716	391	391
41	B	G_C2_L2	8245.65	231.313	0.8866	392	392
41	B	G_C0_L3	5516.92	154.764	0.5932	393	393
42	B	G_C2_L3	3483.77	97.7291	0.3746	394	394
42	B	G_C0_L3	9056.02	254.046	0.9738	395	395
42	B	G_C0_L1	5965.31	167.343	0.6414	396	396
42	B	G_C1_L4	8766.85	245.934	0.9427	397	397
42	B	G_C1_L0	8220.65	230.611	0.8839	398	398
42	B	G_C0_L0	3967.21	111.291	0.4266	399	399
42	B	G_C2_L2	6925.72	194.285	0.7447	400	400
42	B	G_C2_L1	8772.76	246.1	0.9433	401	401
42	B	G_C1_L3	6169.19	173.062	0.6634	402	402
43	B	G_C0_L1	5497	154.206	0.5911	403	403
43	B	G_C2_L4	7716.16	216.459	0.8297	404	404
43	B	G_C1_L3	4875.52	136.772	0.5242	405	405
43	B	G_C2_L2	6692.66	187.747	0.7196	406	406
43	B	G_C1_L1	5574.95	156.392	0.5995	407	407
43	B	G_C0_L4	4474.65	125.526	0.4811	408	408
44	B	G_C2_L2	8932.55	250.582	0.9605	409	409
44	B	G_C1_L1	5963.04	167.279	0.6412	410	410
44	B	G_C0_L1	6532.07	183.242	0.7024	411	411
44	B	G_C0_L2	6607.37	185.354	0.7105	412	412
44	B	G_C2_L1	8712.02	244.395	0.9368	413	413
44	B	G_C0_L0	3689.39	103.497	0.3967	414	414
44	B	G_C2_L0	2710.79	76.0449	0.2915	415	415
44	B	G_C1_L2	7634.98	214.182	0.821	416	416
45	B	G_C2_L2	9263.68	259.871	0.9961	417	417
45	B	G_C2_L1	7520.65	210.975	0.8087	418	418
45	B	G_C0_L0	3805.53	106.755	0.4092	419	419

Iteration_I	Hazard_Zo	Component	Applied_EX	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	ID	MPa	_mm	r_D	T_ID	L_ID
45	B	G_C0_L4	6675.96	187.279	0.7178	420	420
45	B	G_C0_L3	6823.18	191.409	0.7337	421	421
45	B	G_C2_L3	4791.38	134.411	0.5152	422	422
45	B	G_C0_L1	8678.93	243.467	0.9332	423	423
45	B	G_C1_L3	9226.98	258.842	0.9921	424	424
45	B	G_C2_L4	4611.89	129.376	0.4959	425	425
46	B	G_C0_L1	3712.02	104.132	0.3991	426	426
46	B	G_C2_L0	7639.43	214.306	0.8214	427	427
46	B	G_C2_L1	5798.42	162.661	0.6235	428	428
46	B	G_C2_L4	3568.98	100.12	0.3838	429	429
46	B	G_C2_L3	8351.72	234.288	0.898	430	430
46	B	G_C0_L2	7272.27	204.007	0.782	431	431
46	B	G_C1_L3	8963.34	251.446	0.9638	432	432
46	B	G_C1_L2	5739.13	160.998	0.6171	433	433
47	B	G_C0_L2	7551.98	211.853	0.812	434	434
47	B	G_C2_L0	5743.14	161.11	0.6175	435	435
47	B	G_C2_L3	7082.18	198.674	0.7615	436	436
47	B	G_C1_L1	6982.76	195.885	0.7508	437	437
47	B	G_C1_L2	5929.82	166.347	0.6376	438	438
47	B	G_C1_L3	4475.15	125.54	0.4812	439	439
48	B	G_C0_L4	7430.14	208.435	0.7989	440	440
48	B	G_C2_L1	8105.7	227.387	0.8716	441	441
48	B	G_C1_L0	3144.73	88.2181	0.3381	442	442
48	B	G_C0_L1	8115.62	227.665	0.8726	443	443
48	B	G_C2_L2	7511.17	210.708	0.8077	444	444
49	B	G_C2_L1	6358.04	178.36	0.6837	445	445
49	B	G_C0_L2	5421.87	152.098	0.583	446	446
49	B	G_C1_L0	3993.24	112.021	0.4294	447	447
49	B	G_C2_L2	7638.15	214.271	0.8213	448	448
49	B	G_C1_L3	4956.7	139.049	0.533	449	449
49	B	G_C0_L4	5656.37	158.676	0.6082	450	450
49	B	G_C0_L0	6465.03	181.361	0.6952	451	451
49	B	G_C2_L4	6171.15	173.117	0.6636	452	452
50	B	G_C0_L3	8570.58	240.428	0.9216	453	453
50	B	G_C0_L0	8967.51	251.563	0.9642	454	454
50	B	G_C2_L1	4790.9	134.398	0.5152	455	455
50	B	G_C1_L2	4513.07	126.604	0.4853	456	456
50	B	G_C1_L0	7070.14	198.336	0.7602	457	457
50	B	G_C0_L2	8009.43	224.686	0.8612	458	458
51	B	G_C2_L0	4447.44	124.763	0.4782	459	459
51	B	G_C1_L3	7315.61	205.222	0.7866	460	460
51	B	G_C1_L1	4671.72	131.054	0.5023	461	461
51	B	G_C0_L0	7363.42	206.564	0.7918	462	462
51	B	G_C1_L2	4651.08	130.475	0.5001	463	463
51	B	G_C2_L3	2180.7	61.1744	0.2345	464	464
52	B	G_C1_L3	9039.18	253.573	0.972	465	465
52	B	G_C0_L2	8264.03	231.828	0.8886	466	466
52	B	G_C0_L0	4529.71	127.071	0.4871	467	467
52	B	G_C0_L1	3542.07	99.3647	0.3809	468	468
52	B	G_C1_L2	8647.86	242.596	0.9299	469	469
52	B	G_C0_L4	7202.37	202.046	0.7744	470	470
53	B	G_C1_L1	8578.83	240.659	0.9225	471	471
53	B	G_C0_L0	8245.88	231.319	0.8867	472	472
53	B	G_C2_L3	7839.02	219.906	0.8429	473	473
53	B	G_C1_L2	9260.22	259.774	0.9957	474	474
53	B	G_C2_L1	6344.73	177.987	0.6822	475	475
53	B	G_C1_L4	6592.61	184.94	0.7089	476	476
53	B	G_C0_L2	9039.57	253.584	0.972	477	477
53	B	G_C2_L0	7181.47	201.459	0.7722	478	478
53	B	G_C2_L2	3850.68	108.022	0.4141	479	479
54	B	G_C2_L3	7290.11	204.507	0.7839	480	480
54	B	G_C1_L3	4393.05	123.237	0.4724	481	481
54	B	G_C1_L1	5924.05	166.185	0.637	482	482
54	B	G_C0_L2	3851.73	108.051	0.4142	483	483
54	B	G_C2_L0	5575.26	156.401	0.5995	484	484
54	B	G_C2_L1	8991.37	252.232	0.9668	485	485
55	B	G_C2_L0	1958.11	54.9302	0.2105	486	486
55	B	G_C1_L2	4652.83	130.524	0.5003	487	487

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
55	B	G_C0_L4	7109.34	199.436	0.7644	488	488
55	B	G_C2_L2	2290.71	64.2606	0.2463	489	489
55	B	G_C2_L3	5188.9	145.562	0.5579	490	490
55	B	G_C0_L1	4172.24	117.043	0.4486	491	491
55	B	G_C0_L0	7587.67	212.855	0.8159	492	492
55	B	G_C0_L3	7977.72	223.797	0.8578	493	493
56	B	G_C0_L0	4119.49	115.563	0.443	494	494
56	B	G_C1_L2	5637.57	158.149	0.6062	495	495
56	B	G_C1_L1	3076.75	86.3112	0.3308	496	496
56	B	G_C0_L3	5415.19	151.911	0.5823	497	497
56	B	G_C0_L2	7565.48	212.232	0.8135	498	498
56	B	G_C1_L3	7770.5	217.983	0.8355	499	499
57	B	G_C1_L3	8222.02	230.65	0.8841	500	500
57	B	G_C0_L4	7815.54	219.247	0.8404	501	501
57	B	G_C1_L2	6324.98	177.433	0.6801	502	502
57	B	G_C1_L1	2213.87	62.1051	0.2381	503	503
57	B	G_C2_L1	6302.9	176.813	0.6777	504	504
57	B	G_C2_L3	7085	198.753	0.7618	505	505
57	B	G_C2_L0	8700.25	244.065	0.9355	506	506
57	B	G_C1_L4	8878.43	249.064	0.9547	507	507
57	B	G_C2_L4	6326.21	177.467	0.6802	508	508
58	B	G_C0_L3	5646.19	158.391	0.6071	509	509
58	B	G_C0_L4	2525.08	70.8354	0.2715	510	510
58	B	G_C0_L2	8398.87	235.611	0.9031	511	511
58	B	G_C1_L0	7677.12	215.364	0.8255	512	512
58	B	G_C2_L2	6333.02	177.658	0.681	513	513
59	B	G_C0_L3	4234.35	118.785	0.4553	514	514
59	B	G_C0_L2	844.29	23.6846	0.0908	515	515
59	B	G_C2_L3	8865.28	248.695	0.9533	516	516
59	B	G_C0_L4	7804.98	218.951	0.8392	517	517
59	B	G_C2_L0	8198.44	229.988	0.8816	518	518
59	B	G_C1_L3	4356.71	122.217	0.4685	519	519
59	B	G_C2_L4	3184.6	89.3367	0.3424	520	520
60	B	G_C0_L1	5012.39	140.611	0.539	521	521
60	B	G_C1_L1	8417.41	236.131	0.9051	522	522
60	B	G_C2_L2	7723.82	216.674	0.8305	523	523
60	B	G_C2_L0	8213.4	230.408	0.8832	524	524
60	B	G_C0_L4	7838.69	219.896	0.8429	525	525
60	B	G_C2_L4	8803.15	246.952	0.9466	526	526
60	B	G_C1_L2	7372.03	206.805	0.7927	527	527
61	B	G_C1_L3	8854.28	248.386	0.9521	528	528
61	B	G_C2_L4	7020.08	196.932	0.7548	529	529
61	B	G_C0_L1	9003.34	252.568	0.9681	530	530
61	B	G_C2_L2	6573.48	184.404	0.7068	531	531
61	B	G_C1_L4	6240.24	175.055	0.671	532	532
62	B	G_C2_L0	7005.42	196.521	0.7533	533	533
62	B	G_C2_L4	6247.05	175.247	0.6717	534	534
62	B	G_C1_L1	4798.33	134.606	0.5159	535	535
62	B	G_C0_L1	6505.22	182.489	0.6995	536	536
62	B	G_C0_L2	7347.71	206.123	0.7901	537	537
63	B	G_C2_L0	7004.84	196.505	0.7532	538	538
63	B	G_C0_L1	8164.98	229.05	0.878	539	539
63	B	G_C2_L3	7868.34	220.728	0.8461	540	540
63	B	G_C1_L3	6499.71	182.334	0.6989	541	541
63	B	G_C2_L1	4490.22	125.963	0.4828	542	542
63	B	G_C2_L2	5316.25	149.135	0.5716	543	543
63	B	G_C2_L4	6689.78	187.666	0.7193	544	544
63	B	G_C1_L4	8835.45	247.858	0.95	545	545
64	B	G_C2_L0	7142.37	200.363	0.768	546	546
64	B	G_C2_L1	8292.98	232.64	0.8917	547	547
64	B	G_C1_L2	8490.62	238.185	0.913	548	548
64	B	G_C1_L0	7570.49	212.373	0.814	549	549
64	B	G_C0_L2	8594.65	241.103	0.9242	550	550
64	B	G_C0_L0	7209.52	202.246	0.7752	551	551
65	B	G_C1_L2	7704.19	216.123	0.8284	552	552
65	B	G_C2_L3	9076.16	254.611	0.9759	553	553
65	B	G_C1_L1	7689.5	215.711	0.8268	554	554
65	B	G_C1_L4	8129.68	228.059	0.8742	555	555

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65	B	G_C2_L4	2720.36	76.3135	0.2925	556	556
65	B	G_C0_L4	6057.35	169.925	0.6513	557	557
65	B	G_C2_L2	7336.7	205.814	0.7889	558	558
66	B	G_C0_L2	5681.63	159.385	0.6109	559	559
66	B	G_C1_L2	7584.12	212.755	0.8155	560	560
66	B	G_C0_L3	7595.88	213.085	0.8168	561	561
66	B	G_C1_L3	4949.06	138.834	0.5322	562	562
66	B	G_C2_L1	8390.64	235.38	0.9022	563	563
66	B	G_C2_L2	5684.37	159.462	0.6112	564	564
66	B	G_C0_L4	2336.14	65.5351	0.2512	565	565
66	B	G_C1_L0	8636.44	242.275	0.9286	566	566
67	B	G_C2_L2	9287.44	260.538	0.9986	567	567
67	B	G_C1_L1	5456.78	153.077	0.5868	568	568
67	B	G_C0_L2	6001.49	168.358	0.6453	569	569
67	B	G_C1_L2	8506.15	238.62	0.9146	570	570
67	B	G_C1_L0	7410.94	207.897	0.7969	571	571
68	B	G_C0_L4	7036.1	197.381	0.7566	572	572
68	B	G_C0_L3	6170.71	173.105	0.6635	573	573
68	B	G_C2_L3	3090.12	86.6863	0.3323	574	574
68	B	G_C1_L1	3909.73	109.678	0.4204	575	575
68	B	G_C2_L2	9179.4	257.507	0.987	576	576
68	B	G_C1_L2	5488.54	153.968	0.5902	577	577
69	B	G_C1_L1	3121.95	87.579	0.3357	578	578
69	B	G_C1_L2	5178.85	145.281	0.5569	579	579
69	B	G_C0_L1	8686.36	243.676	0.934	580	580
69	B	G_C1_L0	7402.49	207.66	0.796	581	581
69	B	G_C0_L0	7301.51	204.827	0.7851	582	582
69	B	G_C2_L3	2774.99	77.8458	0.2984	583	583
69	B	G_C0_L3	2223.11	62.3643	0.239	584	584
70	B	G_C0_L2	6343.31	177.947	0.6821	585	585
70	B	G_C2_L3	6878.75	192.967	0.7397	586	586
70	B	G_C0_L1	9067.81	254.376	0.975	587	587
70	B	G_C1_L0	5980.47	167.768	0.6431	588	588
70	B	G_C2_L1	6099.79	171.115	0.6559	589	589
70	B	G_C2_L2	7437.68	208.647	0.7998	590	590
70	B	G_C1_L2	5410.73	151.786	0.5818	591	591
71	B	G_C1_L0	4690.36	131.577	0.5043	592	592
71	B	G_C2_L4	7796.35	218.709	0.8383	593	593
71	B	G_C0_L0	3847.01	107.919	0.4137	594	594
71	B	G_C0_L3	8321.03	233.427	0.8947	595	595
71	B	G_C2_L1	7274.23	204.062	0.7822	596	596
72	B	G_C2_L2	6556.78	183.935	0.705	597	597
72	B	G_C0_L3	6777.01	190.113	0.7287	598	598
72	B	G_C0_L2	8087.67	226.881	0.8696	599	599
72	B	G_C2_L4	5567.98	156.197	0.5987	600	600
72	B	G_C0_L0	8894.69	249.52	0.9564	601	601
72	B	G_C1_L3	6214.69	174.339	0.6682	602	602
72	B	G_C2_L3	4968.96	139.393	0.5343	603	603
72	B	G_C1_L4	8640.16	242.38	0.929	604	604
72	B	G_C0_L1	8632.61	242.168	0.9282	605	605
73	B	G_C2_L3	5855.86	164.273	0.6297	606	606
73	B	G_C2_L0	7709.34	216.268	0.829	607	607
73	B	G_C0_L4	6094.46	170.966	0.6553	608	608
73	B	G_C1_L4	8646.68	242.563	0.9298	609	609
73	B	G_C1_L2	5800.49	162.719	0.6237	610	610
73	B	G_C2_L1	7809.03	219.064	0.8397	611	611
73	B	G_C0_L1	7947.64	222.952	0.8546	612	612
73	B	G_C0_L3	7807.68	219.026	0.8395	613	613
73	B	G_C2_L2	4743.84	133.077	0.5101	614	614
74	B	G_C0_L4	8519.48	238.994	0.9161	615	615
74	B	G_C2_L4	8844.2	248.104	0.951	616	616
74	B	G_C1_L2	7632.52	214.113	0.8207	617	617
74	B	G_C0_L1	4114.06	115.41	0.4424	618	618
74	B	G_C1_L3	9262.33	259.833	0.9959	619	619
74	B	G_C2_L1	2641.57	74.1032	0.284	620	620
74	B	G_C2_L3	3379.3	94.7984	0.3634	621	621
74	B	G_C0_L3	6500.36	182.353	0.699	622	622
74	B	G_C2_L2	9265.53	259.923	0.9963	623	623

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
75	B	G_C0_L3	8126.44	227.969	0.8738	624	624
75	B	G_C2_L4	7585.38	212.79	0.8156	625	625
75	B	G_C2_L2	7980.93	223.887	0.8582	626	626
75	B	G_C0_L4	7162.88	200.938	0.7702	627	627
75	B	G_C2_L1	7144.78	200.43	0.7683	628	628
75	B	G_C0_L1	5174.14	145.149	0.5564	629	629
75	B	G_C1_L3	6250.22	175.336	0.6721	630	630
75	B	G_C1_L4	7732.68	216.923	0.8315	631	631
76	B	G_C1_L4	9165.46	257.116	0.9855	632	632
76	B	G_C2_L2	8957.5	251.282	0.9632	633	633
76	B	G_C2_L4	5984.91	167.893	0.6435	634	634
76	B	G_C0_L0	6821.2	191.353	0.7335	635	635
76	B	G_C0_L2	2211.8	62.047	0.2378	636	636
76	B	G_C2_L3	7309.91	205.063	0.786	637	637
76	B	G_C2_L1	6705.59	188.11	0.721	638	638
76	B	G_C1_L2	8569.3	240.392	0.9214	639	639
77	B	G_C1_L3	8390.87	235.386	0.9022	640	640
77	B	G_C2_L1	5162.53	144.823	0.5551	641	641
77	B	G_C0_L0	3206.09	89.9393	0.3447	642	642
77	B	G_C2_L3	1205.14	33.8073	0.1296	643	643
77	B	G_C2_L0	8966.97	251.548	0.9642	644	644
78	B	G_C1_L0	4297	120.543	0.462	645	645
78	B	G_C0_L4	6446.42	180.839	0.6932	646	646
78	B	G_C1_L1	6469.92	181.499	0.6957	647	647
78	B	G_C1_L3	9090.64	255.017	0.9775	648	648
78	B	G_C0_L0	8368.36	234.755	0.8998	649	649
78	B	G_C2_L3	7022.57	197.002	0.7551	650	650
78	B	G_C1_L2	6181.67	173.413	0.6647	651	651
78	B	G_C0_L3	5215.07	146.297	0.5608	652	652
79	B	G_C0_L3	7274.62	204.073	0.7822	653	653
79	B	G_C0_L1	6945.17	194.831	0.7468	654	654
79	B	G_C2_L1	7409.63	207.86	0.7967	655	655
79	B	G_C0_L2	7442.06	208.77	0.8002	656	656
79	B	G_C2_L2	4828.34	135.448	0.5192	657	657
79	B	G_C1_L0	8835.21	247.851	0.95	658	658
79	B	G_C0_L4	9211.26	258.401	0.9905	659	659
79	B	G_C2_L4	6979.02	195.78	0.7504	660	660
79	B	G_C2_L3	7164.57	200.986	0.7704	661	661
80	B	G_C1_L4	8552.11	239.91	0.9196	662	662
80	B	G_C2_L1	5111.42	143.389	0.5496	663	663
80	B	G_C1_L2	8323.31	233.491	0.895	664	664
80	B	G_C0_L1	6456.23	181.114	0.6942	665	665
80	B	G_C1_L3	3832.07	107.5	0.4121	666	666
81	B	G_C2_L0	6456.11	181.111	0.6942	667	667
81	B	G_C1_L1	3048.83	85.528	0.3278	668	668
81	B	G_C2_L2	8670.69	243.236	0.9323	669	669
81	B	G_C2_L1	5770.41	161.875	0.6205	670	670
81	B	G_C0_L2	8934.16	250.627	0.9607	671	671
82	B	G_C1_L3	4592.56	128.834	0.4938	672	672
82	B	G_C0_L3	2464.35	69.1316	0.265	673	673
82	B	G_C0_L0	2932.33	82.2598	0.3153	674	674
82	B	G_C0_L4	4946.42	138.76	0.5319	675	675
82	B	G_C0_L2	7214	202.372	0.7757	676	676
82	B	G_C1_L4	5925.06	166.214	0.6371	677	677
82	B	G_C1_L1	2968.52	83.2749	0.3192	678	678
82	B	G_C1_L0	5232.86	146.796	0.5627	679	679
82	B	G_C2_L0	5931.08	166.383	0.6378	680	680
83	B	G_C1_L3	7512.8	210.754	0.8078	681	681
83	B	G_C2_L0	6070.11	170.283	0.6527	682	682
83	B	G_C0_L3	3114.85	87.3798	0.3349	683	683
83	B	G_C2_L3	1797.3	50.4192	0.1933	684	684
83	B	G_C2_L4	7929.79	222.452	0.8527	685	685
84	B	G_C2_L1	8274.73	232.128	0.8898	686	686
84	B	G_C1_L3	8126.4	227.967	0.8738	687	687
84	B	G_C1_L2	5258.02	147.501	0.5654	688	688
84	B	G_C0_L0	4629.16	129.86	0.4978	689	689
84	B	G_C0_L2	8835.65	247.864	0.9501	690	690
84	B	G_C1_L4	7624.53	213.888	0.8198	691	691

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84	B	G_C1_L1	8129.4	228.051	0.8741	692	692
84	B	G_C0_L1	3902.11	109.465	0.4196	693	693
84	B	G_C0_L4	4074.47	114.3	0.4381	694	694
85	B	G_C0_L4	4225.48	118.536	0.4544	695	695
85	B	G_C2_L4	4047.65	113.548	0.4352	696	696
85	B	G_C2_L1	7253.11	203.469	0.7799	697	697
85	B	G_C0_L2	8297.98	232.78	0.8923	698	698
85	B	G_C1_L3	7100.04	199.175	0.7634	699	699
86	B	G_C2_L1	6428.62	180.34	0.6912	700	700
86	B	G_C0_L3	3975.39	111.52	0.4275	701	701
86	B	G_C1_L3	8704.36	244.181	0.936	702	702
86	B	G_C2_L0	7330.56	205.642	0.7882	703	703
86	B	G_C2_L2	8560.87	240.155	0.9205	704	704
86	B	G_C1_L0	6682	187.448	0.7185	705	705
86	B	G_C1_L1	9056.38	254.056	0.9738	706	706
86	B	G_C1_L4	7686.34	215.623	0.8265	707	707
87	B	G_C1_L4	93.8031	2.6314	0.0101	708	708
87	B	G_C2_L1	7729.97	216.846	0.8312	709	709
87	B	G_C2_L0	8880.63	249.126	0.9549	710	710
87	B	G_C0_L2	8495.45	238.32	0.9135	711	711
87	B	G_C0_L1	9169.55	257.231	0.986	712	712
87	B	G_C1_L0	8792.59	246.656	0.9454	713	713
87	B	G_C0_L3	7205.69	202.139	0.7748	714	714
88	B	G_C2_L4	6415.1	179.961	0.6898	715	715
88	B	G_C0_L1	8246.43	231.335	0.8867	716	716
88	B	G_C0_L3	6284.46	176.296	0.6757	717	717
88	B	G_C0_L0	5988.88	168.004	0.644	718	718
88	B	G_C0_L4	7480	209.834	0.8043	719	719
88	B	G_C1_L0	7135.42	200.168	0.7672	720	720
88	B	G_C1_L4	3732.88	104.717	0.4014	721	721
88	B	G_C0_L2	5167.87	144.973	0.5557	722	722
89	B	G_C1_L4	9132.36	256.187	0.982	723	723
89	B	G_C1_L3	7545.55	211.673	0.8113	724	724
89	B	G_C1_L1	5414.22	151.883	0.5822	725	725
89	B	G_C0_L1	3895.56	109.281	0.4189	726	726
89	B	G_C2_L0	6409.68	179.809	0.6892	727	727
89	B	G_C0_L3	8281.47	232.317	0.8905	728	728
89	B	G_C2_L4	5180.61	145.33	0.5571	729	729
89	B	G_C1_L2	7955.76	223.18	0.8555	730	730
89	B	G_C0_L2	8756.41	245.641	0.9415	731	731
90	B	G_C0_L3	7090.59	198.91	0.7624	732	732
90	B	G_C0_L0	4918.85	137.987	0.5289	733	733
90	B	G_C2_L0	6067.85	170.22	0.6525	734	734
90	B	G_C2_L4	3912.94	109.769	0.4207	735	735
90	B	G_C1_L4	7232.26	202.884	0.7777	736	736
91	B	G_C0_L4	7526.93	211.151	0.8093	737	737
91	B	G_C1_L1	9128.77	256.087	0.9816	738	738
91	B	G_C2_L3	8857.46	248.476	0.9524	739	739
91	B	G_C0_L2	2170.26	60.8816	0.2334	740	740
91	B	G_C2_L4	2979.4	83.5802	0.3204	741	741
91	B	G_C1_L4	7269.11	203.918	0.7816	742	742
91	B	G_C2_L0	9212.43	258.434	0.9906	743	743
91	B	G_C0_L1	7827.7	219.588	0.8417	744	744
91	B	G_C2_L1	8671.15	243.249	0.9324	745	745
92	B	G_C0_L1	4178.42	117.216	0.4493	746	746
92	B	G_C1_L3	7949.46	223.004	0.8548	747	747
92	B	G_C0_L3	7100	199.174	0.7634	748	748
92	B	G_C0_L0	8906.3	249.846	0.9577	749	749
92	B	G_C2_L4	4063.94	114.004	0.437	750	750
92	B	G_C0_L2	8567.45	240.34	0.9212	751	751
92	B	G_C1_L2	5133.32	144.003	0.552	752	752
92	B	G_C2_L3	7974.67	223.711	0.8575	753	753
92	B	G_C2_L0	6775.85	190.081	0.7286	754	754
93	B	G_C1_L4	5173.61	145.134	0.5563	755	755
93	B	G_C2_L0	4454.49	124.96	0.479	756	756
93	B	G_C0_L4	5473.46	153.545	0.5885	757	757
93	B	G_C0_L1	9239.79	259.201	0.9935	758	758
93	B	G_C0_L3	6345.63	178.012	0.6823	759	759

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
93	B	G_C2_L3	7592.46	212.989	0.8164	760	760
94	B	G_C0_L2	3434.44	96.3454	0.3693	761	761
94	B	G_C1_L1	1850.48	51.911	0.199	762	762
94	B	G_C1_L4	8523.01	239.094	0.9165	763	763
94	B	G_C1_L0	8274.87	232.132	0.8898	764	764
94	B	G_C1_L2	4931.92	138.353	0.5303	765	765
94	B	G_C0_L4	5648.81	158.464	0.6074	766	766
94	B	G_C0_L0	5371.73	150.691	0.5776	767	767
94	B	G_C2_L2	9025.38	253.186	0.9705	768	768
94	B	G_C2_L0	7214.39	202.383	0.7757	769	769
95	B	G_C0_L2	7817.88	219.312	0.8406	770	770
95	B	G_C0_L1	5303.21	148.769	0.5702	771	771
95	B	G_C2_L2	3803.46	106.697	0.409	772	772
95	B	G_C2_L0	6858.18	192.391	0.7374	773	773
95	B	G_C2_L4	6317.4	177.22	0.6793	774	774
96	B	G_C1_L2	5214.12	146.27	0.5607	775	775
96	B	G_C2_L2	8751.36	245.499	0.941	776	776
96	B	G_C1_L1	6493.82	182.169	0.6983	777	777
96	B	G_C2_L4	7575.27	212.507	0.8145	778	778
96	B	G_C1_L0	8809.15	247.12	0.9472	779	779
96	B	G_C0_L1	4333.56	121.568	0.466	780	780
97	B	G_C1_L3	6947.15	194.886	0.747	781	781
97	B	G_C0_L0	8339.41	233.943	0.8967	782	782
97	B	G_C0_L1	6877.8	192.941	0.7395	783	783
97	B	G_C1_L2	4637.58	130.097	0.4987	784	784
97	B	G_C1_L0	5476.18	153.622	0.5888	785	785
98	B	G_C1_L1	9260.59	259.785	0.9958	786	786
98	B	G_C2_L1	7967.29	223.504	0.8567	787	787
98	B	G_C0_L3	7239.13	203.077	0.7784	788	788
98	B	G_C1_L3	6225.74	174.649	0.6694	789	789
98	B	G_C0_L4	7175.32	201.287	0.7715	790	790
98	B	G_C0_L1	4489.6	125.945	0.4828	791	791
98	B	G_C2_L0	8838.22	247.936	0.9503	792	792
99	B	G_C1_L2	3332.27	93.4792	0.3583	793	793
99	B	G_C2_L3	8349.29	234.22	0.8978	794	794
99	B	G_C0_L4	8466.73	237.514	0.9104	795	795
99	B	G_C2_L2	4905.61	137.616	0.5275	796	796
99	B	G_C0_L0	7354.73	206.32	0.7908	797	797
99	B	G_C2_L4	9137.38	256.328	0.9825	798	798
100	B	G_C1_L4	8028.28	225.215	0.8633	799	799
100	B	G_C2_L1	5861.62	164.434	0.6303	800	800
100	B	G_C2_L0	4347.66	121.964	0.4675	801	801
100	B	G_C0_L2	8651.07	242.686	0.9302	802	802
100	B	G_C0_L0	5287	148.314	0.5685	803	803

C.3.27 stochastic_traceability_log_GS_C.csv

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
1	C	D_L_BOT	6421.18	180.131	0.6904	101	101
3	C	D_R_BOT	8299.25	232.816	0.8924	102	102
5	C	D_R_BOT	9078.12	254.666	0.9761	103	103
7	C	D_L_BOT	8513.06	238.814	0.9154	104	104
10	C	D_L_BOT	3339.22	93.674	0.3591	105	105
11	C	D_L_BOT	5932.52	166.423	0.6379	106	106
13	C	D_R_BOT	280.807	7.8774	0.0302	107	107
14	C	D_R_BOT	7285.11	204.367	0.7833	108	108
20	C	D_L_BOT	8705.39	244.21	0.9361	109	109
22	C	D_R_BOT	3794.06	106.434	0.408	110	110
24	C	D_R_BOT	5922.91	166.154	0.6369	111	111
25	C	D_L_BOT	6788.49	190.435	0.7299	112	112
32	C	D_L_BOT	7711.87	216.339	0.8292	113	113
33	C	D_L_BOT	7571.16	212.391	0.8141	114	114
35	C	D_R_BOT	7164.1	200.972	0.7703	115	115
36	C	D_R_BOT	7748.53	217.367	0.8332	116	116
37	C	D_R_BOT	4637.45	130.093	0.4987	117	117

Iteration_I	Hazard_Zo	Component	Applied_EX_	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	_ID	MPa	_mm	r_D	T_ID	L_ID
39	C	D_L_BOT	6629.28	185.969	0.7128	118	118
40	C	D_R_BOT	8503	238.532	0.9143	119	119
41	C	D_R_BOT	996.807	27.9631	0.1072	120	120
42	C	D_R_BOT	3852.21	108.065	0.4142	121	121
46	C	D_R_BOT	7604.58	213.329	0.8177	122	122
48	C	D_R_BOT	9177.57	257.455	0.9868	123	123
49	C	D_L_BOT	8422.58	236.276	0.9057	124	124
51	C	D_R_BOT	6868.97	192.693	0.7386	125	125
55	C	D_R_BOT	3270.99	91.7601	0.3517	126	126
56	C	D_L_BOT	5271.28	147.874	0.5668	127	127
57	C	D_R_BOT	5112.4	143.417	0.5497	128	128
58	C	D_L_BOT	7143.73	200.401	0.7681	129	129
60	C	D_L_BOT	6663.62	186.933	0.7165	130	130
61	C	D_R_BOT	6893.81	193.39	0.7413	131	131
63	C	D_R_BOT	9013.04	252.84	0.9691	132	132
65	C	D_L_BOT	6323.35	177.387	0.6799	133	133
66	C	D_L_BOT	8243.35	231.248	0.8864	134	134
67	C	D_L_BOT	4909.23	137.717	0.5279	135	135
70	C	D_R_BOT	9121.95	255.895	0.9809	136	136
71	C	D_R_BOT	6469.93	181.499	0.6957	137	137
73	C	D_L_BOT	5223.07	146.521	0.5616	138	138
74	C	D_L_BOT	8627.88	242.035	0.9277	139	139
75	C	D_L_BOT	8724.91	244.757	0.9382	140	140
76	C	D_L_BOT	8265.22	231.862	0.8887	141	141
77	C	D_L_BOT	7242.98	203.185	0.7788	142	142
80	C	D_R_BOT	4905.42	137.61	0.5275	143	143
83	C	D_L_BOT	8126.07	227.958	0.8738	144	144
84	C	D_R_BOT	8192.21	229.813	0.8809	145	145
85	C	D_R_BOT	7331.11	205.657	0.7883	146	146
87	C	D_L_BOT	8207.21	230.234	0.8825	147	147
89	C	D_R_BOT	6188.76	173.611	0.6655	148	148
93	C	D_L_BOT	4899.6	137.447	0.5268	149	149
97	C	D_L_BOT	6932.21	194.467	0.7454	150	150
98	C	D_L_BOT	4025.62	112.93	0.4329	151	151
99	C	D_R_BOT	6077.33	170.485	0.6535	152	152

C.3.28 stochastic_traceability_log_GS_E.csv

Iteration_I	Hazard_Zo	Component	Applied_EX_	Applied_ke_N	Damage_Facto	Dynamic_MA	Dynamic_REA
D	ne	_ID	MPa	_mm	r_D	T_ID	L_ID
1	E	G_C0_L21	4785.75	134.253	0.5146	101	101
1	E	G_C2_L0	5020.82	140.848	0.5399	102	102
1	E	G_C1_L2	5862.65	164.463	0.6304	103	103
1	E	G_C1_L3	7478.54	209.793	0.8041	104	104
1	E	G_C0_L3	6688.13	187.62	0.7192	105	105
1	E	G_C1_L4	9111.74	255.609	0.9798	106	106
1	E	G_C2_L0	8492.81	238.246	0.9132	107	107
1	E	G_C2_L2	9067.08	254.356	0.975	108	108
1	E	G_C0_L0	7273.85	204.051	0.7821	109	109
2	E	G_C1_L0	7275.81	204.106	0.7823	110	110
2	E	G_C1_L21	8709.52	244.325	0.9365	111	111
2	E	G_C0_L1	4834.33	135.616	0.5198	112	112
2	E	G_C2_L2	3005.23	84.3047	0.3231	113	113
2	E	G_C1_L4	5278.56	148.078	0.5676	114	114
2	E	G_C0_L3	3818.28	107.113	0.4106	115	115
2	E	G_C2_L1	5120.09	143.632	0.5505	116	116
2	E	G_C1_L3	7128.86	199.984	0.7665	117	117
2	E	G_C0_L0	3670.61	102.971	0.3947	118	118
2	E	G_C1_L2	7255.54	203.537	0.7802	119	119
2	E	G_C0_L2	8092.75	227.023	0.8702	120	120
3	E	G_C1_L0	7307.25	204.988	0.7857	121	121
3	E	G_C2_L0	3384.4	94.9416	0.3639	122	122
3	E	G_C2_L21	3964.95	111.227	0.4263	123	123
3	E	G_C0_L2	4944.47	138.706	0.5317	124	124
3	E	G_C2_L2	6827.66	191.534	0.7342	125	125
3	E	G_C1_L3	5163.42	144.848	0.5552	126	126

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
3	E	G_C0_L1	8346.35	234.138	0.8975	127	127
3	E	G_C0_L0	5517.51	154.781	0.5933	128	128
3	E	G_C1_L0	8701.43	244.099	0.9356	129	129
3	E	G_C0_L3	7111.81	199.506	0.7647	130	130
3	E	G_C2_L1	6915.4	193.996	0.7436	131	131
4	E	G_C2_L21	8555.08	239.993	0.9199	132	132
4	E	G_C1_L0	6639.71	186.262	0.7139	133	133
4	E	G_C1_L21	7341.89	205.96	0.7895	134	134
4	E	G_C0_L0	8893.54	249.488	0.9563	135	135
4	E	G_C1_L1	5243.47	147.093	0.5638	136	136
4	E	G_C1_L3	5200.33	145.883	0.5592	137	137
4	E	G_C0_L0	5791	162.453	0.6227	138	138
4	E	G_C2_L0	5813.59	163.087	0.6251	139	139
4	E	G_C1_L0	4048.29	113.566	0.4353	140	140
5	E	G_C0_L21	7091.27	198.929	0.7625	141	141
5	E	G_C1_L0	7228.71	202.785	0.7773	142	142
5	E	G_C1_L21	7176.71	201.326	0.7717	143	143
5	E	G_C2_L21	8327.35	233.605	0.8954	144	144
5	E	G_C1_L0	3554.23	99.7057	0.3822	145	145
5	E	G_C1_L4	4022.49	112.842	0.4325	146	146
5	E	G_C2_L2	6222.16	174.548	0.669	147	147
5	E	G_C2_L0	8762.05	245.799	0.9422	148	148
5	E	G_C2_L1	3758.86	105.446	0.4042	149	149
5	E	G_C0_L4	6531.33	183.221	0.7023	150	150
5	E	G_C2_L4	4072.95	114.257	0.438	151	151
5	E	D_R_BOT	6579.51	184.573	0.7075	152	152
6	E	G_C1_L21	8548.42	239.806	0.9192	153	153
6	E	G_C0_L21	8616.62	241.719	0.9265	154	154
6	E	G_C2_L21	4537.66	127.293	0.4879	155	155
6	E	G_C0_L1	6211.52	174.25	0.6679	156	156
6	E	G_C0_L0	8384.31	235.202	0.9015	157	157
6	E	G_C1_L1	6470.13	181.505	0.6957	158	158
6	E	G_C0_L2	5593.53	156.914	0.6015	159	159
6	E	G_C2_L3	6963.72	195.351	0.7488	160	160
7	E	G_C0_L21	7395.2	207.455	0.7952	161	161
7	E	G_C0_L0	6878.61	192.964	0.7396	162	162
7	E	G_C1_L21	6901.87	193.616	0.7421	163	163
7	E	G_C1_L0	7275.36	204.093	0.7823	164	164
7	E	G_C1_L0	6369.98	178.695	0.6849	165	165
7	E	G_C0_L1	6389.52	179.243	0.687	166	166
7	E	G_C2_L2	2235.87	62.7222	0.2404	167	167
7	E	G_C2_L4	5409.34	151.746	0.5816	168	168
7	E	G_C0_L0	8599.05	241.226	0.9246	169	169
7	E	G_C1_L1	6843.27	191.972	0.7358	170	170
8	E	G_C1_L21	6913.63	193.946	0.7434	171	171
8	E	G_C0_L21	7059.76	198.045	0.7591	172	172
8	E	G_C0_L3	7497.01	210.311	0.8061	173	173
8	E	G_C1_L3	3189.93	89.486	0.343	174	174
8	E	G_C1_L2	6771.3	189.953	0.7281	175	175
8	E	G_C2_L2	5904.71	165.643	0.6349	176	176
8	E	G_C0_L0	6622.92	185.791	0.7121	177	177
8	E	G_C2_L3	8149.07	228.603	0.8762	178	178
8	E	G_C0_L1	7251.15	203.414	0.7797	179	179
8	E	D_R_BOT	6678.06	187.338	0.7181	180	180
9	E	G_C0_L21	6635.92	186.155	0.7135	181	181
9	E	G_C2_L21	9112.21	255.622	0.9798	182	182
9	E	G_C0_L0	8769.2	246	0.9429	183	183
9	E	G_C1_L21	8095.49	227.1	0.8705	184	184
9	E	G_C1_L3	9095.99	255.167	0.9781	185	185
9	E	G_C1_L0	7002.85	196.449	0.753	186	186
9	E	G_C0_L2	6435.76	180.54	0.692	187	187
9	E	G_C2_L4	8883.49	249.206	0.9552	188	188
9	E	G_C1_L1	7890.27	221.343	0.8484	189	189
9	E	G_C0_L0	7777.74	218.187	0.8363	190	190
9	E	G_C2_L2	4452.76	124.912	0.4788	191	191
9	E	G_C1_L4	8667.32	243.142	0.932	192	192
9	E	G_C0_L4	4417.66	123.927	0.475	193	193
9	E	D_L_BOT	7077.69	198.548	0.761	194	194

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
10	E	G_C1_L0	6357.1	178.334	0.6836	195	195
10	E	G_C1_L21	8435.63	236.642	0.9071	196	196
10	E	G_C2_L0	7713.79	216.393	0.8294	197	197
10	E	G_C0_L4	8822.72	247.501	0.9487	198	198
10	E	G_C1_L1	7141.24	200.331	0.7679	199	199
10	E	G_C1_L2	8373.68	234.904	0.9004	200	200
10	E	G_C0_L1	4913.28	137.831	0.5283	201	201
10	E	G_C2_L2	8312.85	233.198	0.8939	202	202
10	E	G_C0_L0	6998.02	196.313	0.7525	203	203
10	E	G_C2_L1	6729.54	188.782	0.7236	204	204
10	E	G_C1_L4	6416.68	180.005	0.69	205	205
10	E	D_L_BOT	3444.94	96.6398	0.3704	206	206
11	E	G_C2_L0	7538.7	211.481	0.8106	207	207
11	E	G_C1_L0	8593.18	241.062	0.924	208	208
11	E	G_C0_L2	9179.4	257.507	0.987	209	209
11	E	G_C1_L4	6798.63	190.72	0.731	210	210
11	E	G_C1_L2	8567.87	240.352	0.9213	211	211
11	E	G_C0_L0	5325.37	149.391	0.5726	212	212
11	E	G_C2_L0	8875	248.968	0.9543	213	213
12	E	G_C2_L21	7574.97	212.498	0.8145	214	214
12	E	G_C1_L21	6908.54	193.803	0.7429	215	215
12	E	G_C0_L21	1433.02	40.2002	0.1541	216	216
12	E	G_C1_L0	8548.25	239.801	0.9192	217	217
12	E	G_C0_L4	8464.65	237.456	0.9102	218	218
12	E	G_C0_L1	8103.22	227.317	0.8713	219	219
12	E	G_C2_L4	3423.42	96.0362	0.3681	220	220
12	E	G_C0_L2	9137.58	256.334	0.9825	221	221
12	E	G_C1_L2	7291.19	204.537	0.784	222	222
12	E	G_C2_L1	9243.42	259.303	0.9939	223	223
12	E	G_C1_L0	9206.27	258.261	0.9899	224	224
12	E	D_L_BOT	4300.18	120.632	0.4624	225	225
13	E	G_C1_L0	9158.53	256.921	0.9848	226	226
13	E	G_C1_L21	5207.95	146.097	0.56	227	227
13	E	G_C0_L0	8538.88	239.538	0.9182	228	228
13	E	G_C2_L0	3996.54	112.114	0.4297	229	229
13	E	G_C1_L1	6738.11	189.022	0.7245	230	230
13	E	G_C1_L4	8993.25	252.285	0.967	231	231
13	E	G_C0_L1	7013.21	196.739	0.7541	232	232
13	E	G_C1_L2	5420.49	152.059	0.5828	233	233
13	E	G_C2_L4	8982.19	251.975	0.9658	234	234
13	E	G_C1_L3	7420.86	208.175	0.7979	235	235
13	E	G_C2_L1	7392.12	207.369	0.7949	236	236
13	E	G_C0_L2	6296.17	176.625	0.677	237	237
14	E	G_C2_L0	7872.83	220.854	0.8465	238	238
14	E	G_C1_L21	6411.48	179.859	0.6894	239	239
14	E	G_C2_L2	2497.08	70.0498	0.2685	240	240
14	E	G_C0_L3	9188.46	257.761	0.988	241	241
14	E	G_C0_L2	8329.49	233.665	0.8956	242	242
14	E	G_C0_L1	6015.38	168.748	0.6468	243	243
14	E	G_C1_L0	9066.52	254.34	0.9749	244	244
14	E	D_L_BOT	6843.16	191.969	0.7358	245	245
15	E	G_C0_L21	8358.97	234.492	0.8988	246	246
15	E	G_C2_L21	8222.3	230.658	0.8841	247	247
15	E	G_C1_L0	8764.98	245.881	0.9425	248	248
15	E	G_C2_L0	5368.12	150.59	0.5772	249	249
15	E	G_C1_L1	7338.79	205.873	0.7891	250	250
15	E	G_C2_L0	2878.36	80.7457	0.3095	251	251
15	E	G_C1_L4	5849.86	164.104	0.629	252	252
15	E	G_C2_L3	8266.06	231.885	0.8888	253	253
15	E	G_C2_L1	8188.92	229.721	0.8805	254	254
15	E	G_C0_L2	8427.79	236.422	0.9062	255	255
15	E	G_C2_L2	8089.19	226.923	0.8698	256	256
15	E	G_C0_L0	4935.6	138.457	0.5307	257	257
15	E	G_C1_L3	7084.85	198.749	0.7618	258	258
15	E	D_R_BOT	8638.22	242.325	0.9288	259	259
16	E	G_C0_L0	4911.6	137.784	0.5281	260	260
16	E	G_C1_L21	5560.11	155.976	0.5979	261	261
16	E	G_C2_L0	3337.69	93.6313	0.3589	262	262

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
16	E	G_C1_L0	7849	220.186	0.844	263	263
16	E	G_C2_L3	4024.92	112.91	0.4328	264	264
16	E	G_C1_L4	6578.92	184.556	0.7074	265	265
16	E	G_C1_L3	5762.5	161.654	0.6196	266	266
16	E	G_C0_L1	5520.37	154.861	0.5936	267	267
16	E	G_C0_L4	8954.43	251.196	0.9628	268	268
16	E	G_C2_L1	9254.26	259.607	0.9951	269	269
16	E	G_C1_L2	7583.01	212.724	0.8154	270	270
16	E	G_C1_L1	6495.42	182.214	0.6984	271	271
16	E	D_L_BOT	7785.42	218.402	0.8371	272	272
17	E	G_C1_L0	6148.1	172.471	0.6611	273	273
17	E	G_C1_L21	5903.06	165.597	0.6347	274	274
17	E	G_C0_L21	7586.55	212.823	0.8158	275	275
17	E	G_C2_L1	8487.46	238.096	0.9126	276	276
17	E	G_C2_L0	8786.62	246.488	0.9448	277	277
17	E	G_C0_L2	6912.92	193.926	0.7433	278	278
17	E	G_C1_L2	6159.88	172.801	0.6624	279	279
17	E	G_C1_L1	4833.8	135.601	0.5198	280	280
17	E	G_C0_L1	6540.6	183.482	0.7033	281	281
17	E	G_C1_L0	7991.06	224.171	0.8593	282	282
17	E	G_C2_L3	5587.38	156.741	0.6008	283	283
18	E	G_C1_L21	5244.36	147.118	0.5639	284	284
18	E	G_C2_L21	6653.13	186.638	0.7154	285	285
18	E	G_C2_L0	8864.26	248.666	0.9531	286	286
18	E	G_C1_L2	6006.05	168.486	0.6458	287	287
18	E	G_C0_L3	7372.2	206.81	0.7927	288	288
18	E	G_C2_L3	7765.82	217.852	0.835	289	289
18	E	G_C2_L4	3646.78	102.302	0.3921	290	290
18	E	G_C0_L0	1602.51	44.9548	0.1723	291	291
18	E	D_L_BOT	8430.87	236.508	0.9065	292	292
19	E	G_C2_L21	6321.54	177.336	0.6797	293	293
19	E	G_C0_L0	8831.63	247.751	0.9496	294	294
19	E	G_C1_L0	5655	158.638	0.6081	295	295
19	E	G_C2_L0	5758.33	161.537	0.6192	296	296
19	E	G_C1_L1	8670.05	243.218	0.9323	297	297
19	E	G_C2_L3	9052.83	253.956	0.9734	298	298
19	E	G_C1_L2	8702.43	244.126	0.9357	299	299
19	E	G_C0_L3	6678.16	187.34	0.7181	300	300
19	E	G_C2_L1	8804.46	246.989	0.9467	301	301
19	E	D_R_BOT	3037.69	85.2154	0.3266	302	302
20	E	G_C0_L21	7216.97	202.455	0.776	303	303
20	E	G_C2_L21	5592.73	156.891	0.6014	304	304
20	E	G_C2_L0	5160.36	144.762	0.5549	305	305
20	E	G_C2_L3	8003.79	224.528	0.8606	306	306
20	E	G_C2_L0	6348.29	178.087	0.6826	307	307
20	E	G_C1_L3	4959.31	139.122	0.5333	308	308
20	E	G_C1_L1	6041.37	169.477	0.6496	309	309
20	E	G_C0_L3	8741.02	245.209	0.9399	310	310
21	E	G_C2_L0	5094.24	142.907	0.5478	311	311
21	E	G_C2_L21	6317.44	177.221	0.6793	312	312
21	E	G_C0_L0	6410.95	179.844	0.6893	313	313
21	E	G_C0_L21	6636.83	186.181	0.7136	314	314
21	E	G_C0_L1	7241.5	203.144	0.7787	315	315
21	E	G_C0_L0	6775.7	190.077	0.7286	316	316
21	E	G_C0_L2	5498.02	154.234	0.5912	317	317
21	E	G_C1_L2	8506.48	238.63	0.9147	318	318
21	E	G_C1_L3	8566.91	240.325	0.9212	319	319
21	E	D_L_BOT	7246.57	203.286	0.7792	320	320
22	E	G_C2_L0	9231.55	258.97	0.9926	321	321
22	E	G_C0_L0	6774.64	190.047	0.7285	322	322
22	E	G_C2_L4	8646.37	242.554	0.9297	323	323
22	E	G_C1_L4	9096.42	255.179	0.9781	324	324
22	E	G_C1_L2	8878.63	249.069	0.9547	325	325
22	E	G_C1_L0	7466.65	209.46	0.8029	326	326
22	E	G_C0_L4	7390.96	207.336	0.7947	327	327
22	E	G_C0_L0	9111.07	255.59	0.9797	328	328
22	E	G_C1_L3	4602.59	129.115	0.4949	329	329
22	E	D_L_BOT	5421.73	152.094	0.583	330	330

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
23	E	G_C1_L21	6211.56	174.251	0.6679	331	331
23	E	G_C0_L21	7111.26	199.49	0.7647	332	332
23	E	G_C2_L21	8946.33	250.969	0.962	333	333
23	E	G_C1_L0	5933.71	166.457	0.638	334	334
23	E	G_C2_L3	6198.33	173.88	0.6665	335	335
23	E	G_C0_L2	7495.58	210.271	0.806	336	336
23	E	G_C0_L1	8142.53	228.42	0.8755	337	337
23	E	G_C0_L4	6999.57	196.357	0.7526	338	338
23	E	G_C1_L2	7905.51	221.771	0.8501	339	339
23	E	D_R_BOT	7044.46	197.616	0.7575	340	340
24	E	G_C0_L0	7686.14	215.617	0.8265	341	341
24	E	G_C2_L21	4187.14	117.46	0.4502	342	342
24	E	G_C0_L21	8274.95	232.135	0.8898	343	343
24	E	G_C1_L4	4496.04	126.126	0.4834	344	344
24	E	G_C2_L3	9217.41	258.573	0.9911	345	345
24	E	G_C1_L0	7769.62	217.959	0.8354	346	346
24	E	G_C0_L2	9209.29	258.345	0.9902	347	347
24	E	G_C2_L4	2363.53	66.3033	0.2541	348	348
24	E	G_C1_L3	8245.85	231.318	0.8867	349	349
24	E	G_C2_L2	6805.6	190.915	0.7318	350	350
24	E	G_C0_L3	8017.03	224.899	0.862	351	351
24	E	D_R_BOT	8357.93	234.463	0.8987	352	352
25	E	G_C1_L0	7471.58	209.598	0.8034	353	353
25	E	G_C2_L21	4632.96	129.967	0.4982	354	354
25	E	G_C1_L0	8342.9	234.041	0.8971	355	355
25	E	G_C0_L2	1992.02	55.8815	0.2142	356	356
25	E	G_C1_L1	7033.67	197.313	0.7563	357	357
25	E	G_C0_L0	5736.18	160.915	0.6168	358	358
25	E	G_C2_L3	6243.56	175.149	0.6714	359	359
25	E	G_C0_L3	3297.75	92.5106	0.3546	360	360
25	E	G_C2_L4	1085.51	30.4514	0.1167	361	361
25	E	G_C2_L0	5387.66	151.138	0.5793	362	362
26	E	G_C1_L0	8931.02	250.539	0.9603	363	363
26	E	G_C0_L0	3578.77	100.394	0.3848	364	364
26	E	G_C1_L4	4768.06	133.757	0.5127	365	365
26	E	G_C0_L0	5892.68	165.305	0.6336	366	366
26	E	G_C2_L1	8149.78	228.623	0.8763	367	367
26	E	G_C2_L0	5376.32	150.82	0.5781	368	368
26	E	G_C2_L4	4661.85	130.777	0.5013	369	369
26	E	G_C2_L3	5810.66	163.005	0.6248	370	370
26	E	D_R_BOT	3917.06	109.884	0.4212	371	371
27	E	G_C1_L21	5797.74	162.642	0.6234	372	372
27	E	G_C2_L0	8057.84	226.044	0.8664	373	373
27	E	G_C1_L0	7201.45	202.02	0.7743	374	374
27	E	G_C0_L2	4526.5	126.98	0.4867	375	375
27	E	G_C2_L2	2597.78	72.8746	0.2793	376	376
27	E	G_C2_L1	5719.59	160.45	0.615	377	377
27	E	G_C1_L1	6612.86	185.508	0.7111	378	378
27	E	G_C1_L2	6791.27	190.513	0.7302	379	379
27	E	G_C2_L4	7213.29	202.352	0.7756	380	380
27	E	G_C0_L0	6365.43	178.567	0.6845	381	381
27	E	G_C0_L1	8086.86	226.858	0.8696	382	382
27	E	D_R_BOT	8104.25	227.346	0.8714	383	383
28	E	G_C2_L0	5302.48	148.749	0.5702	384	384
28	E	G_C0_L21	7464.53	209.4	0.8026	385	385
28	E	G_C1_L0	6331.64	177.619	0.6808	386	386
28	E	G_C0_L4	8978.59	251.874	0.9654	387	387
28	E	G_C1_L3	5928.28	166.304	0.6374	388	388
28	E	G_C1_L4	2144.81	60.1676	0.2306	389	389
28	E	G_C0_L2	6419.42	180.082	0.6903	390	390
28	E	G_C2_L3	7089.24	198.872	0.7623	391	391
28	E	G_C1_L1	4766.36	133.709	0.5125	392	392
29	E	G_C0_L0	8275.04	232.137	0.8898	393	393
29	E	G_C1_L21	5542.62	155.485	0.596	394	394
29	E	G_C1_L0	7189.28	201.679	0.773	395	395
29	E	G_C2_L0	7348.93	206.157	0.7902	396	396
29	E	G_C1_L1	5799.53	162.692	0.6236	397	397
29	E	G_C0_L0	8328.11	233.626	0.8955	398	398

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
29	E	G_C0_L2	5861.85	164.44	0.6303	399	399
29	E	G_C0_L1	6718.28	188.466	0.7224	400	400
29	E	G_C2_L0	9154.88	256.819	0.9844	401	401
29	E	D_R_BOT	5950.28	166.921	0.6398	402	402
30	E	G_C0_L21	7741.52	217.171	0.8324	403	403
30	E	G_C2_L0	6509.12	182.598	0.6999	404	404
30	E	G_C0_L0	2384.34	66.8872	0.2564	405	405
30	E	G_C1_L0	2132.82	59.8313	0.2293	406	406
30	E	G_C0_L0	6817.23	191.242	0.733	407	407
30	E	G_C0_L2	5598.06	157.041	0.6019	408	408
30	E	G_C0_L4	2707.87	75.963	0.2912	409	409
30	E	G_C1_L0	5459.89	153.165	0.5871	410	410
30	E	G_C1_L2	7903.62	221.718	0.8499	411	411
30	E	G_C2_L3	3282.85	92.0928	0.353	412	412
30	E	G_C2_L1	9279.5	260.315	0.9978	413	413
30	E	G_C0_L3	8156.59	228.814	0.8771	414	414
30	E	G_C1_L3	4335.59	121.625	0.4662	415	415
30	E	D_R_BOT	7966.97	223.495	0.8567	416	416
31	E	G_C0_L21	1609	45.1368	0.173	417	417
31	E	G_C2_L21	2827.21	79.311	0.304	418	418
31	E	G_C1_L0	6815.73	191.2	0.7329	419	419
31	E	G_C1_L21	5359.55	150.35	0.5763	420	420
31	E	G_C1_L3	3452.06	96.8395	0.3712	421	421
31	E	G_C1_L2	8516.91	238.922	0.9158	422	422
31	E	G_C1_L4	8235.32	231.023	0.8855	423	423
31	E	G_C1_L0	6387.54	179.188	0.6868	424	424
31	E	G_C1_L1	7257.25	203.585	0.7803	425	425
31	E	G_C0_L0	7155.07	200.719	0.7694	426	426
31	E	G_C0_L4	5757.83	161.523	0.6191	427	427
31	E	G_C2_L4	2009.54	56.3729	0.2161	428	428
31	E	G_C2_L0	7587.63	212.853	0.8159	429	429
31	E	D_R_BOT	9238.55	259.166	0.9934	430	430
32	E	G_C0_L21	5542.32	155.477	0.5959	431	431
32	E	G_C1_L21	8081.14	226.698	0.8689	432	432
32	E	G_C2_L0	4835.12	135.638	0.5199	433	433
32	E	G_C2_L4	8722.41	244.687	0.9379	434	434
32	E	G_C1_L0	2974.87	83.4532	0.3199	435	435
32	E	G_C1_L1	5267.1	147.756	0.5664	436	436
32	E	G_C2_L3	6984.41	195.931	0.751	437	437
32	E	G_C2_L2	7714.03	216.399	0.8295	438	438
32	E	G_C0_L2	7078.7	198.576	0.7612	439	439
32	E	G_C0_L0	4085.91	114.621	0.4393	440	440
32	E	G_C2_L1	8568.48	240.369	0.9213	441	441
33	E	G_C1_L21	6070.5	170.294	0.6527	442	442
33	E	G_C0_L0	5172.12	145.092	0.5561	443	443
33	E	G_C0_L21	9107.31	255.485	0.9793	444	444
33	E	G_C0_L2	7348.09	206.134	0.7901	445	445
33	E	G_C0_L0	5492.93	154.092	0.5906	446	446
33	E	G_C1_L4	6038.1	169.385	0.6493	447	447
33	E	G_C0_L4	6311.04	177.042	0.6786	448	448
33	E	G_C2_L4	8440.4	236.776	0.9076	449	449
33	E	G_C1_L2	9199.48	258.07	0.9892	450	450
33	E	G_C2_L1	8552.72	239.927	0.9196	451	451
33	E	G_C2_L2	8729.75	244.893	0.9387	452	452
34	E	G_C1_L0	8422.84	236.283	0.9057	453	453
34	E	G_C1_L21	6667.11	187.03	0.7169	454	454
34	E	G_C2_L0	6842.99	191.964	0.7358	455	455
34	E	G_C0_L21	4637.38	130.091	0.4986	456	456
34	E	G_C2_L2	7623.75	213.867	0.8198	457	457
34	E	G_C1_L2	4381.89	122.924	0.4712	458	458
34	E	G_C1_L3	3137.87	88.0257	0.3374	459	459
34	E	G_C0_L0	6634.9	186.127	0.7134	460	460
34	E	G_C0_L1	8993.99	252.306	0.9671	461	461
35	E	G_C1_L0	8938.41	250.746	0.9611	462	462
35	E	G_C2_L0	9294.21	260.728	0.9994	463	463
35	E	G_C0_L4	5994.08	168.15	0.6445	464	464
35	E	G_C0_L2	4419.18	123.97	0.4752	465	465
35	E	G_C2_L2	9032.69	253.391	0.9713	466	466

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
35	E	G_C1_L1	9242.53	259.278	0.9938	467	467
35	E	G_C1_L4	8119.21	227.766	0.873	468	468
35	E	D_R_BOT	5671	159.087	0.6098	469	469
36	E	G_C1_L21	5856.06	164.278	0.6297	470	470
36	E	G_C0_L21	8509.43	238.713	0.915	471	471
36	E	G_C2_L1	8368.61	234.762	0.8999	472	472
36	E	G_C0_L3	7908.76	221.862	0.8504	473	473
36	E	G_C1_L2	4877.89	136.838	0.5245	474	474
36	E	G_C0_L2	4511.85	126.57	0.4851	475	475
36	E	G_C2_L3	3913.14	109.774	0.4208	476	476
36	E	G_C1_L1	4469.61	125.385	0.4806	477	477
36	E	G_C1_L0	4771.13	133.843	0.513	478	478
37	E	G_C1_L21	6524.07	183.018	0.7015	479	479
37	E	G_C0_L21	6201.13	173.958	0.6668	480	480
37	E	G_C2_L0	6363.1	178.502	0.6842	481	481
37	E	G_C0_L0	8152.7	228.705	0.8766	482	482
37	E	G_C0_L2	6910.58	193.86	0.7431	483	483
37	E	G_C2_L4	8515.93	238.895	0.9157	484	484
37	E	G_C2_L1	5441.31	152.643	0.5851	485	485
38	E	G_C2_L21	8172.22	229.253	0.8787	486	486
38	E	G_C1_L21	1915.02	53.7216	0.2059	487	487
38	E	G_C2_L4	2891.96	81.1273	0.311	488	488
38	E	G_C0_L0	4627.24	129.806	0.4976	489	489
38	E	G_C0_L1	6476.82	181.692	0.6964	490	490
38	E	G_C2_L2	2791.89	78.3201	0.3002	491	491
38	E	G_C2_L1	8719.31	244.6	0.9376	492	492
38	E	G_C1_L1	5638.34	158.171	0.6063	493	493
38	E	G_C2_L0	4880.06	136.899	0.5247	494	494
38	E	G_C1_L2	5805.06	162.847	0.6242	495	495
38	E	D_L_BOT	6597.79	185.086	0.7094	496	496
39	E	G_C0_L0	6596.65	185.054	0.7093	497	497
39	E	G_C1_L21	9054.5	254.003	0.9736	498	498
39	E	G_C2_L0	8611.31	241.57	0.9259	499	499
39	E	G_C0_L0	8279.94	232.274	0.8903	500	500
39	E	G_C1_L3	6836.68	191.787	0.7351	501	501
39	E	G_C0_L3	5198.54	145.833	0.559	502	502
39	E	G_C1_L2	6231.37	174.807	0.67	503	503
39	E	G_C2_L0	8887.21	249.31	0.9556	504	504
39	E	G_C1_L0	8820.05	247.426	0.9484	505	505
40	E	G_C2_L21	9082.36	254.785	0.9766	506	506
40	E	G_C1_L0	7687.3	215.65	0.8266	507	507
40	E	G_C1_L2	5614.04	157.489	0.6037	508	508
40	E	G_C0_L3	7725.11	216.71	0.8307	509	509
40	E	G_C1_L0	7045.18	197.636	0.7575	510	510
40	E	G_C1_L1	7278.25	204.175	0.7826	511	511
40	E	G_C0_L2	8722.02	244.676	0.9379	512	512
40	E	G_C2_L4	4266.63	119.69	0.4588	513	513
40	E	D_R_BOT	9011.17	252.787	0.9689	514	514
41	E	G_C1_L21	6308.83	176.98	0.6784	515	515
41	E	G_C1_L0	5266.52	147.74	0.5663	516	516
41	E	G_C2_L0	7784.88	218.387	0.8371	517	517
41	E	G_C0_L21	867.095	24.3243	0.0932	518	518
41	E	G_C1_L4	6411.48	179.859	0.6894	519	519
41	E	G_C0_L2	8211.77	230.362	0.883	520	520
41	E	G_C0_L1	5752.85	161.383	0.6186	521	521
41	E	G_C2_L0	9179.68	257.515	0.9871	522	522
41	E	G_C1_L0	8550.48	239.864	0.9194	523	523
41	E	G_C1_L3	7961.07	223.329	0.856	524	524
41	E	G_C0_L3	1584.1	44.4382	0.1703	525	525
41	E	G_C2_L4	8580.4	240.703	0.9226	526	526
41	E	G_C1_L1	6514.42	182.747	0.7005	527	527
42	E	G_C0_L0	5503.6	154.391	0.5918	528	528
42	E	G_C2_L21	5581.17	156.567	0.6001	529	529
42	E	G_C1_L21	7394.55	207.437	0.7951	530	530
42	E	G_C1_L1	8941.78	250.841	0.9615	531	531
42	E	G_C1_L3	6300.03	176.733	0.6774	532	532
42	E	G_C0_L3	8312.41	233.186	0.8938	533	533
42	E	G_C2_L1	5545.46	155.565	0.5963	534	534

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
42	E	G_C2_L3	7848.39	220.168	0.8439	535	535
42	E	G_C0_L4	4468.03	125.34	0.4804	536	536
42	E	G_C1_L0	1979.15	55.5204	0.2128	537	537
42	E	G_C2_L4	6447.36	180.866	0.6933	538	538
42	E	G_C0_L2	7087.4	198.821	0.7621	539	539
42	E	D_R_BOT	7057.9	197.993	0.7589	540	540
43	E	G_C2_L21	8523.1	239.096	0.9165	541	541
43	E	G_C0_L0	7605.25	213.348	0.8178	542	542
43	E	G_C1_L21	5985.55	167.911	0.6436	543	543
43	E	G_C0_L3	8586.11	240.863	0.9232	544	544
43	E	G_C1_L3	6570.1	184.309	0.7065	545	545
43	E	G_C0_L2	5671.89	159.112	0.6099	546	546
43	E	G_C2_L3	7472.2	209.615	0.8035	547	547
43	E	G_C1_L1	4783.74	134.197	0.5144	548	548
43	E	D_L_BOT	8700.96	244.085	0.9356	549	549
44	E	G_C2_L0	7421.27	208.186	0.798	550	550
44	E	G_C1_L21	8530.67	239.308	0.9173	551	551
44	E	G_C2_L2	5277.3	148.043	0.5675	552	552
44	E	G_C1_L0	3061.7	85.8889	0.3292	553	553
44	E	G_C1_L1	7133.18	200.105	0.767	554	554
44	E	G_C0_L4	8886.27	249.284	0.9555	555	555
44	E	G_C0_L3	6152.22	172.586	0.6615	556	556
44	E	G_C0_L1	8399.8	235.637	0.9032	557	557
44	E	D_L_BOT	4672.01	131.062	0.5024	558	558
45	E	G_C1_L21	1837.12	51.5362	0.1975	559	559
45	E	G_C1_L0	6742.23	189.138	0.725	560	560
45	E	G_C0_L21	8772.84	246.102	0.9433	561	561
45	E	G_C0_L0	8320.38	233.409	0.8947	562	562
45	E	G_C2_L1	7684.05	215.558	0.8262	563	563
45	E	G_C0_L1	4089.67	114.726	0.4397	564	564
45	E	G_C0_L3	6798.29	190.71	0.731	565	565
45	E	G_C2_L3	7240.85	203.125	0.7786	566	566
45	E	G_C1_L3	5741.86	161.075	0.6174	567	567
45	E	G_C0_L4	8279.31	232.257	0.8902	568	568
45	E	G_C1_L0	4870.4	136.628	0.5237	569	569
45	E	G_C1_L1	3086.82	86.5937	0.3319	570	570
46	E	G_C0_L0	1374.87	38.5689	0.1478	571	571
46	E	G_C0_L21	8974.98	251.772	0.9651	572	572
46	E	G_C1_L0	5460.11	153.171	0.5871	573	573
46	E	G_C2_L4	7503.21	210.485	0.8068	574	574
46	E	G_C1_L1	8762.48	245.811	0.9422	575	575
46	E	G_C0_L3	8469.52	237.593	0.9107	576	576
46	E	G_C1_L4	8611.13	241.565	0.9259	577	577
46	E	G_C0_L1	1321.77	37.0793	0.1421	578	578
46	E	G_C1_L3	5714.55	160.309	0.6145	579	579
46	E	G_C0_L0	3196.57	89.6723	0.3437	580	580
46	E	G_C1_L0	2316.07	64.9721	0.249	581	581
46	E	D_R_BOT	6606.36	185.326	0.7104	582	582
47	E	G_C2_L0	4319.72	121.18	0.4645	583	583
47	E	G_C1_L21	6202.72	174.003	0.667	584	584
47	E	G_C1_L0	4082.45	114.524	0.439	585	585
47	E	G_C2_L0	7404.92	207.728	0.7962	586	586
47	E	G_C0_L1	3216.55	90.2328	0.3459	587	587
47	E	G_C1_L3	8071.06	226.415	0.8679	588	588
47	E	G_C0_L0	7570.07	212.361	0.814	589	589
47	E	G_C0_L2	6660.36	186.841	0.7162	590	590
48	E	G_C1_L0	5116.52	143.532	0.5502	591	591
48	E	G_C0_L21	8539.75	239.563	0.9183	592	592
48	E	G_C2_L21	3873.25	108.655	0.4165	593	593
48	E	G_C2_L1	7150.11	200.58	0.7688	594	594
48	E	G_C1_L2	9106.65	255.466	0.9792	595	595
48	E	G_C0_L4	6044.51	169.565	0.6499	596	596
48	E	G_C0_L2	8311.56	233.162	0.8937	597	597
48	E	G_C1_L4	3351.7	94.0241	0.3604	598	598
48	E	G_C0_L3	6389.39	179.239	0.687	599	599
48	E	G_C2_L3	7767.85	217.909	0.8353	600	600
48	E	G_C2_L0	6620.09	185.712	0.7118	601	601
48	E	G_C2_L2	9048.6	253.838	0.973	602	602

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
49	E	G_C2_L21	4093.53	114.835	0.4402	603	603
49	E	G_C1_L21	8112.14	227.567	0.8723	604	604
49	E	G_C2_L0	8021.12	225.014	0.8625	605	605
49	E	G_C0_L0	6561.67	184.072	0.7056	606	606
49	E	G_C0_L2	2636.4	73.9581	0.2835	607	607
49	E	G_C2_L0	8744.07	245.295	0.9402	608	608
49	E	G_C1_L4	5037.77	141.323	0.5417	609	609
49	E	G_C0_L1	1662.91	46.649	0.1788	610	610
49	E	G_C0_L3	8356.43	234.42	0.8985	611	611
49	E	G_C1_L3	6396.75	179.446	0.6878	612	612
50	E	G_C2_L21	7943.72	222.843	0.8542	613	613
50	E	G_C0_L21	6636.15	186.162	0.7136	614	614
50	E	G_C1_L0	5041.7	141.433	0.5421	615	615
50	E	G_C0_L3	5845.28	163.976	0.6285	616	616
50	E	G_C1_L3	5699.62	159.89	0.6129	617	617
50	E	G_C0_L1	4605.5	129.197	0.4952	618	618
50	E	G_C2_L4	6270.1	175.893	0.6742	619	619
50	E	G_C1_L1	6143.49	172.341	0.6606	620	620
50	E	G_C1_L2	4233.48	118.76	0.4552	621	621
51	E	G_C2_L21	6313	177.097	0.6788	622	622
51	E	G_C2_L0	6944.23	194.804	0.7467	623	623
51	E	G_C1_L0	7934.71	222.59	0.8532	624	624
51	E	G_C0_L21	2966.64	83.2222	0.319	625	625
51	E	G_C1_L3	4916.5	137.921	0.5287	626	626
51	E	G_C0_L1	5392.99	151.288	0.5799	627	627
51	E	G_C1_L2	8010.37	224.712	0.8613	628	628
51	E	G_C0_L4	6489.98	182.061	0.6978	629	629
51	E	G_C1_L4	3499.16	98.1607	0.3763	630	630
51	E	G_C0_L0	7592.07	212.978	0.8164	631	631
51	E	D_R_BOT	8753.3	245.554	0.9412	632	632
52	E	G_C1_L21	8296.39	232.736	0.8921	633	633
52	E	G_C2_L21	7561.41	212.118	0.8131	634	634
52	E	G_C0_L3	6385.66	179.135	0.6866	635	635
52	E	G_C0_L2	7553.54	211.897	0.8122	636	636
52	E	G_C1_L0	7142	200.352	0.768	637	637
52	E	G_C1_L4	8849.35	248.248	0.9515	638	638
52	E	G_C2_L3	9133.89	256.23	0.9821	639	639
52	E	G_C1_L1	8073.49	226.483	0.8681	640	640
52	E	G_C1_L2	6710.27	188.241	0.7215	641	641
52	E	G_C0_L4	3274.76	91.8659	0.3521	642	642
52	E	D_L_BOT	8564	240.243	0.9209	643	643
53	E	G_C2_L21	6779.93	190.195	0.729	644	644
53	E	G_C1_L0	5336.18	149.694	0.5738	645	645
53	E	G_C0_L21	7704.18	216.123	0.8284	646	646
53	E	G_C1_L4	7221.2	202.574	0.7765	647	647
53	E	G_C2_L0	5114.64	143.48	0.55	648	648
53	E	G_C0_L3	7104.92	199.312	0.764	649	649
53	E	G_C0_L4	4728.86	132.657	0.5085	650	650
53	E	G_C2_L1	7423.93	208.261	0.7983	651	651
54	E	G_C2_L21	6942.47	194.755	0.7465	652	652
54	E	G_C1_L21	4146.34	116.316	0.4458	653	653
54	E	G_C1_L0	4967.35	139.348	0.5341	654	654
54	E	G_C0_L0	8938.7	250.755	0.9612	655	655
54	E	G_C0_L1	7353.9	206.297	0.7907	656	656
54	E	G_C2_L1	9050.19	253.882	0.9731	657	657
54	E	G_C1_L3	2452.05	68.7866	0.2637	658	658
54	E	G_C1_L2	7658.71	214.847	0.8235	659	659
54	E	G_C1_L4	7008.61	196.611	0.7536	660	660
55	E	G_C2_L21	4369.89	122.587	0.4699	661	661
55	E	G_C1_L21	7878.38	221.01	0.8471	662	662
55	E	G_C0_L21	6949.93	194.964	0.7473	663	663
55	E	G_C1_L0	7774.54	218.097	0.836	664	664
55	E	G_C2_L3	5499.73	154.282	0.5914	665	665
55	E	G_C2_L0	6045.96	169.605	0.6501	666	666
55	E	G_C0_L3	6787.7	190.413	0.7299	667	667
55	E	G_C1_L4	7426.48	208.333	0.7985	668	668
55	E	G_C2_L1	7301.71	204.833	0.7851	669	669
55	E	G_C0_L4	8406.81	235.834	0.904	670	670

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
55	E	G_C1_L3	7330.23	205.633	0.7882	671	671
56	E	G_C0_L0	4176.71	117.168	0.4491	672	672
56	E	G_C2_L21	4743.49	133.068	0.5101	673	673
56	E	G_C1_L1	5774.76	161.998	0.6209	674	674
56	E	G_C1_L0	6917.17	194.045	0.7438	675	675
56	E	G_C1_L3	4710.47	132.141	0.5065	676	676
56	E	G_C1_L2	8536.63	239.475	0.9179	677	677
56	E	G_C2_L4	7634.04	214.155	0.8209	678	678
56	E	G_C0_L0	5620.48	157.67	0.6044	679	679
56	E	G_C0_L4	5170.08	145.035	0.5559	680	680
56	E	G_C2_L3	8678.76	243.463	0.9332	681	681
56	E	G_C1_L4	6023.65	168.98	0.6477	682	682
57	E	G_C1_L21	8611.85	241.586	0.926	683	683
57	E	G_C0_L21	7596.15	213.092	0.8168	684	684
57	E	G_C1_L0	7917.52	222.108	0.8513	685	685
57	E	G_C2_L0	6955.43	195.119	0.7479	686	686
57	E	G_C2_L4	6829.15	191.576	0.7343	687	687
57	E	G_C2_L1	7837.09	219.851	0.8427	688	688
57	E	G_C0_L1	8749.45	245.446	0.9408	689	689
57	E	G_C1_L0	6357.98	178.358	0.6837	690	690
57	E	G_C1_L2	3974.68	111.501	0.4274	691	691
57	E	G_C2_L0	5623.82	157.763	0.6047	692	692
57	E	G_C1_L1	5349.61	150.071	0.5752	693	693
57	E	D_L_BOT	8747.14	245.381	0.9406	694	694
58	E	G_C0_L21	4062.97	113.977	0.4369	695	695
58	E	G_C2_L0	5352.73	150.159	0.5756	696	696
58	E	G_C2_L21	3067.29	86.0456	0.3298	697	697
58	E	G_C1_L0	7648.99	214.575	0.8225	698	698
58	E	G_C2_L3	8014.55	224.83	0.8618	699	699
58	E	G_C2_L1	8279.88	232.273	0.8903	700	700
58	E	G_C0_L0	2650.19	74.345	0.285	701	701
58	E	G_C2_L2	2565.46	71.968	0.2759	702	702
58	E	G_C0_L2	9184.82	257.659	0.9876	703	703
58	E	G_C0_L4	5194.73	145.726	0.5586	704	704
58	E	G_C1_L0	6037.29	169.362	0.6492	705	705
58	E	G_C1_L3	3878.56	108.804	0.417	706	706
59	E	G_C2_L21	4990.26	139.99	0.5366	707	707
59	E	G_C2_L0	7167.66	201.072	0.7707	708	708
59	E	G_C2_L2	7499.41	210.379	0.8064	709	709
59	E	G_C2_L4	7201.84	202.031	0.7744	710	710
59	E	G_C0_L3	6255.07	175.472	0.6726	711	711
59	E	G_C2_L0	8453.37	237.14	0.909	712	712
59	E	G_C0_L2	7710.46	216.299	0.8291	713	713
59	E	G_C2_L3	1472.53	41.3084	0.1583	714	714
59	E	G_C2_L1	6593.48	184.965	0.709	715	715
59	E	G_C1_L1	2471.55	69.3337	0.2658	716	716
60	E	G_C0_L0	4888.03	137.122	0.5256	717	717
60	E	G_C2_L0	6979.55	195.795	0.7505	718	718
60	E	G_C2_L2	6415.87	179.982	0.6899	719	719
60	E	G_C1_L2	8561.64	240.177	0.9206	720	720
60	E	G_C2_L3	7365.62	206.625	0.792	721	721
60	E	G_C0_L3	8374.08	234.915	0.9004	722	722
60	E	G_C0_L4	5847.74	164.045	0.6288	723	723
61	E	G_C0_L0	9219.83	258.641	0.9914	724	724
61	E	G_C2_L21	6020.03	168.878	0.6473	725	725
61	E	G_C2_L2	8393.96	235.473	0.9026	726	726
61	E	G_C0_L4	8430.56	236.5	0.9065	727	727
61	E	G_C2_L3	7213.77	202.366	0.7757	728	728
61	E	G_C2_L0	7861.02	220.523	0.8453	729	729
61	E	G_C1_L0	3224.81	90.4647	0.3468	730	730
61	E	G_C2_L4	6565.46	184.179	0.706	731	731
61	E	G_C0_L0	6627.72	185.925	0.7127	732	732
61	E	G_C0_L3	8893.43	249.484	0.9563	733	733
62	E	G_C0_L21	8645.73	242.536	0.9296	734	734
62	E	G_C1_L21	8209.41	230.296	0.8827	735	735
62	E	G_C0_L0	4547.57	127.572	0.489	736	736
62	E	G_C1_L4	8772.44	246.09	0.9433	737	737
62	E	G_C0_L4	5752.24	161.366	0.6185	738	738

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
62	E	G_C0_L1	7043.44	197.587	0.7574	739	739
62	E	G_C1_L3	4847.59	135.988	0.5212	740	740
62	E	G_C0_L0	4949.4	138.844	0.5322	741	741
62	E	G_C0_L2	8950.06	251.073	0.9624	742	742
62	E	G_C2_L0	7942.82	222.817	0.8541	743	743
63	E	G_C0_L21	7995.15	224.286	0.8597	744	744
63	E	G_C0_L0	4158.92	116.669	0.4472	745	745
63	E	G_C1_L1	6930.48	194.419	0.7452	746	746
63	E	G_C2_L3	3956.12	110.98	0.4254	747	747
63	E	G_C2_L1	8954.62	251.201	0.9629	748	748
63	E	G_C2_L4	8568.68	240.375	0.9214	749	749
63	E	G_C1_L0	3759.4	105.461	0.4042	750	750
63	E	G_C1_L4	7339.99	205.906	0.7892	751	751
63	E	G_C0_L3	4954.56	138.989	0.5327	752	752
63	E	G_C0_L2	7984.44	223.985	0.8585	753	753
63	E	D_L_BOT	7951.03	223.048	0.8549	754	754
64	E	G_C2_L21	8545.61	239.727	0.9189	755	755
64	E	G_C1_L0	8685.94	243.664	0.934	756	756
64	E	G_C0_L21	7114.6	199.583	0.765	757	757
64	E	G_C0_L2	6606.55	185.332	0.7104	758	758
64	E	G_C1_L1	6227.52	174.699	0.6696	759	759
64	E	G_C0_L3	3680.1	103.237	0.3957	760	760
64	E	G_C2_L1	6816.68	191.226	0.733	761	761
64	E	G_C2_L3	9240.07	259.209	0.9936	762	762
65	E	G_C0_L0	5418.03	151.99	0.5826	763	763
65	E	G_C2_L21	9146.78	256.592	0.9835	764	764
65	E	G_C1_L21	4896.22	137.352	0.5265	765	765
65	E	G_C2_L0	8561.44	240.171	0.9206	766	766
65	E	G_C2_L3	8448.49	237.003	0.9084	767	767
65	E	G_C1_L4	7765.83	217.852	0.835	768	768
65	E	G_C0_L1	6914.58	193.973	0.7435	769	769
65	E	G_C1_L1	3165.16	88.7912	0.3403	770	770
65	E	G_C1_L3	8795.18	246.728	0.9457	771	771
65	E	G_C2_L1	4730.1	132.692	0.5086	772	772
65	E	G_C1_L2	6742.52	189.146	0.725	773	773
65	E	G_C0_L4	3550.73	99.6074	0.3818	774	774
65	E	G_C2_L0	6803.49	190.856	0.7316	775	775
66	E	G_C2_L0	9226.63	258.832	0.9921	776	776
66	E	G_C1_L0	9233.18	259.015	0.9928	777	777
66	E	G_C0_L3	5563.98	156.084	0.5983	778	778
66	E	G_C2_L3	6789.69	190.469	0.7301	779	779
66	E	G_C0_L0	7667.37	215.09	0.8244	780	780
66	E	G_C2_L2	3710.65	104.094	0.399	781	781
66	E	G_C1_L3	9136.83	256.313	0.9825	782	782
66	E	D_L_BOT	7883.32	221.148	0.8477	783	783
67	E	G_C0_L0	9163.09	257.049	0.9853	784	784
67	E	G_C1_L0	7738.12	217.075	0.8321	785	785
67	E	G_C2_L21	1622.62	45.5189	0.1745	786	786
67	E	G_C0_L2	7865.45	220.647	0.8457	787	787
67	E	G_C1_L3	5075.89	142.392	0.5458	788	788
67	E	G_C2_L4	8230.52	230.888	0.885	789	789
67	E	G_C1_L4	5860.91	164.414	0.6302	790	790
67	E	G_C1_L1	9150.92	256.708	0.984	791	791
68	E	G_C2_L21	8684.31	243.618	0.9338	792	792
68	E	G_C0_L0	6473.29	181.593	0.6961	793	793
68	E	G_C2_L1	4095.46	114.889	0.4404	794	794
68	E	G_C2_L2	9195.79	257.967	0.9888	795	795
68	E	G_C1_L4	5760.74	161.604	0.6194	796	796
68	E	G_C1_L2	8470.98	237.634	0.9109	797	797
68	E	G_C0_L0	8246.38	231.333	0.8867	798	798
68	E	G_C2_L4	7005.6	196.526	0.7533	799	799
68	E	G_C1_L0	5148.3	144.424	0.5536	800	800
68	E	G_C0_L1	5233.8	146.822	0.5628	801	801
68	E	D_L_BOT	8173.94	229.301	0.8789	802	802
69	E	G_C2_L0	6631.41	186.029	0.7131	803	803
69	E	G_C0_L21	8925.15	250.375	0.9597	804	804
69	E	G_C0_L1	9112.34	255.626	0.9798	805	805
69	E	G_C1_L4	3054.87	85.6973	0.3285	806	806

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
69	E	G_C0_L3	7179.82	201.413	0.772	807	807
69	E	G_C0_L0	6800.24	190.765	0.7312	808	808
69	E	G_C1_L3	5519.74	154.844	0.5935	809	809
70	E	G_C2_L0	8076.92	226.579	0.8685	810	810
70	E	G_C1_L0	1104.75	30.9911	0.1188	811	811
70	E	G_C1_L2	6378.41	178.931	0.6859	812	812
70	E	G_C2_L1	6698.28	187.905	0.7202	813	813
70	E	G_C0_L1	9195.72	257.965	0.9888	814	814
70	E	G_C2_L2	8790.29	246.591	0.9452	815	815
70	E	G_C0_L2	4484.08	125.791	0.4822	816	816
70	E	G_C0_L0	6492.12	182.122	0.6981	817	817
70	E	G_C1_L4	3547.76	99.5243	0.3815	818	818
70	E	G_C1_L3	6157.61	172.738	0.6621	819	819
70	E	D_L_BOT	8485.42	238.039	0.9124	820	820
71	E	G_C0_L0	8893.46	249.486	0.9563	821	821
71	E	G_C0_L21	8399.55	235.63	0.9032	822	822
71	E	G_C2_L2	8783.05	246.388	0.9444	823	823
71	E	G_C0_L1	8964.44	251.476	0.9639	824	824
71	E	G_C1_L1	5235.88	146.881	0.563	825	825
71	E	G_C1_L2	6047.46	169.648	0.6503	826	826
71	E	G_C2_L1	4478.07	125.622	0.4815	827	827
71	E	G_C1_L3	8694.07	243.892	0.9348	828	828
71	E	G_C2_L4	3843.75	107.828	0.4133	829	829
71	E	G_C1_L4	8776.15	246.195	0.9437	830	830
71	E	D_R_BOT	9063	254.242	0.9745	831	831
72	E	G_C0_L21	8563.83	240.238	0.9208	832	832
72	E	G_C0_L0	1719.05	48.224	0.1848	833	833
72	E	G_C2_L21	4328.73	121.433	0.4655	834	834
72	E	G_C1_L0	7393.1	207.396	0.795	835	835
72	E	G_C2_L2	7943.8	222.845	0.8542	836	836
72	E	G_C1_L0	6866.62	192.627	0.7383	837	837
72	E	G_C2_L4	6262.33	175.675	0.6734	838	838
72	E	G_C0_L2	4711.2	132.162	0.5066	839	839
72	E	G_C1_L4	7221.37	202.579	0.7765	840	840
72	E	G_C2_L3	5325.64	149.399	0.5726	841	841
73	E	G_C2_L0	5119.02	143.602	0.5504	842	842
73	E	G_C0_L0	5743.61	161.124	0.6176	843	843
73	E	G_C1_L0	1292.95	36.2706	0.139	844	844
73	E	G_C0_L21	6751.45	189.396	0.726	845	845
73	E	G_C1_L1	8593.39	241.068	0.924	846	846
73	E	G_C0_L4	4629.71	129.876	0.4978	847	847
73	E	G_C1_L0	6709.12	188.209	0.7214	848	848
73	E	G_C1_L4	5188.59	145.554	0.5579	849	849
73	E	G_C0_L0	6479.14	181.757	0.6967	850	850
73	E	D_L_BOT	8020.28	224.99	0.8624	851	851
74	E	G_C2_L21	6008.27	168.548	0.6461	852	852
74	E	G_C2_L0	6512.03	182.68	0.7002	853	853
74	E	G_C1_L21	5649.49	158.483	0.6075	854	854
74	E	G_C2_L0	8579.33	240.673	0.9225	855	855
74	E	G_C0_L4	8032.96	225.346	0.8638	856	856
74	E	G_C0_L3	8616.09	241.704	0.9265	857	857
74	E	G_C1_L4	8118.83	227.755	0.873	858	858
74	E	G_C0_L0	9298.71	260.854	0.9999	859	859
74	E	G_C1_L1	8552.38	239.917	0.9196	860	860
74	E	G_C1_L0	5693.51	159.718	0.6122	861	861
75	E	G_C0_L21	8700.97	244.086	0.9356	862	862
75	E	G_C2_L21	5613.98	157.487	0.6037	863	863
75	E	G_C2_L0	6481.35	181.819	0.6969	864	864
75	E	G_C1_L0	4582.41	128.549	0.4927	865	865
75	E	G_C1_L1	8158.91	228.879	0.8773	866	866
75	E	G_C0_L3	6516.31	182.8	0.7007	867	867
75	E	G_C2_L2	7758.15	217.637	0.8342	868	868
75	E	G_C2_L3	4035.42	113.204	0.4339	869	869
75	E	G_C0_L1	7690.09	215.728	0.8269	870	870
75	E	G_C2_L1	6010.33	168.606	0.6463	871	871
75	E	G_C1_L2	6144.15	172.36	0.6607	872	872
75	E	G_C0_L4	3230.29	90.6184	0.3473	873	873
76	E	G_C1_L0	3817.13	107.081	0.4104	874	874

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
76	E	G_C2_L21	3657.1	102.591	0.3932	875	875
76	E	G_C2_L0	7536.62	211.422	0.8104	876	876
76	E	G_C0_L4	7090.97	198.921	0.7625	877	877
76	E	G_C2_L2	7836.53	219.836	0.8426	878	878
76	E	G_C1_L2	2504.04	70.245	0.2693	879	879
76	E	G_C1_L1	5112.15	143.41	0.5497	880	880
76	E	G_C2_L4	6610.36	185.438	0.7108	881	881
76	E	G_C0_L0	5499.02	154.262	0.5913	882	882
76	E	D_R_BOT	7420.14	208.155	0.7979	883	883
77	E	G_C2_L0	8783.33	246.396	0.9444	884	884
77	E	G_C1_L0	4612.22	129.385	0.4959	885	885
77	E	G_C0_L0	7428.83	208.399	0.7988	886	886
77	E	G_C2_L21	8171.2	229.224	0.8786	887	887
77	E	G_C0_L4	9242.57	259.279	0.9938	888	888
77	E	G_C2_L2	5576.22	156.428	0.5996	889	889
77	E	G_C2_L3	9277.27	260.252	0.9976	890	890
77	E	G_C1_L1	6922.7	194.2	0.7444	891	891
77	E	G_C2_L1	6315.33	177.162	0.6791	892	892
77	E	G_C0_L2	5702.23	159.963	0.6131	893	893
77	E	G_C1_L0	5326.34	149.418	0.5727	894	894
77	E	G_C2_L4	8153.7	228.733	0.8767	895	895
77	E	G_C1_L4	6989.07	196.062	0.7515	896	896
77	E	D_R_BOT	4107.29	115.221	0.4416	897	897
78	E	G_C2_L21	7681.03	215.474	0.8259	898	898
78	E	G_C1_L21	7171.98	201.193	0.7712	899	899
78	E	G_C2_L0	7847.15	220.133	0.8438	900	900
78	E	G_C1_L3	8451.42	237.085	0.9088	901	901
78	E	G_C0_L2	6539.28	183.444	0.7031	902	902
78	E	G_C2_L4	4478.68	125.639	0.4816	903	903
78	E	G_C0_L0	8145.56	228.505	0.8759	904	904
78	E	G_C2_L3	8553.74	239.956	0.9198	905	905
78	E	D_R_BOT	6647.18	186.471	0.7148	906	906
79	E	G_C1_L0	6313.31	177.105	0.6789	907	907
79	E	G_C0_L21	7569.85	212.355	0.814	908	908
79	E	G_C0_L0	3336.28	93.5916	0.3587	909	909
79	E	G_C1_L0	8430.57	236.5	0.9065	910	910
79	E	G_C0_L4	9235.93	259.093	0.9931	911	911
79	E	G_C2_L3	7775.72	218.13	0.8361	912	912
79	E	G_C2_L2	7037.37	197.417	0.7567	913	913
79	E	G_C1_L2	8340.05	233.961	0.8968	914	914
80	E	G_C1_L0	2748.23	77.0951	0.2955	915	915
80	E	G_C0_L0	3618.38	101.505	0.3891	916	916
80	E	G_C2_L21	7447.25	208.915	0.8008	917	917
80	E	G_C1_L21	8275.19	232.142	0.8898	918	918
80	E	G_C1_L1	8146.46	228.53	0.876	919	919
80	E	G_C1_L3	8938.04	250.736	0.9611	920	920
80	E	G_C0_L3	8752.32	245.526	0.9411	921	921
80	E	G_C2_L2	5553.04	155.778	0.5971	922	922
80	E	G_C2_L0	7748.76	217.374	0.8332	923	923
80	E	G_C0_L4	8107.16	227.428	0.8717	924	924
80	E	G_C1_L4	6880.22	193.009	0.7398	925	925
80	E	G_C1_L2	7534.79	211.371	0.8102	926	926
80	E	G_C2_L4	3592	100.765	0.3862	927	927
80	E	D_R_BOT	5238.83	146.963	0.5633	928	928
81	E	G_C1_L0	8876.83	249.019	0.9545	929	929
81	E	G_C1_L21	9150.83	256.705	0.984	930	930
81	E	G_C0_L0	6064.35	170.121	0.6521	931	931
81	E	G_C1_L3	7771.37	218.008	0.8356	932	932
81	E	G_C1_L0	6780.75	190.218	0.7291	933	933
81	E	G_C2_L1	8780.79	246.325	0.9442	934	934
81	E	G_C0_L4	5479.7	153.72	0.5892	935	935
81	E	G_C2_L0	5735.91	160.908	0.6168	936	936
81	E	G_C1_L2	8513.5	238.826	0.9154	937	937
81	E	G_C0_L1	7581.08	212.67	0.8152	938	938
81	E	D_L_BOT	7424.01	208.263	0.7983	939	939
82	E	G_C0_L21	9202.27	258.148	0.9895	940	940
82	E	G_C2_L21	5219.4	146.418	0.5612	941	941
82	E	G_C2_L0	3819.98	107.161	0.4108	942	942

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
82	E	G_C1_L0	8256.26	231.61	0.8878	943	943
82	E	G_C2_L1	4208.97	118.073	0.4526	944	944
82	E	G_C1_L2	5197.44	145.802	0.5589	945	945
82	E	G_C0_L2	5372.05	150.701	0.5776	946	946
82	E	D_R_BOT	8913.61	250.051	0.9585	947	947
83	E	G_C0_L0	8865.93	248.713	0.9533	948	948
83	E	G_C1_L21	5968.21	167.424	0.6417	949	949
83	E	G_C0_L21	7477.6	209.767	0.804	950	950
83	E	G_C2_L1	5568.44	156.21	0.5988	951	951
83	E	G_C0_L4	5598.28	157.047	0.602	952	952
83	E	G_C2_L0	8364.71	234.653	0.8994	953	953
83	E	G_C1_L3	3531.77	99.0757	0.3798	954	954
83	E	G_C0_L0	5330.39	149.532	0.5732	955	955
83	E	G_C1_L1	9251.86	259.54	0.9948	956	956
83	E	G_C2_L4	7616.62	213.667	0.819	957	957
83	E	G_C1_L4	7607.14	213.401	0.818	958	958
83	E	G_C1_L0	5624.73	157.789	0.6048	959	959
84	E	G_C1_L0	4318.85	121.155	0.4644	960	960
84	E	G_C0_L0	8595.56	241.129	0.9243	961	961
84	E	G_C2_L21	6645.02	186.411	0.7145	962	962
84	E	G_C2_L0	6212.15	174.267	0.668	963	963
84	E	G_C1_L3	7684.81	215.579	0.8263	964	964
84	E	G_C0_L0	6189.74	173.639	0.6656	965	965
84	E	G_C1_L1	7929.32	222.439	0.8526	966	966
84	E	G_C2_L1	7078.7	198.577	0.7612	967	967
84	E	G_C1_L2	7329.95	205.625	0.7882	968	968
84	E	D_R_BOT	3482.54	97.6946	0.3745	969	969
85	E	G_C2_L0	8711.5	244.381	0.9367	970	970
85	E	G_C1_L21	6269.56	175.878	0.6741	971	971
85	E	G_C1_L0	6606.33	185.325	0.7104	972	972
85	E	G_C2_L0	7412.75	207.948	0.7971	973	973
85	E	G_C2_L3	6787.08	190.396	0.7298	974	974
85	E	G_C2_L1	2372.72	66.5612	0.2551	975	975
85	E	G_C1_L0	8546.73	239.759	0.919	976	976
85	E	G_C2_L2	5288.45	148.355	0.5687	977	977
85	E	G_C1_L3	8560.4	240.142	0.9205	978	978
85	E	G_C2_L4	3922.48	110.036	0.4218	979	979
86	E	G_C2_L21	6088.01	170.785	0.6546	980	980
86	E	G_C0_L0	8984.84	252.049	0.9661	981	981
86	E	G_C0_L21	5435.57	152.482	0.5845	982	982
86	E	G_C1_L4	9265.57	259.924	0.9963	983	983
86	E	G_C1_L3	9064.22	254.276	0.9746	984	984
86	E	G_C2_L0	8980.97	251.94	0.9657	985	985
86	E	G_C2_L2	7517.71	210.892	0.8084	986	986
86	E	G_C1_L0	3579.32	100.409	0.3849	987	987
86	E	G_C1_L2	7603.31	213.293	0.8176	988	988
86	E	G_C0_L2	6265.61	175.767	0.6737	989	989
86	E	D_L_BOT	5772.55	161.935	0.6207	990	990
87	E	G_C2_L0	5997.58	168.248	0.6449	991	991
87	E	G_C2_L21	5777.41	162.072	0.6212	992	992
87	E	G_C0_L0	9200.06	258.086	0.9893	993	993
87	E	G_C2_L3	5358.28	150.314	0.5762	994	994
87	E	G_C1_L2	4891.78	137.227	0.526	995	995
87	E	G_C2_L1	8044.09	225.659	0.865	996	996
87	E	G_C1_L1	6447.02	180.856	0.6932	997	997
87	E	G_C1_L4	830.128	23.2873	0.0893	998	998
87	E	G_C0_L0	7478.51	209.792	0.8041	999	999
87	E	G_C2_L0	7950.47	223.032	0.8549	1000	1000
87	E	G_C2_L4	5008.55	140.503	0.5386	1001	1001
87	E	D_R_BOT	8185.59	229.628	0.8802	1002	1002
88	E	G_C1_L21	190.951	5.3567	0.0205	1003	1003
88	E	G_C2_L21	5173.64	145.134	0.5563	1004	1004
88	E	G_C0_L21	7993.8	224.248	0.8595	1005	1005
88	E	G_C2_L0	8554.21	239.969	0.9198	1006	1006
88	E	G_C2_L3	7671.99	215.22	0.8249	1007	1007
88	E	G_C2_L1	8178.7	229.435	0.8794	1008	1008
88	E	G_C1_L4	6170.46	173.098	0.6635	1009	1009
88	E	G_C0_L2	3722.05	104.413	0.4002	1010	1010

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
88	E	G_C1_L1	9078.76	254.684	0.9762	1011	1011
88	E	G_C1_L3	7251.95	203.437	0.7798	1012	1012
88	E	G_C2_L0	3695.74	103.676	0.3974	1013	1013
89	E	G_C0_L21	9104.58	255.408	0.979	1014	1014
89	E	G_C2_L0	8496.18	238.341	0.9136	1015	1015
89	E	G_C0_L3	6879.36	192.985	0.7397	1016	1016
89	E	G_C0_L0	5945.49	166.787	0.6393	1017	1017
89	E	G_C2_L0	8523.75	239.114	0.9165	1018	1018
89	E	G_C1_L1	8877.26	249.031	0.9545	1019	1019
89	E	G_C1_L0	7930.7	222.477	0.8528	1020	1020
89	E	G_C2_L3	5710.91	160.206	0.6141	1021	1021
89	E	G_C1_L2	7357.38	206.394	0.7911	1022	1022
89	E	G_C0_L2	8509.74	238.721	0.915	1023	1023
89	E	D_R_BOT	7789.99	218.53	0.8376	1024	1024
90	E	G_C0_L21	9132.17	256.182	0.982	1025	1025
90	E	G_C1_L0	7249.38	203.364	0.7795	1026	1026
90	E	G_C2_L0	7297.15	204.705	0.7846	1027	1027
90	E	G_C1_L3	799.798	22.4365	0.086	1028	1028
90	E	G_C0_L2	3215.8	90.212	0.3458	1029	1029
90	E	G_C2_L4	8003.29	224.514	0.8606	1030	1030
90	E	G_C1_L4	7383.01	207.113	0.7939	1031	1031
90	E	G_C1_L1	5414.6	151.894	0.5822	1032	1032
90	E	G_C1_L0	5241.89	147.049	0.5636	1033	1033
90	E	G_C1_L2	8149.06	228.603	0.8762	1034	1034
90	E	G_C2_L1	7859.52	220.481	0.8451	1035	1035
91	E	G_C1_L21	7779.97	218.249	0.8366	1036	1036
91	E	G_C1_L0	6433.09	180.466	0.6917	1037	1037
91	E	G_C2_L0	3294.93	92.4316	0.3543	1038	1038
91	E	G_C2_L4	8525.07	239.151	0.9167	1039	1039
91	E	G_C2_L0	4453.46	124.931	0.4789	1040	1040
91	E	G_C0_L3	5406.9	151.678	0.5814	1041	1041
91	E	G_C1_L4	6470.16	181.506	0.6957	1042	1042
91	E	G_C0_L2	8254.6	231.564	0.8876	1043	1043
91	E	G_C0_L0	6458.12	181.168	0.6944	1044	1044
91	E	G_C0_L4	7126.71	199.923	0.7663	1045	1045
91	E	G_C2_L3	8809.65	247.134	0.9473	1046	1046
92	E	G_C1_L0	7632.26	214.106	0.8207	1047	1047
92	E	G_C2_L0	7445.08	208.855	0.8005	1048	1048
92	E	G_C0_L3	7628.73	214.006	0.8203	1049	1049
92	E	G_C1_L0	7430.19	208.437	0.7989	1050	1050
92	E	G_C0_L2	7672.25	215.227	0.825	1051	1051
92	E	G_C2_L4	6281.25	176.206	0.6754	1052	1052
92	E	G_C1_L3	4043.29	113.425	0.4348	1053	1053
92	E	D_L_BOT	6842.71	191.957	0.7358	1054	1054
93	E	G_C1_L0	9125.42	255.993	0.9812	1055	1055
93	E	G_C0_L21	7136.27	200.192	0.7673	1056	1056
93	E	G_C2_L0	7018.02	196.874	0.7546	1057	1057
93	E	G_C2_L1	5612.71	157.452	0.6035	1058	1058
93	E	G_C0_L2	6391.57	179.301	0.6873	1059	1059
93	E	G_C1_L4	7765.42	217.841	0.835	1060	1060
93	E	G_C2_L2	6813.26	191.13	0.7326	1061	1061
93	E	G_C1_L1	3969.28	111.349	0.4268	1062	1062
93	E	G_C1_L0	5502.55	154.361	0.5917	1063	1063
93	E	G_C0_L0	3592.26	100.772	0.3863	1064	1064
94	E	G_C2_L21	8228.57	230.833	0.8848	1065	1065
94	E	G_C1_L21	7295.98	204.672	0.7845	1066	1066
94	E	G_C0_L0	9243.63	259.309	0.9939	1067	1067
94	E	G_C2_L3	2737.16	76.7846	0.2943	1068	1068
94	E	G_C0_L3	7986.36	224.039	0.8587	1069	1069
94	E	G_C1_L1	8472.3	237.671	0.911	1070	1070
94	E	G_C0_L1	4436.24	124.448	0.477	1071	1071
94	E	G_C1_L2	5826.3	163.443	0.6265	1072	1072
94	E	G_C1_L4	9173.26	257.335	0.9864	1073	1073
94	E	G_C0_L0	5620.52	157.671	0.6044	1074	1074
94	E	G_C0_L2	8347.24	234.163	0.8976	1075	1075
94	E	D_R_BOT	5998.85	168.284	0.645	1076	1076
95	E	G_C1_L0	7602.7	213.276	0.8175	1077	1077
95	E	G_C1_L21	8199.86	230.028	0.8817	1078	1078

Iteration_I D	Hazard_Zo ne	Component _ID	Applied_EX_ MPa	Applied_ke_N _mm	Damage_Facto r_D	Dynamic_MA T_ID	Dynamic_REA L_ID
95	E	G_C0_L0	9139.95	256.4	0.9828	1079	1079
95	E	G_C0_L2	9214.02	258.478	0.9908	1080	1080
95	E	G_C2_L4	7045.78	197.653	0.7576	1081	1081
95	E	G_C0_L4	6191.82	173.697	0.6658	1082	1082
95	E	G_C1_L3	2604.3	73.0576	0.28	1083	1083
95	E	G_C1_L4	2474.17	69.4071	0.266	1084	1084
95	E	G_C1_L2	7664.77	215.017	0.8242	1085	1085
95	E	G_C1_L0	7374.09	206.863	0.7929	1086	1086
95	E	G_C2_L2	7733.24	216.938	0.8315	1087	1087
96	E	G_C1_L0	7602.57	213.273	0.8175	1088	1088
96	E	G_C0_L0	8400.73	235.663	0.9033	1089	1089
96	E	G_C1_L1	7873.52	220.873	0.8466	1090	1090
96	E	G_C0_L2	4549.58	127.628	0.4892	1091	1091
96	E	G_C1_L3	6082.69	170.636	0.6541	1092	1092
96	E	G_C2_L4	8074.48	226.511	0.8682	1093	1093
96	E	G_C0_L0	8125.48	227.941	0.8737	1094	1094
96	E	G_C1_L0	8130.53	228.083	0.8743	1095	1095
96	E	G_C1_L2	4796.17	134.545	0.5157	1096	1096
96	E	G_C2_L3	2204.21	61.834	0.237	1097	1097
96	E	D_L_BOT	6128.11	171.91	0.6589	1098	1098
97	E	G_C0_L21	1862.54	52.2493	0.2003	1099	1099
97	E	G_C2_L21	7758.9	217.658	0.8343	1100	1100
97	E	G_C1_L3	5986.14	167.927	0.6437	1101	1101
97	E	G_C2_L3	5938.6	166.594	0.6386	1102	1102
97	E	G_C2_L1	5586.53	156.717	0.6007	1103	1103
97	E	G_C0_L1	7040.11	197.494	0.757	1104	1104
97	E	G_C2_L0	6653.77	186.656	0.7155	1105	1105
97	E	G_C1_L0	6486	181.95	0.6974	1106	1106
98	E	G_C0_L0	7357.75	206.405	0.7912	1107	1107
98	E	G_C1_L21	7372.75	206.825	0.7928	1108	1108
98	E	G_C2_L0	5590.23	156.821	0.6011	1109	1109
98	E	G_C1_L0	2347.48	65.8531	0.2524	1110	1110
98	E	G_C2_L4	7248.13	203.329	0.7794	1111	1111
98	E	G_C0_L0	7686.06	215.615	0.8265	1112	1112
98	E	G_C2_L2	8011.46	224.743	0.8614	1113	1113
98	E	G_C1_L2	6256.98	175.525	0.6728	1114	1114
98	E	D_R_BOT	7698.7	215.969	0.8278	1115	1115
99	E	G_C0_L21	7639.36	214.305	0.8214	1116	1116
99	E	G_C0_L0	8311.87	233.17	0.8937	1117	1117
99	E	G_C1_L0	7075.05	198.474	0.7608	1118	1118
99	E	G_C1_L0	8674.57	243.345	0.9327	1119	1119
99	E	G_C2_L0	3939.69	110.519	0.4236	1120	1120
99	E	G_C0_L2	1289.48	36.1735	0.1387	1121	1121
99	E	G_C0_L0	6651.72	186.599	0.7152	1122	1122
99	E	G_C1_L2	8709.39	244.322	0.9365	1123	1123
99	E	D_L_BOT	6728.09	188.741	0.7235	1124	1124
100	E	G_C1_L0	7324.87	205.482	0.7876	1125	1125
100	E	G_C2_L0	3910.49	109.7	0.4205	1126	1126
100	E	G_C1_L3	5665.48	158.932	0.6092	1127	1127
100	E	G_C2_L4	6068.16	170.228	0.6525	1128	1128
100	E	G_C0_L1	8881.58	249.152	0.955	1129	1129
100	E	G_C0_L2	8339.54	233.946	0.8967	1130	1130
100	E	G_C2_L2	6084.96	170.7	0.6543	1131	1131
100	E	G_C2_L1	6156.41	172.704	0.662	1132	1132
100	E	G_C0_L4	8881.6	249.153	0.955	1133	1133
100	E	G_C1_L0	8510.23	238.735	0.9151	1134	1134
100	E	G_C1_L2	7536.56	211.421	0.8104	1135	1135

C.2.4 zone_element_list.csv

Hazard_Zone	CM_Name	Element_ID
A	G_C0_L0	1
A	G_C1_L0	23
A	G_C2_L0	45
A	G_C0_L21	22
A	G_C1_L21	44

Hazard_Zone	CM_Name	Element_ID
A	G_C2_L21	66
B	G_C0_L0	1
B	G_C0_L1	2
B	G_C0_L2	3
B	G_C0_L3	4
B	G_C0_L4	5
B	G_C1_L0	23
B	G_C1_L1	24
B	G_C1_L2	25
B	G_C1_L3	26
B	G_C1_L4	27
B	G_C2_L0	45
B	G_C2_L1	46
B	G_C2_L2	47
B	G_C2_L3	48
B	G_C2_L4	49
C	D_L_BOT	69
C	D_R_BOT	72
D	L_F_1	77
D	L_F_1	78
D	L_F_2	81
D	L_F_2	82
D	L_F_3	85
D	L_F_3	86
D	L_F_4	89
D	L_F_4	90
D	L_F_5	93
D	L_F_5	94
D	L_B_1	79
D	L_B_1	80
D	L_B_2	83
D	L_B_2	84
D	L_B_3	87
D	L_B_3	88
D	L_B_4	91
D	L_B_4	92
D	L_B_5	95
D	L_B_5	96