```
//Exported using: GeniE V7.9-04 started 12-Aug-2019 18:06:57
//Units
GenieRules.Units.setOutputUnits("m", "kN", "delC");
GenieRules.Units.setInputUnit(Angle, "deg");
GenieRules.Units.setInputUnit(Force, "kN");
GenieRules.Units.setInputUnit(Length, "m");
GenieRules.Units.setInputUnit(TempDiff, "delC");

//***** PROPERTIES *****//
//Sections
AutoCone = ConeSection(1, true);
Cono = ConeSection(0.5, true);
H400x20 = ISection(0.4 m, 0.2 m, 0.01 m, 0.02 m);
H490x250 = ISection(0.49 m, 0.25 m, 0.01 m, 0.02 m);
// NVS lib : HE 1000 A NS-EN 10034
HE1000A = ISection(0.99 m, 0.3 m, 0.0165 m, 0.031 m);
HE1000A.description = "NVS lib : HE 1000 A NS-EN 10034";
// NVS lib : HE 1000 B NS-EN 10034
HE1000B = ISection(1 m, 0.3 m, 0.019 m, 0.036 m);
HE1000B.description = "NVS lib : HE 1000 B NS-EN 10034";
// NVS lib : HE 1000 M NS-EN 10034/DIN 1025-4
HE1000M = ISection(1.008 m, 0.302 m, 0.021 m, 0.04 m);
HE1000M.description = "NVS lib : HE 1000 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 100 A NS-EN 10034
HE100A = ISection(0.096 m, 0.1 m, 0.005 m, 0.008 m);
HE100A.description = "NVS lib : HE 100 A NS-EN 10034";
// NVS lib : HE 100 B NS-EN 10034
HE100B = ISection(0.1 m, 0.1 m, 0.006 m, 0.01 m);
HE100B.description = "NVS lib : HE 100 B NS-EN 10034";
// NVS lib : HE 100 M NS-EN 10034/DIN 1025-4
HE100M = ISection(0.12 m, 0.106 m, 0.012 m, 0.02 m);
HE100M.description = "NVS lib : HE 100 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 120 A NS-EN 10034
HE120A = ISection(0.114 m, 0.12 m, 0.005 m, 0.008 m);
HE120A.description = "NVS lib : HE 120 A NS-EN 10034";
// NVS lib : HE 120 B NS-EN 10034
HE120B = ISection(0.12 m, 0.12 m, 0.0065 m, 0.011 m);
HE120B.description = "NVS lib : HE 120 B NS-EN 10034";
// NVS lib : HE 120 M NS-EN 10034/DIN 1025-4
HE120M = ISection(0.14 m, 0.126 m, 0.0125 m, 0.021 m);
HE120M.description = "NVS lib : HE 120 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 140 A NS-EN 10034
HE140A = ISection(0.133 m, 0.14 m, 0.0055 m, 0.0085 m);
HE140A.description = "NVS lib : HE 140 A NS-EN 10034";
// NVS lib : HE 140 B NS-EN 10034
HE140B = ISection(0.14 m, 0.14 m, 0.007 m, 0.012 m);
HE140B.description = "NVS lib : HE 140 B NS-EN 10034";
// NVS lib : HE 140 M NS-EN 10034/DIN 1025-4
HE140M = ISection(0.16 m, 0.146 m, 0.013 m, 0.022 m);
HE140M.description = "NVS lib : HE 140 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 160 A NS-EN 10034
HE160A = ISection(0.152 m, 0.16 m, 0.006 m, 0.009 m);
HE160A.description = "NVS lib : HE 160 A NS-EN 10034";
// NVS lib : HE 160 B NS-EN 10034
HE160B = ISection(0.16 m, 0.16 m, 0.008 m, 0.013 m);
HE160B.description = "NVS lib : HE 160 B NS-EN 10034";
// NVS lib : HE 160 M NS-EN 10034/DIN 1025-4
HE160M = ISection(0.18 m, 0.166 m, 0.014 m, 0.023 m);
HE160M.description = "NVS lib : HE 160 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 180 A NS-EN 10034
HE180A = ISection(0.171 m, 0.18 m, 0.006 m, 0.0095 m);
HE180A.description = "NVS lib : HE 180 A NS-EN 10034";
// NVS lib : HE 180 B NS-EN 10034
HE180B = ISection(0.18 m, 0.18 m, 0.0085 m, 0.014 m);
HE180B.description = "NVS lib : HE 180 B NS-EN 10034";
// NVS lib : HE 180 M NS-EN 10034/DIN 1025-4
HE180M = ISection(0.2 m, 0.186 m, 0.0145 m, 0.024 m);
HE180M.description = "NVS lib : HE 180 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 200 A NS-EN 10034
HE200A = ISection(0.19 m, 0.2 m, 0.0065 m, 0.01 m);
HE200A.description = "NVS lib : HE 200 A NS-EN 10034";
// NVS lib : HE 200 B NS-EN 10034
HE200B = ISection(0.2 m, 0.2 m, 0.009 m, 0.015 m);
HE200B.description = "NVS lib : HE 200 B NS-EN 10034";
// NVS lib : HE 200 M NS-EN 10034/DIN 1025-4
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HE200M = ISection(0.22 m, 0.206 m, 0.015 m, 0.025 m);
HE200M.description = "NVS lib : HE 200 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 220 A NS-EN 10034
HE220A = ISection(0.21 m, 0.22 m, 0.007 m, 0.011 m);
HE220A.description = "NVS lib : HE 220 A NS-EN 10034";
// NVS lib : HE 220 B NS-EN 10034
HE220B = ISection(0.22 m, 0.22 m, 0.0095 m, 0.016 m);
HE220B.description = "NVS lib : HE 220 B NS-EN 10034";
// NVS lib : HE 220 M NS-EN 10034/DIN 1025-4
HE220M = ISection(0.24 m, 0.226 m, 0.0155 m, 0.026 m);
HE220M.description = "NVS lib : HE 220 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 240 A NS-EN 10034
HE240A = ISection(0.23 m, 0.24 m, 0.0075 m, 0.012 m);
HE240A.description = "NVS lib : HE 240 A NS-EN 10034";
// NVS lib : HE 240 B NS-EN 10034
HE240B = ISection(0.24 m, 0.24 m, 0.01 m, 0.017 m);
HE240B.description = "NVS lib : HE 240 B NS-EN 10034";
// NVS lib : HE 240 M NS-EN 10034/DIN 1025-4
HE240M = ISection(0.27 m, 0.248 m, 0.018 m, 0.032 m);
HE240M.description = "NVS lib : HE 240 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 260 A NS-EN 10034
HE260A = ISection(0.25 m, 0.26 m, 0.0075 m, 0.0125 m);
HE260A.description = "NVS lib : HE 260 A NS-EN 10034";
// NVS lib : HE 260 B NS-EN 10034
HE260B = ISection(0.26 m, 0.26 m, 0.01 m, 0.0175 m);
HE260B.description = "NVS lib : HE 260 B NS-EN 10034";
// NVS lib : HE 260 M NS-EN 10034/DIN 1025-4
HE260M = ISection(0.29 m, 0.268 m, 0.018 m, 0.0325 m);
HE260M.description = "NVS lib : HE 260 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 280 A NS-EN 10034
HE280A = ISection(0.27 m, 0.28 m, 0.008 m, 0.013 m);
HE280A.description = "NVS lib : HE 280 A NS-EN 10034";
// NVS lib : HE 280 B NS-EN 10034
HE280B = ISection(0.28 m, 0.28 m, 0.0105 m, 0.018 m);
HE280B.description = "NVS lib : HE 280 B NS-EN 10034";
// NVS lib : HE 280 M NS-EN 10034/DIN 1025-4
HE280M = ISection(0.31 m, 0.288 m, 0.0185 m, 0.033 m);
HE280M.description = "NVS lib : HE 280 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 300 A NS-EN 10034
HE300A = ISection(0.29 m, 0.3 m, 0.0085 m, 0.014 m);
HE300A.description = "NVS lib : HE 300 A NS-EN 10034";
// NVS lib : HE 300 B NS-EN 10034
HE300B = ISection(0.3 m, 0.3 m, 0.011 m, 0.019 m);
HE300B.description = "NVS lib : HE 300 B NS-EN 10034";
// NVS lib : HE 300 C NS-EN 10034/DIN 1025-4
HE300C = ISection(0.32 m, 0.305 m, 0.016 m, 0.029 m);
HE300C.description = "NVS lib : HE 300 C NS-EN 10034/DIN 1025-4";
// NVS lib : HE 300 M NS-EN 10034/DIN 1025-4
HE300M = ISection(0.34 m, 0.31 m, 0.021 m, 0.039 m);
HE300M.description = "NVS lib : HE 300 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 320 A NS-EN 10034
HE320A = ISection(0.31 m, 0.3 m, 0.009 m, 0.0155 m);
HE320A.description = "NVS lib : HE 320 A NS-EN 10034";
// NVS lib : HE 320 B NS-EN 10034
HE320B = ISection(0.32 m, 0.3 m, 0.0115 m, 0.0205 m);
HE320B.description = "NVS lib : HE 320 B NS-EN 10034";
// NVS lib : HE 320 M NS-EN 10034/DIN 1025-4
HE320M = ISection(0.359 m, 0.309 m, 0.021 m, 0.04 m);
HE320M.description = "NVS lib : HE 320 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 340 A NS-EN 10034
HE340A = ISection(0.33 m, 0.3 m, 0.0095 m, 0.0165 m);
HE340A.description = "NVS lib : HE 340 A NS-EN 10034";
// NVS lib : HE 340 B NS-EN 10034
HE340B = ISection(0.34 m, 0.3 m, 0.012 m, 0.0215 m);
HE340B.description = "NVS lib : HE 340 B NS-EN 10034";
// NVS lib : HE 340 M NS-EN 10034/DIN 1025-4
HE340M = ISection(0.377 m, 0.309 m, 0.021 m, 0.04 m);
HE340M.description = "NVS lib : HE 340 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 360 A NS-EN 10034
HE360A = ISection(0.35 m, 0.3 m, 0.01 m, 0.0175 m);
HE360A.description = "NVS lib : HE 360 A NS-EN 10034";
// NVS lib : HE 360 B NS-EN 10034
HE360B = ISection(0.36 m, 0.3 m, 0.0125 m, 0.0225 m);
HE360B.description = "NVS lib : HE 360 B NS-EN 10034";
// NVS lib : HE 360 M NS-EN 10034/DIN 1025-4
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HE360M = ISection(0.395 m, 0.308 m, 0.021 m, 0.04 m);
HE360M.description = "NVS lib : HE 360 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 400 A NS-EN 10034
HE400A = ISection(0.39 m, 0.3 m, 0.011 m, 0.019 m);
HE400A.description = "NVS lib : HE 400 A NS-EN 10034";
// NVS lib : HE 400 B NS-EN 10034
HE400B = ISection(0.4 m, 0.3 m, 0.0135 m, 0.024 m);
HE400B.description = "NVS lib : HE 400 B NS-EN 10034";
// NVS lib : HE 400 M NS-EN 10034/DIN 1025-4
HE400M = ISection(0.432 m, 0.307 m, 0.021 m, 0.04 m);
HE400M.description = "NVS lib : HE 400 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 450 A NS-EN 10034
HE450A = ISection(0.44 m, 0.3 m, 0.0115 m, 0.021 m);
HE450A.description = "NVS lib : HE 450 A NS-EN 10034";
// NVS lib : HE 450 B NS-EN 10034
HE450B = ISection(0.45 m, 0.3 m, 0.014 m, 0.026 m);
HE450B.description = "NVS lib : HE 450 B NS-EN 10034";
// NVS lib : HE 450 M NS-EN 10034/DIN 1025-4
HE450M = ISection(0.478 m, 0.307 m, 0.021 m, 0.04 m);
HE450M.description = "NVS lib : HE 450 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 500 A NS-EN 10034
HE500A = ISection(0.49 m, 0.3 m, 0.012 m, 0.023 m);
HE500A.description = "NVS lib : HE 500 A NS-EN 10034";
// NVS lib : HE 500 B NS-EN 10034
HE500B = ISection(0.5 m, 0.3 m, 0.0145 m, 0.028 m);
HE500B.description = "NVS lib : HE 500 B NS-EN 10034";
// NVS lib : HE 500 M NS-EN 10034/DIN 1025-4
HE500M = ISection(0.524 m, 0.306 m, 0.021 m, 0.04 m);
HE500M.description = "NVS lib : HE 500 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 550 A NS-EN 10034
HE550A = ISection(0.54 m, 0.3 m, 0.0125 m, 0.024 m);
HE550A.description = "NVS lib : HE 550 A NS-EN 10034";
// NVS lib : HE 550 B NS-EN 10034
HE550B = ISection(0.55 m, 0.3 m, 0.015 m, 0.029 m);
HE550B.description = "NVS lib : HE 550 B NS-EN 10034";
// NVS lib : HE 550 M NS-EN 10034/DIN 1025-4
HE550M = ISection(0.572 m, 0.306 m, 0.021 m, 0.04 m);
HE550M.description = "NVS lib : HE 550 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 600 A NS-EN 10034
HE600A = ISection(0.59 m, 0.3 m, 0.013 m, 0.025 m);
HE600A.description = "NVS lib : HE 600 A NS-EN 10034";
// NVS lib : HE 600 B NS-EN 10034
HE600B = ISection(0.6 m, 0.3 m, 0.0155 m, 0.03 m);
HE600B.description = "NVS lib : HE 600 B NS-EN 10034";
// NVS lib : HE 600 M NS-EN 10034/DIN 1025-4
HE600M = ISection(0.62 m, 0.305 m, 0.021 m, 0.04 m);
HE600M.description = "NVS lib : HE 600 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 650 A NS-EN 10034
HE650A = ISection(0.64 m, 0.3 m, 0.0135 m, 0.026 m);
HE650A.description = "NVS lib : HE 650 A NS-EN 10034";
// NVS lib : HE 650 B NS-EN 10034
HE650B = ISection(0.65 m, 0.3 m, 0.016 m, 0.031 m);
HE650B.description = "NVS lib : HE 650 B NS-EN 10034";
// NVS lib : HE 650 M NS-EN 10034/DIN 1025-4
HE650M = ISection(0.668 m, 0.305 m, 0.021 m, 0.04 m);
HE650M.description = "NVS lib : HE 650 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 700 A NS-EN 10034
HE700A = ISection(0.69 m, 0.3 m, 0.0145 m, 0.027 m);
HE700A.description = "NVS lib : HE 700 A NS-EN 10034";
// NVS lib : HE 700 B NS-EN 10034
HE700B = ISection(0.7 m, 0.3 m, 0.017 m, 0.032 m);
HE700B.description = "NVS lib : HE 700 B NS-EN 10034";
// NVS lib : HE 700 M NS-EN 10034/DIN 1025-4
HE700M = ISection(0.716 m, 0.304 m, 0.021 m, 0.04 m);
HE700M.description = "NVS lib : HE 700 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 800 A NS-EN 10034
HE800A = ISection(0.79 m, 0.3 m, 0.015 m, 0.028 m);
HE800A.description = "NVS lib : HE 800 A NS-EN 10034";
// NVS lib : HE 800 B NS-EN 10034
HE800B = ISection(0.8 m, 0.3 m, 0.0175 m, 0.033 m);
HE800B.description = "NVS lib : HE 800 B NS-EN 10034";
// NVS lib : HE 800 M NS-EN 10034/DIN 1025-4
HE800M = ISection(0.814 m, 0.303 m, 0.021 m, 0.04 m);
HE800M.description = "NVS lib : HE 800 M NS-EN 10034/DIN 1025-4";
// NVS lib : HE 900 A NS-EN 10034
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HE900A = ISection(0.89 m, 0.3 m, 0.016 m, 0.03 m);
HE900A.description = "NVS lib : HE 900 A NS-EN 10034";
// NVS lib : HE 900 B NS-EN 10034
HE900B = ISection(0.9 m, 0.3 m, 0.0185 m, 0.035 m);
HE900B.description = "NVS lib : HE 900 B NS-EN 10034";
// NVS lib : HE 900 M NS-EN 10034/DIN 1025-4
HE900M = ISection(0.91 m, 0.302 m, 0.021 m, 0.04 m);
HE900M.description = "NVS lib : HE 900 M NS-EN 10034/DIN 1025-4";
// NVS lib : INP 100 NS-EN 10024/DIN 1025-1
INP100 = ISection(0.1 m, 0.05 m, 0.0045 m, 0.0068 m);
INP100.description = "NVS lib : INP 100 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 120 NS-EN 10024/DIN 1025-1
INP120 = ISection(0.12 m, 0.058 m, 0.0051 m, 0.0077 m);
INP120.description = "NVS lib : INP 120 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 140 NS-EN 10024/DIN 1025-1
INP140 = ISection(0.14 m, 0.066 m, 0.0057 m, 0.0086 m);
INP140.description = "NVS lib : INP 140 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 160 NS-EN 10024/DIN 1025-1
INP160 = ISection(0.16 m, 0.074 m, 0.0063 m, 0.0095 m);
INP160.description = "NVS lib : INP 160 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 180 NS-EN 10024/DIN 1025-1
INP180 = ISection(0.18 m, 0.082 m, 0.0069 m, 0.0104 m);
INP180.description = "NVS lib : INP 180 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 200 NS-EN 10024/DIN 1025-1
INP200 = ISection(0.2 m, 0.09 m, 0.0075 m, 0.0113 m);
INP200.description = "NVS lib : INP 200 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 220 NS-EN 10024/DIN 1025-1
INP220 = ISection(0.22 m, 0.098 m, 0.0081 m, 0.0122 m);
INP220.description = "NVS lib : INP 220 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 240 NS-EN 10024/DIN 1025-1
INP240 = ISection(0.24 m, 0.106 m, 0.0087 m, 0.0131 m);
INP240.description = "NVS lib : INP 240 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 260 NS-EN 10024/DIN 1025-1
INP260 = ISection(0.26 m, 0.113 m, 0.0094 m, 0.0141 m);
INP260.description = "NVS lib : INP 260 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 280 NS-EN 10024/DIN 1025-1
INP280 = ISection(0.28 m, 0.119 m, 0.0101 m, 0.0152 m);
INP280.description = "NVS lib : INP 280 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 300 NS-EN 10024/DIN 1025-1
INP300 = ISection(0.3 m, 0.125 m, 0.0108 m, 0.0162 m);
INP300.description = "NVS lib : INP 300 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 320 NS-EN 10024/DIN 1025-1
INP320 = ISection(0.32 m, 0.131 m, 0.0115 m, 0.0173 m);
INP320.description = "NVS lib : INP 320 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 340 NS-EN 10024/DIN 1025-1
INP340 = ISection(0.34 m, 0.137 m, 0.0122 m, 0.0183 m);
INP340.description = "NVS lib : INP 340 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 360 NS-EN 10024/DIN 1025-1
INP360 = ISection(0.36 m, 0.143 m, 0.013 m, 0.0195 m);
INP360.description = "NVS lib : INP 360 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 380 NS-EN 10024/DIN 1025-1
INP380 = ISection(0.38 m, 0.149 m, 0.0137 m, 0.0205 m);
INP380.description = "NVS lib : INP 380 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 400 NS-EN 10024/DIN 1025-1
INP400 = ISection(0.4 m, 0.155 m, 0.0144 m, 0.0216 m);
INP400.description = "NVS lib : INP 400 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 450 NS-EN 10024/DIN 1025-1
INP450 = ISection(0.45 m, 0.17 m, 0.0162 m, 0.0243 m);
INP450.description = "NVS lib : INP 450 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 500 NS-EN 10024/DIN 1025-1
INP500 = ISection(0.5 m, 0.185 m, 0.018 m, 0.027 m);
INP500.description = "NVS lib : INP 500 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 550 NS-EN 10024/DIN 1025-1
INP550 = ISection(0.55 m, 0.2 m, 0.019 m, 0.03 m);
INP550.description = "NVS lib : INP 550 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 600 NS-EN 10024/DIN 1025-1
INP600 = ISection(0.6 m, 0.215 m, 0.0216 m, 0.0324 m);
INP600.description = "NVS lib : INP 600 NS-EN 10024/DIN 1025-1";
// NVS lib : INP 80 NS-EN 10024/DIN 1025-1
INP80 = ISection(0.08 m, 0.042 m, 0.0039 m, 0.0059 m);
INP80.description = "NVS lib : INP 80 NS-EN 10024/DIN 1025-1";
// NVS lib : IPE 100 NS-EN 10034
IPE100 = ISection(0.1 m, 0.055 m, 0.0041 m, 0.0057 m);
IPE100.description = "NVS lib : IPE 100 NS-EN 10034";
// NVS lib : IPE 120 NS-EN 10034
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IPE120 = ISection(0.12 m, 0.064 m, 0.0044 m, 0.0063 m);
IPE120.description = "NVS lib : IPE 120 NS-EN 10034";
// NVS lib : IPE 140 NS-EN 10034
IPE140 = ISection(0.14 m, 0.073 m, 0.0047 m, 0.0069 m);
IPE140.description = "NVS lib : IPE 140 NS-EN 10034";
// NVS lib : IPE 160 NS-EN 10034
IPE160 = ISection(0.16 m, 0.082 m, 0.005 m, 0.0074 m);
IPE160.description = "NVS lib : IPE 160 NS-EN 10034";
// NVS lib : IPE 180 NS-EN 10034
IPE180 = ISection(0.18 m, 0.091 m, 0.0053 m, 0.008 m);
IPE180.description = "NVS lib : IPE 180 NS-EN 10034";
// NVS lib : IPE 200 NS-EN 10034
IPE200 = ISection(0.2 m, 0.1 m, 0.0056 m, 0.0085 m);
IPE200.description = "NVS lib : IPE 200 NS-EN 10034";
// NVS lib : IPE 220 NS-EN 10034
IPE220 = ISection(0.22 m, 0.11 m, 0.0059 m, 0.0092 m);
IPE220.description = "NVS lib : IPE 220 NS-EN 10034";
// NVS lib : IPE 240 NS-EN 10034
IPE240 = ISection(0.24 m, 0.12 m, 0.0062 m, 0.0098 m);
IPE240.description = "NVS lib : IPE 240 NS-EN 10034";
// NVS lib : IPE 270 NS-EN 10034
IPE270 = ISection(0.27 m, 0.135 m, 0.0066 m, 0.0102 m);
IPE270.description = "NVS lib : IPE 270 NS-EN 10034";
// NVS lib : IPE 300 NS-EN 10034
IPE300 = ISection(0.3 m, 0.15 m, 0.0071 m, 0.0107 m);
IPE300.description = "NVS lib : IPE 300 NS-EN 10034";
// NVS lib : IPE 330 NS-EN 10034
IPE330 = ISection(0.33 m, 0.16 m, 0.0075 m, 0.0115 m);
IPE330.description = "NVS lib : IPE 330 NS-EN 10034";
// NVS lib : IPE 360 NS-EN 10034
IPE360 = ISection(0.36 m, 0.17 m, 0.008 m, 0.0127 m);
IPE360.description = "NVS lib : IPE 360 NS-EN 10034";
// NVS lib : IPE 400 NS-EN 10034
IPE400 = ISection(0.4 m, 0.18 m, 0.0086 m, 0.0135 m);
IPE400.description = "NVS lib : IPE 400 NS-EN 10034";
// NVS lib : IPE 450 NS-EN 10034
IPE450 = ISection(0.45 m, 0.19 m, 0.0094 m, 0.0146 m);
IPE450.description = "NVS lib : IPE 450 NS-EN 10034";
// NVS lib : IPE 500 NS-EN 10034
IPE500 = ISection(0.5 m, 0.2 m, 0.0102 m, 0.016 m);
IPE500.description = "NVS lib : IPE 500 NS-EN 10034";
// NVS lib : IPE 550 NS-EN 10034
IPE550 = ISection(0.55 m, 0.21 m, 0.0111 m, 0.0172 m);
IPE550.description = "NVS lib : IPE 550 NS-EN 10034";
// NVS lib : IPE 600 NS-EN 10034
IPE600 = ISection(0.6 m, 0.22 m, 0.012 m, 0.019 m);
IPE600.description = "NVS lib : IPE 600 NS-EN 10034";
OD101_6x5_2 = PipeSection(0.1016 m, 0.0052 m);
OD101_6x6_4 = PipeSection(0.1016 m, 0.0064 m);
OD114_3_2x7_9 = PipeSection(0.1143 m, 0.0079 m);
OD133x8 = PipeSection(0.133 m, 0.008 m);
OD1500x20 = PipeSection(1.5 m, 0.02 m);
OD1500x30 = PipeSection(1.5 m, 0.03 m);
OD1500x40 = PipeSection(1.5 m, 0.04 m);
OD1650x40 = PipeSection(1.65 m, 0.04 m);
OD1800x20 = PipeSection(1.8 m, 0.02 m);
OD1800x30 = PipeSection(1.8 m, 0.03 m);
OD1800x40 = PipeSection(1.8 m, 0.04 m);
OD193_7x8 = PipeSection(0.1937 m, 0.008 m);
OD2000x40 = PipeSection(2 m, 0.04 m);
OD2500x30 = PipeSection(2.5 m, 0.03 m);
OD762x25_4 = PipeSection(0.762 m, 0.0254 m);
OD76_2x5_5 = PipeSection(0.0762 m, 0.0055 m);
ODslings50 = PipeSection(0.05 m, 0.024 m);
// NVS lib : UNP 100 NS 1911
UNP100 = ChannelSection(0.1 m, 0.05 m, 0.006 m, 0.0085 m);
UNP100.description = "NVS lib : UNP 100 NS 1911";
// NVS lib : UNP 120 NS 1911
UNP120 = ChannelSection(0.12 m, 0.055 m, 0.007 m, 0.009 m);
UNP120.description = "NVS lib : UNP 120 NS 1911";
// NVS lib : UNP 140 NS 1911
UNP140 = ChannelSection(0.14 m, 0.06 m, 0.007 m, 0.01 m);
UNP140.description = "NVS lib : UNP 140 NS 1911";
// NVS lib : UNP 160 NS 1911
UNP160 = ChannelSection(0.16 m, 0.065 m, 0.0075 m, 0.0105 m);
```

```
UNP160.description = "NVS lib : UNP 160 NS 1911";
// NVS lib : UNP 180 NS 1911
UNP180 = ChannelSection(0.18 m, 0.07 m, 0.008 m, 0.011 m);
UNP180.description = "NVS lib : UNP 180 NS 1911";
// NVS lib : UNP 200 NS 1911
UNP200 = ChannelSection(0.2 m, 0.075 m, 0.0085 m, 0.0115 m);
UNP200.description = "NVS lib : UNP 200 NS 1911";
// NVS lib : UNP 220 NS 1911
UNP220 = ChannelSection(0.22 m, 0.08 m, 0.009 m, 0.0125 m);
UNP220.description = "NVS lib : UNP 220 NS 1911";
// NVS lib : UNP 240 NS 1911
UNP240 = ChannelSection(0.24 m, 0.085 m, 0.0095 m, 0.013 m);
UNP240.description = "NVS lib : UNP 240 NS 1911";
// NVS lib : UNP 260 NS 1911
UNP260 = ChannelSection(0.26 m, 0.09 m, 0.01 m, 0.014 m);
UNP260.description = "NVS lib : UNP 260 NS 1911";
// NVS lib : UNP 280 NS 1911
UNP280 = ChannelSection(0.28 m, 0.095 m, 0.01 m, 0.015 m);
UNP280.description = "NVS lib : UNP 280 NS 1911";
// NVS lib : UNP 300 NS 1911
UNP300 = ChannelSection(0.3 m, 0.1 m, 0.01 m, 0.016 m);
UNP300.description = "NVS lib : UNP 300 NS 1911";
// NVS lib : UNP 320 NS 1911
UNP320 = ChannelSection(0.32 m, 0.1 m, 0.014 m, 0.0175 m);
UNP320.description = "NVS lib : UNP 320 NS 1911";
// NVS lib : UNP 350 NS 1911
UNP350 = ChannelSection(0.35 m, 0.1 m, 0.014 m, 0.016 m);
UNP350.description = "NVS lib : UNP 350 NS 1911";
// NVS lib : UNP 380 NS 1911
UNP380 = ChannelSection(0.38 m, 0.102 m, 0.0135 m, 0.016 m);
UNP380.description = "NVS lib : UNP 380 NS 1911";
// NVS lib : UNP 400 NS 1911
UNP400 = ChannelSection(0.4 m, 0.11 m, 0.014 m, 0.018 m);
UNP400.description = "NVS lib : UNP 400 NS 1911";
// NVS lib : UNP 80 NS 1911
UNP80 = ChannelSection(0.08 m, 0.045 m, 0.006 m, 0.008 m);
UNP80.description = "NVS lib : UNP 80 NS 1911";

//Materials
steel_deck = MaterialLinear(275000 kPa, 16.192407 tonne/m^3, 210000000 kPa, 0.3, 1.2e-05 delC^-1, 3e-05 kN*s/m, 410000 kPa);
steel_Monopalo = MaterialLinear(275000 kPa, 1e-08 tonne/m^3, 210000000 kPa, 0.3, 1.2e-05 delC^-1, 3e-05 kN*s/m, 410000 kPa);
steel_no_density = MaterialLinear(275000 kPa, 1e-09 tonne/m^3, 210000000 kPa, 0.3, 1.2e-05 delC^-1, 3e-05 kN*s/m, 410000 kPa);
steel_Rinforzi = MaterialLinear(275000 kPa, 7.85 tonne/m^3, 210000000 kPa, 0.3, 1.2e-05 delC^-1, 3e-05 kN*s/m, 410000 kPa);
steel_slings = MaterialLinear(345000 kPa, 1e-08 tonne/m^3, 80000000 kPa, 0.3, 1.2e-05 delC^-1, 3e-05 kN*s/m, 470000 kPa);

//Reinforcements (can/stub - properties)
AutoCan = Reinforcement(0.25, 0.3 m, true);
AutoFixedLength = Reinforcement(0, 0 m, false);
AutoStub = Reinforcement(1, 0.6 m, true);
JointCan = Reinforcement(0.25, 0.3 m, false);

//Hinges
Hinge1 = Hinge(1, 1, 1, 1, 0, 0);

//Hydro Properties
BuoyancyArea1 = HydroBuoyancyArea(0.232792 m^2, 0.232792 m^2);
BuoyancyArea10 = HydroBuoyancyArea(1.6286 m^2, 1.23134 m^2);
BuoyancyArea11 = HydroBuoyancyArea(0.183469 m^2, 0.183469 m^2);
BuoyancyArea12 = HydroBuoyancyArea(1.58368 m^2, 1.18642 m^2);
BuoyancyArea13 = HydroBuoyancyArea(0.202319 m^2, 0.202319 m^2);
BuoyancyArea14 = HydroBuoyancyArea(1.93593 m^2, 1.53867 m^2);
BuoyancyArea15 = HydroBuoyancyArea(0.246301 m^2, 0.246301 m^2);
BuoyancyArea16 = HydroBuoyancyArea(2.89529 m^2, 2.49803 m^2);
BuoyancyArea2 = HydroBuoyancyArea(4.67595 m^2, 4.27869 m^2);
BuoyancyArea3 = HydroBuoyancyArea(0.111841 m^2, 0.111841 m^2);
BuoyancyArea4 = HydroBuoyancyArea(2.43285 m^2, 2.03559 m^2);
BuoyancyArea5 = HydroBuoyancyArea(0.166819 m^2, 0.166819 m^2);
BuoyancyArea6 = HydroBuoyancyArea(2.37787 m^2, 1.98061 m^2);
BuoyancyArea7 = HydroBuoyancyArea(0.221168 m^2, 0.221168 m^2);
BuoyancyArea8 = HydroBuoyancyArea(2.32352 m^2, 1.92626 m^2);
BuoyancyArea9 = HydroBuoyancyArea(0.138544 m^2, 0.138544 m^2);
FloodedGrouted = Flooding(1);
HydrodynamicDiameterGroutedInner = HydroDynamicDiameter(1e-05 m);
MarineGrowthGroutedInner = MarineGrowthConstant(0 m, 0 m, 1);
MarineGrowthGroutedInner.useInForceCalculations = false;
```

```
MorisonConstantGroutedInner = MorisonCoefficients(0, 0, 0, 0, 0, 0);
NonFloodedGrouted = Flooding(0);

//***** RULES *****//
//Compatibility Rules
GenieRules.Compatibility.version = "V7.9-4";
GenieRules.Compatibility.enable(SetDefaultNames, true);
GenieRules.Compatibility.enable(CaseInsensitiveFunctions, true);
GenieRules.Compatibility.enable(JournalledDefaultPrefix, true);
GenieRules.Compatibility.enable(SimplifyTopologyEnhancedVertexRemoval, true);
GenieRules.Compatibility.enable(PlateSnapping, true);
GenieRules.Compatibility.enable(PlateSortingCOGFirst, true);
GenieRules.Compatibility.enable(CurveSnapping, true);
GenieRules.Compatibility.enable(DefaultLongFemNames, true);
GenieRules.Compatibility.enable(DefaultEccentricHinghes, true);
GenieRules.Compatibility.enable(AutomaticallySaveModelAfterAnalysis, false);
GenieRules.Compatibility.enable(ValidateTransforms, true);
GenieRules.Compatibility.enable(CheckPlatesForErrorsDuringCreation, true);
GenieRules.Compatibility.enable(UseTopologySimplificationVersion7, true);
GenieRules.Compatibility.enable(UseSpliceVersionV, true);
GenieRules.Compatibility.enable(PreferLinearDependencies, true);
GenieRules.Compatibility.enable(PostponeFEMFileWrite, true);
GenieRules.Compatibility.enable(PostponeLoadApplication, true);
GenieRules.Compatibility.enable(UseSestra10, true);
GenieRules.Compatibility.enable(BucklingCapacityForSegmentedMembers, false);
GenieRules.Compatibility.enable(AlternativeJointBraceClassification, false);
GenieRules.Compatibility.enable(UseAutoSegmentation, false);

//Connected Move Rules
GenieRules.ConnectedMove.useStructuralPoints = false;
GenieRules.ConnectedMove.defaultConnected = false;
GenieRules.ConnectedMove.rearrangeXJoints = false;

//Geometry Rules
GenieRules.Geometry.beamTopologySnapping = true;
GenieRules.Geometry.guideCurveTopologySnapping = true;
GenieRules.Geometry.creationGrouping = cgGroupingOff;

//Joint Creation Rules
GenieRules.JointCreation.autoGenerate = false;
GenieRules.JointCreation.selectionAware = false;
GenieRules.JointCreation.exclude(geFreeThroughBeams, true);
GenieRules.JointCreation.exclude(geThroughBeamPure, true);
GenieRules.JointCreation.exclude(geThroughBeams, false);
GenieRules.JointCreation.exclude(geFreeBeamEnds, true);
GenieRules.JointCreation.exclude(ge2BeamAligned, true);
GenieRules.JointCreation.exclude(geBeamEnds, false);

//JointDesign Rules
GenieRules.JointDesign.setDefaultCanRule(0.25, 0.3 m);
GenieRules.JointDesign.setDefaultStubRule(1, 0.6 m);
GenieRules.JointDesign.canReinforcement = AutoCan;
GenieRules.JointDesign.stubReinforcement = AutoStub;
GenieRules.JointDesign.fixedLengthReinforcement = AutoFixedLength;
GenieRules.JointDesign.coneSection = AutoCone;
GenieRules.JointDesign.coneAngle = 9.462322207 deg;
GenieRules.JointDesign.minimumGap = 0.0508 m;
GenieRules.JointDesign.gapTolerance = 0.001 m;
GenieRules.JointDesign.planeTolerance = 1 deg;
GenieRules.JointDesign.braceAngleMoveLimit = 10 deg;
GenieRules.JointDesign.chordAlignmentTolerance = 5 deg;
GenieRules.JointDesign.flushBraces = false;
GenieRules.JointDesign.flushBraces = false;
GenieRules.JointDesign.iterations = 2;
GenieRules.JointDesign.AutoAdjustSegmentLength = true;

//Local Joint Flexibility (LJF) Rules
GenieRules.LJF.method = ljfBuitrago1993;
GenieRules.LJF.setLimit(ljfAxial, 0.1, 5);
GenieRules.LJF.setLimit(ljfIPB, 0.1, 5);
GenieRules.LJF.setLimit(ljfOPB, 0.1, 5);

//Meshing rules
GenieRules.Meshing.elementType = mp1stOrder;
```

```
GenieRules.Meshing.superElementType = 1;
GenieRules.Meshing.autoSimplifyTopology = true;
GenieRules.Meshing.autoSplitPeriodicGeometry = false;
GenieRules.Meshing.repairSplitTopology = false;
GenieRules.Meshing.preference(mpPreferRectangularMesh, false);
GenieRules.Meshing.preference(mpAllowTriangularElements, true);
GenieRules.Meshing.preference(mpPreferPointMassAsNodeMass, true);
GenieRules.Meshing.preference(mpUseDrillingElements, false);
GenieRules.Meshing.preference(mpUseEccentricHinges, true);
GenieRules.Meshing.eliminateInternalEdges = true;
GenieRules.Meshing.eliminateInternalVertices = true;
GenieRules.Meshing.preference(mpIncludeUnusedProperties, false);
GenieRules.Meshing.preference(mpEliminateInternalEccentricities, false);
GenieRules.Meshing.preference(mpIgnoreFilletRadius, false);
GenieRules.Meshing.preference(mpPreferLinearDependencies, true);
GenieRules.Meshing.preference(mpUseLongLoadcaseNames, true);
GenieRules.Meshing.preference(mpUseLongSetNames, true);
GenieRules.Meshing.preference(mpUseLongPropertyNames, true);
GenieRules.Meshing.preference(mpMeshDensityRounded, false);
GenieRules.Meshing.scantlings = msGross;
GenieRules.Meshing.ignoreEccentricities = false;
GenieRules.Meshing.useCocentricBeams = false;
GenieRules.Meshing.faceMeshStrategy = SesamQuadMesher;
GenieRules.Meshing.edgeMeshStrategy = UniformDistributionEdge;
GenieRules.Meshing.activate(mpMaxAngle, mpFail, true);
GenieRules.Meshing.setLimit(mpMaxAngle, mpFail, 179 deg);
GenieRules.Meshing.activate(mpMaxAngle, mpSplit, false);
GenieRules.Meshing.setLimit(mpMaxAngle, mpSplit, 165 deg);
GenieRules.Meshing.activate(mpMinAngle, mpFail, false);
GenieRules.Meshing.setLimit(mpMinAngle, mpFail, 1 deg);
GenieRules.Meshing.activate(mpMinAngle, mpSplit, false);
GenieRules.Meshing.setLimit(mpMinAngle, mpSplit, 15 deg);
GenieRules.Meshing.activate(mpMaxRelativeJacobi, mpFail, false);
GenieRules.Meshing.setLimit(mpMaxRelativeJacobi, mpFail, 10);
GenieRules.Meshing.activate(mpMaxRelativeJacobi, mpSplit, false);
GenieRules.Meshing.setLimit(mpMaxRelativeJacobi, mpSplit, 5);
GenieRules.Meshing.activate(mpMinNormalizedJacobi, mpFail, false);
GenieRules.Meshing.setLimit(mpMinNormalizedJacobi, mpFail, 0);
GenieRules.Meshing.activate(mpMinNormalizedJacobi, mpSplit, false);
GenieRules.Meshing.setLimit(mpMinNormalizedJacobi, mpSplit, 0.2);
GenieRules.Meshing.activate(mpMinEdge, false);
GenieRules.Meshing.setLimit(mpMinEdge, 0.1);
GenieRules.Meshing.activate(mpMinEdgeByLength, false);
GenieRules.Meshing.setLimit(mpMinEdgeByLength, 0 m);
GenieRules.Meshing.activate(mpMinNonConceptualEdge, false);
GenieRules.Meshing.setLimit(mpMinNonConceptualEdge, 1);
GenieRules.Meshing.activate(mpMaxChord, false);
GenieRules.Meshing.setLimit(mpMaxChord, 0.2);
GenieRules.Meshing.activate(mpMaxTwistAngle, mpFail, false);
GenieRules.Meshing.setLimit(mpMaxTwistAngle, mpFail, 30 deg);
GenieRules.Meshing.activate(mpMaxTwistAngle, mpSplit, false);
GenieRules.Meshing.setLimit(mpMaxTwistAngle, mpSplit, 10 deg);
GenieRules.Meshing.activate(mpMinMaxDensityRatio, false);
GenieRules.Meshing.setLimit(mpMinMaxDensityRatio, 0.1);
GenieRules.Meshing.basicLCfactor = 1;
GenieRules.Meshing.analysisFolders = true;
GenieRules.Meshing.preference(mpAdjustNumberOfElements, true);
GenieRules.Meshing.useUniformizedFaceParameterization = false;
GenieRules.Meshing.longitudinalMassOnNonStructuralElements = true;

//Tolerances Rules
GenieRules.Tolerances.angleTolerance = 2 deg;
GenieRules.Tolerances.pointTolerance = 0.01 m;
GenieRules.Tolerances.useTolerantModelling = true;

//Set Rules
GenieRules.Sets.scriptCompact = true;

//Beam Creation Rules

//Beam Creation Rules
GenieRules.Transformation.CopyTransformerMethod = tmUseModelTransformer;

//***** STRUCTURE *****//
GenieRules.JointDesign.AutoAdjustSegmentLength = false;
```

```
//Beams
steel_deck.setDefault();
HE140B.setDefault();
Bm51 = Beam(Point(2 m,6 m,8.15 m), Point(2 m,2 m,8.15 m));
Bm52 = Beam(Point(2 m,2 m,8.15 m), Point(6 m,2 m,8.15 m));
Bm57 = Beam(Point(6 m,2 m,8.15 m), Point(6 m,6 m,8.15 m));
Bm58 = Beam(Point(6 m,6 m,8.15 m), Point(2 m,6 m,8.15 m));
Bm59 = Beam(Point(2 m,2 m,12.1 m), Point(2 m,2 m,8.025 m));
Bm59.localSystem = LocalSystem(Vector3d(0 m,0 m,-1 m), Vector3d(1 m,0 m,0 m));
Bm59.buckling = BucklingFactor(2 m, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm60 = Beam(Point(2 m,6 m,12.1 m), Point(2 m,6 m,8.025 m));
Bm60.localSystem = LocalSystem(Vector3d(0 m,0 m,-1 m), Vector3d(1 m,0 m,0 m));
Bm60.buckling = BucklingFactor(2 m, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm61 = Beam(Point(6 m,6 m,12.1 m), Point(6 m,6 m,8.025 m));
Bm61.localSystem = LocalSystem(Vector3d(0 m,0 m,-1 m), Vector3d(1 m,0 m,0 m));
Bm61.buckling = BucklingFactor(2 m, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm62 = Beam(Point(6 m,2 m,12.1 m), Point(6 m,2 m,8.025 m));
Bm62.localSystem = LocalSystem(Vector3d(0 m,0 m,-1 m), Vector3d(1 m,0 m,0 m));
Bm62.buckling = BucklingFactor(2 m, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm79 = Beam(Point(2 m,6 m,8.15 m), Point(2 m,4.1 m,12.1 m));
Bm80 = Beam(Point(2 m,2 m,8.15 m), Point(2 m,3.9 m,12.1 m));
Bm81 = Beam(Point(2 m,2 m,8.15 m), Point(3.9 m,2 m,12.1 m));
Bm82 = Beam(Point(6 m,2 m,8.15 m), Point(4.1 m,2 m,12.1 m));
Bm83 = Beam(Point(6 m,2 m,8.15 m), Point(6 m,3.9 m,12.1 m));
Bm84 = Beam(Point(6 m,6 m,8.15 m), Point(6 m,4.1 m,12.1 m));
Bm85 = Beam(Point(6 m,6 m,8.15 m), Point(4.1 m,6 m,12.1 m));
Bm86 = Beam(Point(2 m,6 m,8.15 m), Point(3.9 m,6 m,12.1 m));

HE200B.setDefault();
Bm147 = Beam(Point(6 m,2 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm147.divideSegmentAt(1, 0.2357022604);
Bm147.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.1 m)), ConstantCurveOffsetAtPoint(Vector3d(0.5 m, -0.5 m, -0.1 m)), false);
Bm147.buckling = BucklingFactor(bucklingLengthOptionBeamLength, bucklingLengthOptionBeamLength, 2.1, 2.1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1,
unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm148 = Beam(Point(2 m,2 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm148.divideSegmentAt(1, 0.2357022604);
Bm148.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.1 m)), ConstantCurveOffsetAtPoint(Vector3d(-0.5 m, -0.5 m, -0.1 m)), false);
Bm148.buckling = BucklingFactor(bucklingLengthOptionBeamLength, bucklingLengthOptionBeamLength, 2.1, 2.1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1,
unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm149 = Beam(Point(2 m,6 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm149.divideSegmentAt(1, 0.2357022604);
Bm149.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.1 m)), ConstantCurveOffsetAtPoint(Vector3d(-0.5 m, 0.5 m, -0.1 m)), false);
Bm149.buckling = BucklingFactor(bucklingLengthOptionBeamLength, bucklingLengthOptionBeamLength, 2.1, 2.1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1,
unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm150 = Beam(Point(6 m,6 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm150.divideSegmentAt(1, 0.2357022604);
Bm150.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.1 m)), ConstantCurveOffsetAtPoint(Vector3d(0.5 m, 0.5 m, -0.1 m)), false);
Bm150.buckling = BucklingFactor(bucklingLengthOptionBeamLength, bucklingLengthOptionBeamLength, 2.1, 2.1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1,
unbracedLengthOptionNone, unbracedLengthOptionNone);


IPE120.setDefault();
Bm139 = Beam(Point(2 m,4.5 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm139.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.09 m)), ConstantCurveOffsetAtPoint(Vector3d(-0.5 m, 0.5 m, -0.09 m)), false);
Bm140 = Beam(Point(2 m,3.5 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm140.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.09 m)), ConstantCurveOffsetAtPoint(Vector3d(-0.5 m, -0.5 m, -0.09 m)), false);
Bm141 = Beam(Point(3.5 m,2 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm141.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.09 m)), ConstantCurveOffsetAtPoint(Vector3d(-0.5 m, -0.5 m, -0.09 m)), false);
Bm142 = Beam(Point(4.5 m,2 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm142.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.09 m)), ConstantCurveOffsetAtPoint(Vector3d(0.5 m, -0.5 m, -0.09 m)), false);
Bm143 = Beam(Point(6 m,3.5 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm143.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.09 m)), ConstantCurveOffsetAtPoint(Vector3d(0.5 m, -0.5 m, -0.09 m)), false);
Bm144 = Beam(Point(6 m,4.5 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm144.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.09 m)), ConstantCurveOffsetAtPoint(Vector3d(0.5 m, 0.5 m, -0.09 m)), false);
Bm145 = Beam(Point(4.5 m,6 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm145.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.09 m)), ConstantCurveOffsetAtPoint(Vector3d(0.5 m, 0.5 m, -0.09 m)), false);
Bm146 = Beam(Point(3.5 m,6 m,8.025 m), Point(4 m,4 m,8.025 m));
Bm146.CurveOffset = LinearVaryingCurveOffset(ConstantCurveOffsetAtPoint(Vector3d(0 m, 0 m, -0.09 m)), ConstantCurveOffsetAtPoint(Vector3d(-0.5 m, 0.5 m, -0.09 m)), false);
```

```
IPE140.setDefault();
Bm100 = Beam(Point(6 m,2 m,10 m), Point(6 m,6 m,10 m));
Bm100.divideSegmentAt(1, 0.3);
Bm100.divideSegmentAt(2, 0.5714285714);
Bm100.buckling = BucklingFactor(2 m, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm101 = Beam(Point(6 m,6 m,10 m), Point(2 m,6 m,10 m));
Bm101.divideSegmentAt(1, 0.3);
Bm101.divideSegmentAt(2, 0.5714285714);
Bm101.buckling = BucklingFactor(2 m, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm102 = Beam(Point(2 m,6 m,10 m), Point(2 m,2 m,10 m));
Bm102.divideSegmentAt(1, 0.3);
Bm102.divideSegmentAt(2, 0.5714285714);
Bm102.buckling = BucklingFactor(2 m, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone, unbracedLengthOptionNone);

Bm103 = Beam(Point(3.2 m,6 m,10 m), Point(3.2 m,2 m,10 m));
Bm103.buckling = BucklingFactor(bucklingLengthOptionBeamLength, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone,
unbracedLengthOptionNone);

Bm104 = Beam(Point(4.8 m,6 m,10 m), Point(4.8 m,2 m,10 m));
Bm104.buckling = BucklingFactor(bucklingLengthOptionBeamLength, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone,
unbracedLengthOptionNone);

Bm105 = Beam(Point(2 m,4.8 m,10 m), Point(6 m,4.8 m,10 m));
Bm105.buckling = BucklingFactor(bucklingLengthOptionBeamLength, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone,
unbracedLengthOptionNone);

Bm106 = Beam(Point(2 m,3.2 m,10 m), Point(6 m,3.2 m,10 m));
Bm106.buckling = BucklingFactor(bucklingLengthOptionBeamLength, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone,
unbracedLengthOptionNone);

Bm99 = Beam(Point(2 m,2 m,10 m), Point(6 m,2 m,10 m));
Bm99.divideSegmentAt(1, 0.3);
Bm99.divideSegmentAt(2, 0.5714285714);
Bm99.buckling = BucklingFactor(2 m, 2 m, 1, 1, 1, 1, stiffenerSpacingOptionNone, stiffenerSpacingOptionNone, 1, unbracedLengthOptionNone, unbracedLengthOptionNone);


UNP200.setDefault();
Bm135 = Beam(Point(6 m,6 m,8.025 m), Point(6 m,2 m,8.025 m));
Bm135.divideSegmentAt(1, 0.375);
Bm135.divideSegmentAt(2, 0.4);
Bm135.CurveOffset = AlignedCurveOffset(frFlushTop, 0 m);

Bm136 = Beam(Point(6 m,2 m,8.025 m), Point(2 m,2 m,8.025 m));
Bm136.divideSegmentAt(1, 0.375);
Bm136.divideSegmentAt(2, 0.4);
Bm136.CurveOffset = AlignedCurveOffset(frFlushTop, 0 m);

Bm137 = Beam(Point(2 m,2 m,8.025 m), Point(2 m,6 m,8.025 m));
Bm137.divideSegmentAt(1, 0.375);
Bm137.divideSegmentAt(2, 0.4);
Bm137.CurveOffset = AlignedCurveOffset(frFlushTop, 0 m);

Bm138 = Beam(Point(2 m,6 m,8.025 m), Point(6 m,6 m,8.025 m));
Bm138.divideSegmentAt(1, 0.375);
Bm138.divideSegmentAt(2, 0.4);
Bm138.CurveOffset = AlignedCurveOffset(frFlushTop, 0 m);


steel_Monopalo.setDefault();
OD1500x20.setDefault();
Bm227 = Beam(Point(4 m,4 m,8.025 m), Point(4 m,4 m,6.525 m));

steel_slings.setDefault();
ODslings50.setDefault();
Bm65 = Beam(Point(2.471404521 m,2.471404521 m,8.025 m), Point(4 m,4 m,15.025 m));
Bm65.localSystem = LocalSystem(Vector3d(0.2086477919 m,0.2086477918 m,0.9554748547 m), Vector3d(-0.7143391246 m,-0.6347656786 m,0.2946050718 m));
Bm65.setEndHinge(1, Hinge1);

Bm66 = Beam(Point(5.528595479 m,2.471404521 m,8.025 m), Point(4 m,4 m,14.925 m));
Bm66.localSystem = LocalSystem(Vector3d(-0.2114031509 m,0.2114031509 m,0.9542627602 m), Vector3d(0.7160285775 m,-0.6310650595 m,0.2984291657 m));
Bm66.setEndHinge(1, Hinge1);
```

```
Bm75 = Beam(Point(4 m,4 m,14.925 m), Point(2.471404521 m,5.528595479 m,8.025 m));
Bm75.localSystem = LocalSystem(Vector3d(-0.2114031509 m,0.2114031509 m,-0.9542627602 m), Vector3d(-0.7188336544 m,0.6279053263 m,0.2983505967 m));
Bm75.setEndHinge(2, Hinge1);

Bm77 = Beam(Point(4 m,4 m,15.025 m), Point(5.528595479 m,5.528595479 m,8.025 m));
Bm77.localSystem = LocalSystem(Vector3d(0.2086477919 m,0.2086477919 m,-0.9554748547 m), Vector3d(0.7157474086 m,0.6331939134 m,0.2945693723 m));
Bm77.setEndHinge(2, Hinge1);


//Supports
Sp1 = SupportPoint(Point(4 m,4 m,15.025 m));
Sp1.boundary = BoundaryCondition(Fixed, Fixed, Fixed, Free, Free, Fixed);


Sp2 = SupportPoint(Point(2 m,2 m,8.025 m));
Sp2.boundary = BoundaryCondition(Fixed, Free, Free, Free, Free, Fixed);


Sp3 = SupportPoint(Point(4 m,4 m,14.925 m));
Sp3.boundary = BoundaryCondition(Fixed, Fixed, Free, Free, Free, Fixed);


Sp4 = SupportPoint(Point(6 m,2 m,8.025 m));
Sp4.boundary = BoundaryCondition(Free, Fixed, Free, Free, Free, Fixed);



//MassPoints
Mass1 = PointMass(Point(4 m,4 m,6.525 m), 7.5 tonne);

GenieRules.JointDesign.AutoAdjustSegmentLength = true;
//***** GUIDING GEOMETRY *****//
//Guiding Geometry
Point1 = Point(4 m,4 m,8.025 m);

//***** ENVIRONMENT *****//
//***** EQUIPMENTS *****//
//***** SETS ( Create ) *****//
//Sets
Azalea2 = Set();
deck = Set();
livello_inf = Set();
moncherini = Set();

//***** LOAD MODELLING AND ANALYSIS *****//
gravity = LoadCase();
gravity.setFemLoadcase(1);
gravity.designCondition(lcOperating);
Forza_skew = LoadCase();
Forza_skew.setFemLoadcase(2);
Forza_skew.designCondition(lcOperating);
gravity.includeSelfWeight();
gravity.excludeStructureMassWithRotationField();
gravity.meshLoadsAsMass(false);

Forza_skew.excludeSelfWeight();
Forza_skew.includeStructureMassWithRotationField();
Forza_skew.meshLoadsAsMass(false);
//  Loads
PLoad1 = PointLoad(Forza_skew, Point(4 m,4 m,14.925 m), 0 kN, 0 kN, 73.575 kN, 0 kN*m, 0 kN*m, 0 kN*m);


//Analyses
Analysis1 = Analysis(true);
Analysis1.add(MeshActivity());
Analysis1.step(1).beamsAsMembers = true;
Analysis1.step(1).smartLoadCombinations = true;
Analysis1.step(1).writeLoadCombinationsOnFirstLevelAsBSELL = false;
Analysis1.step(1).includeLoadsOnMesh = false;
Analysis1.step(1).needsRemeshLoads = false;
Analysis1.step(1).multithreadedLoadApplier = true;
Analysis1.step(1).multithreadedMesher = false;
Analysis1.step(1).writeFEMFile = false;
Analysis1.step(1).usePartialMesher = true;
Analysis1.step(1).lockMeshedConcepts = true;
```

```
Analysis1.step(1).pileBoundaryCondition = pmFixed;
Analysis1.step(1).nodeNumberFromJointName = false;
Analysis1.step(1).elementNumberFromBeamName = false;
Analysis1.step(1).regenerateMeshOption = anAlwaysRegenerateMesh;
Analysis1.add(LinearAnalysis());
Analysis1.step(2).warpCorrection = true;
Analysis1.step(2).continueOnError = false;
Analysis1.step(2).resultFileFormat = SIN_Norsam;
Analysis1.step(2).setStaticAnalysis();
Analysis1.step(2).useSestra10 = false;
Analysis1.step(2).stressStiffening = false;
Analysis1.add(LoadResultsActivity());
LC1_HC_125 = LoadCombination(Analysis1);
LC1_HC_125.designCondition(lcOperating);
LC1_HC_125.convertLoadToMass = false;
LC1_HC_125.globalScaleFactor = 1;
LC2_MC_125 = LoadCombination(Analysis1);
LC2_MC_125.designCondition(lcOperating);
LC2_MC_125.convertLoadToMass = false;
LC2_MC_125.globalScaleFactor = 1;
LC3_LC_125 = LoadCombination(Analysis1);
LC3_LC_125.designCondition(lcOperating);
LC3_LC_125.convertLoadToMass = false;
LC3_LC_125.globalScaleFactor = 1;
LC4_HC_075 = LoadCombination(Analysis1);
LC4_HC_075.designCondition(lcOperating);
LC4_HC_075.convertLoadToMass = false;
LC4_HC_075.globalScaleFactor = 1;
LC5_MC_075 = LoadCombination(Analysis1);
LC5_MC_075.designCondition(lcOperating);
LC5_MC_075.convertLoadToMass = false;
LC5_MC_075.globalScaleFactor = 1;
LC6_LC_075 = LoadCombination(Analysis1);
LC6_LC_075.designCondition(lcOperating);
LC6_LC_075.convertLoadToMass = false;
LC6_LC_075.globalScaleFactor = 1;
LC1_HC_125.addCase(gravity, 3.42);
LC1_HC_125.addCase(Forza_skew, 4.276);
LC1_HC_125.EquipmentRep = EquipmentAsLineLoads;


LC2_MC_125.addCase(gravity, 3.03);
LC2_MC_125.addCase(Forza_skew, 3.782);
LC2_MC_125.EquipmentRep = EquipmentAsLineLoads;


LC3_LC_125.addCase(gravity, 2.63);
LC3_LC_125.addCase(Forza_skew, 3.289);
LC3_LC_125.EquipmentRep = EquipmentAsLineLoads;


LC4_HC_075.addCase(gravity, 3.42);
LC4_HC_075.addCase(Forza_skew, 2.565);
LC4_HC_075.EquipmentRep = EquipmentAsLineLoads;


LC5_MC_075.addCase(gravity, 3.03);
LC5_MC_075.addCase(Forza_skew, 2.269);
LC5_MC_075.EquipmentRep = EquipmentAsLineLoads;


LC6_LC_075.addCase(gravity, 2.63);
LC6_LC_075.addCase(Forza_skew, 1.973);
LC6_LC_075.EquipmentRep = EquipmentAsEccentricMass;




//***** LOAD INTERFACES *****//
//***** MODEL VIEWS *****//
//***** SETS ( Fill ) *****//
//Sets
Azalea2.add(Bm100);
Azalea2.add(Bm101);
Azalea2.add(Bm102);
```

```
Azalea2.add(Bm103);
Azalea2.add(Bm104);
Azalea2.add(Bm105);
Azalea2.add(Bm106);
Azalea2.add(Bm135);
Azalea2.add(Bm136);
Azalea2.add(Bm137);
Azalea2.add(Bm138);
Azalea2.add(Bm139);
Azalea2.add(Bm140);
Azalea2.add(Bm141);
Azalea2.add(Bm142);
Azalea2.add(Bm143);
Azalea2.add(Bm144);
Azalea2.add(Bm145);
Azalea2.add(Bm146);
Azalea2.add(Bm147);
Azalea2.add(Bm148);
Azalea2.add(Bm149);
Azalea2.add(Bm150);
Azalea2.add(Bm51);
Azalea2.add(Bm52);
Azalea2.add(Bm57);
Azalea2.add(Bm58);
Azalea2.add(Bm59);
Azalea2.add(Bm60);
Azalea2.add(Bm61);
Azalea2.add(Bm62);
Azalea2.add(Bm79);
Azalea2.add(Bm80);
Azalea2.add(Bm81);
Azalea2.add(Bm82);
Azalea2.add(Bm83);
Azalea2.add(Bm84);
Azalea2.add(Bm85);
Azalea2.add(Bm86);
Azalea2.add(Bm99);
Azalea2.add(Point1);

deck.add(Bm100);
deck.add(Bm101);
deck.add(Bm102);
deck.add(Bm103);
deck.add(Bm104);
deck.add(Bm105);
deck.add(Bm106);
deck.add(Bm135);
deck.add(Bm136);
deck.add(Bm137);
deck.add(Bm138);
deck.add(Bm139);
deck.add(Bm140);
deck.add(Bm141);
deck.add(Bm142);
deck.add(Bm143);
deck.add(Bm144);
deck.add(Bm145);
deck.add(Bm146);
deck.add(Bm147);
deck.add(Bm148);
deck.add(Bm149);
deck.add(Bm150);
deck.add(Bm51);
deck.add(Bm52);
deck.add(Bm57);
deck.add(Bm58);
deck.add(Bm59);
deck.add(Bm60);
deck.add(Bm61);
deck.add(Bm62);
deck.add(Bm79);
deck.add(Bm80);
deck.add(Bm81);
deck.add(Bm82);
deck.add(Bm83);
```

```
deck.add(Bm84);
deck.add(Bm85);
deck.add(Bm86);
deck.add(Bm99);
deck.add(Point1);

livello_inf.add(Bm135);
livello_inf.add(Bm136);
livello_inf.add(Bm137);
livello_inf.add(Bm138);
livello_inf.add(Bm139);
livello_inf.add(Bm140);
livello_inf.add(Bm141);
livello_inf.add(Bm142);
livello_inf.add(Bm143);
livello_inf.add(Bm144);
livello_inf.add(Bm145);
livello_inf.add(Bm146);
livello_inf.add(Bm147);
livello_inf.add(Bm148);
livello_inf.add(Bm149);
livello_inf.add(Bm150);
livello_inf.add(Point1);

moncherini.add(Bm227);
moncherini.add(Mass1);
```