NTNU

April 26, 2023

Results from Element Matching

Project name: Bod nidarosdomen

Construction site located at: 63.4269, 10.3969

Summary of results

Total score	Substitutions	Savings
1088.76 kr	81.58%	57.96%

The 'Greedy Algorithm Plural' algorithm yields the best results, substituting 31/38 demand elements (81.58%). Using 'Combined' as the optimization metric, a total score of 1088.76 kr is achieved. For comparison, a score of 2589.85 kr would have been obtained by employing exclusively new materials. This results in a total saving of 57.96%. Note that transportation is not accounted for. Open the CSV file with the file path './Results/substitutions.csv' to examine the substitutions.

Constants used in calculations

Constant	Value	Unit
Density timber	491.0	kg/m^3
Density steel	7850	kg/m^3
GWP new timber	28.9	kg C02 equivalents
GWP reused timber	2.25	kg C02 equivalents
GWP new steel	800.0	kg C02 equivalents
GWP reused steel	4.0	kg C02 equivalents
Valuation of GWP	0.6	kr/kg C02 equivalents
Price new timber	435.0	kr/m^3
Price reused timber	100.0	kr/m^3

Price new steel	200.0	kr/m^3
Price reused steel	200.0	kr/m^3

Information about datasets

Elements	Filename	Number of elements
Reused	SUPPLY_DATAFRAME_SVERRE.xlsx	109
Demand	DEMAND_DATAFRAME_SVERRE.xlsx	38

Performance of algorithms

Name	Score	Substitutions	Time
Greedy Algorithm Plural	1088.76	81.58%	0.059

The design tool is runned with 1 algorithms, namely: Greedy Algorithm Plural. The Greedy Algorithm Plural yields the lowest score, as shown in the table. The substitutions by this algorithm are completed in 0.059 seconds.