Appendix A. Calibration tests

In order to better exploit the efficiency of the algorithm, we have performed two required parameter calibrations for the IGPSB: the percentage of elements to be *destroyed* (`%Dest`) from the solution and the value of the parameter β, which is used to compute the threshold of acceptance of poorer quality solutions. For these experiments, we use the corresponding set of calibration instances and fix the affinity value to $\gamma = 0.20$ (as it obtained better results in the preliminary tests), the time limit to solve the MILP used to construct an initial feasible SLA is set to 600 s, and the stopping criteria for the IGPSB are fix to $\texttt{iterIG}_{\text{max}} = 100$ iterations and `MaxOptTime` = 3600 s.

A.1. *Calibration of percentage of solution destruction parameter*

The first parameter to calibrate is `%Dest`, the number of elements to remove from a solution during the `Destruction` step (line 5, Algorithm 1). We consider three factor levels, `%Dest` = 30, 50, and 70, which mean that, for a given solution s, it is required to remove (randomly) 30/50/70% of the total number of selected racks, which later will be reassigned (greedily) in the same proportion during the `reConstruction` procedure. For these specific experiments, we also fix the parameter $\beta = 0$, which corresponds to the option of not accepting poor-quality solutions during the IGPSB. Since the `Destruction` procedure applies a random selection of solution elements to remove, we consider 4 repetitions of the IGPSB for each tested instance.

Table A1 shows the results obtained per each `%Dest` and instance size. The first column is assigned to the instance size; in the second one, the `%Dest` values to be evaluated are shown; and, in column blocks RPD and Time(s), we provide the minimum (Min), the average (Avg), and the maximum (Max) ARP/Time obtained per each group size of the calibration set. It is observed for small instances ($r = 30, 60$) that a local optimum was found, and the perturbations applied to the solutions were enough to find a good result in few seconds providing no difference among the `%Dest` options in terms of solution quality; however, in terms of computing times, removing a 30% of the solution requires less time than removing 50 or 70%. On the other hand, for large instances ($r = 100, 500$), it is easier to identify the options that obtain the best results providing more information about the algorithm performance when the value of `%Dest` varies. We can observe that the best RPD values and computing times are obtained when the percentage of the elements to remove is 30%, obtaining 1.30% of ARPD in 843.7s on average (the maximum RPD is also small for this case). Therefore, the value of `%Dest` = 30 is definitely the percentage to be destroyed of a given solution s in the IGPSB as it outperforms the other options.

A.1.1. Calibration of β

The second parameter to calibrate corresponds to β, which is a value in the [0,1] range used to calculate the threshold of acceptance of poor-quality solutions during the IGPSB (see Algorithm 2). The smaller the β value, the tighter the acceptance threshold and fewer solutions with worse objective value will be accepted. A value near 1 allows to accept any solution that falls within the current gap computed between the best solution found so far and the last (average) solution obtained in the current iteration. For these tests, we set this parameter to $\beta = 0.0, 0.1, 0.2$ and 0.3. Since it is important that the algorithm has a mechanism for escaping from local optima, the

Table A1.: Average RPD and computing times by removing a % of the solution in the IGPSB

Instance	%Dest	RPD			Time(s)		
		Min	Avg	Max	Min	Avg	Max
r30	**30**	0.00%	0.00%	0.00%	200.5	272.1	363.6
r60		0.00%	0.00%	0.00%	205.0	276.9	369.9
r100		0.00%	0.02%	0.08%	339.7	441.0	533.4
r500		0.00%	5.18%	16.60%	1855.4	2384.6	2940.7
Avg		**0.00%**	**1.30%**	**4.17%**	**650.1**	**843.7**	**1051.9**
r30	**50**	0.00%	0.00%	0.00%	323.9	444.5	646.1
r60		0.00%	0.00%	0.00%	341.0	428.3	554.2
r100		0.00%	1.11%	4.35%	419.5	551.4	676.5
r500		4.65%	16.42%	35.24%	2364.5	2977.8	3399.2
Avg		1.16%	4.38%	9.90%	862.2	1100.5	1319.0
r30	**70**	0.00%	0.00%	0.00%	363.6	646.1	511.9
r60		0.00%	0.00%	0.00%	369.9	554.2	610.7
r100		0.08%	4.35%	0.08%	533.4	676.5	533.4
r500		16.6%	35.24%	23.63%	2940.7	3399.2	3432.7
Avg		4.17%	9.90%	5.93%	1051.9	1319.0	1272.2

parameter $\beta = 0.0$ will be used only for comparative terms on the degradation of the quality of the solution when considering greater values of this parameter. The aim is to determine the $\beta > 0.0$ that obtains the best trade-off between the average RPD and the average computing times. We consider all the parameters mentioned in the previous tests including `%Dest` = 30. Four repetitions of the IGPSB are carried out for each tested instance.

The description of Table A2 is similar to that of Table A1, but now the comparison is with respect to β. According to the results shown in Table A2, there is a clear option that provides better results on average, which corresponds to $\beta = 0.3$. We can observe that, although the average RPD has been slightly better when $\beta = 0.0$, this option does not allow to escape from local optimal eliminating any possibility of improving the solution. Furthermore, the number of best solutions found, and the average computing times are better when $\beta = 0.3$, the latter giving the opportunity to further explore the solution space (if the stopping criteria allow it) in order to find better solutions at the end of the optimization. Therefore, $\beta = 0.3$ is the value that provides the best trade-off among the evaluated options.

Table A2.: RPD and computing times considering different β values in the IGPSB

Instance	β	#Best	RPD			Time(s)		
			Min	Avg	Max	Min	Avg	Max
r30	**0.0**	10/10	0.00%	0.00%	0.00%	200.50	272.09	363.64
r60		10/10	0.00%	0.00%	0.00%	204.96	276.92	369.85
r100		10/10	0.00%	0.00%	0.00%	339.67	440.97	533.36
r500		10/10	0.00%	4.32%	10.49%	1855.42	2384.62	2940.68
Avg			**0.0%**	**1.1%**	**2.6%**	**650.14**	**843.65**	**1051.88**
r30	**0.1**	10/10	0.00%	0.00%	0.00%	76.80	81.15	85.98
r60		10/10	0.00%	0.00%	0.00%	82.07	87.28	92.72
r100		10/10	0.00%	1.11%	4.35%	271.52	310.00	385.08
r500		8/10	4.35%	11.54%	24.30%	1564.97	1659.98	1764.41
Avg			1.1%	3.2%	7.2%	498.84	534.60	582.05
r30	**0.2**	10/10	0.00%	0.00%	0.00%	78.92	83.86	88.82
r60		10/10	0.00%	0.00%	0.00%	81.23	88.47	96.56
r100		10/10	0.00%	1.11%	4.35%	265.02	309.73	376.41
r500		8/10	4.35%	12.95%	27.60%	1594.46	1724.32	1910.12
Avg			1.1%	3.5%	8.0%	504.91	551.59	617.98
r30	**0.3**	10/10	0.00%	0.00%	0.00%	78.72	83.21	88.69
r60		10/10	0.00%	0.00%	0.00%	81.08	88.59	97.04
r100		10/10	0.00%	1.11%	4.35%	269.22	309.13	371.56
r500		9/10	1.20%	9.66%	23.04%	1575.94	1668.64	1761.99
Avg			**0.3%**	**2.7%**	**6.8%**	**501.24**	**537.39**	**579.82**