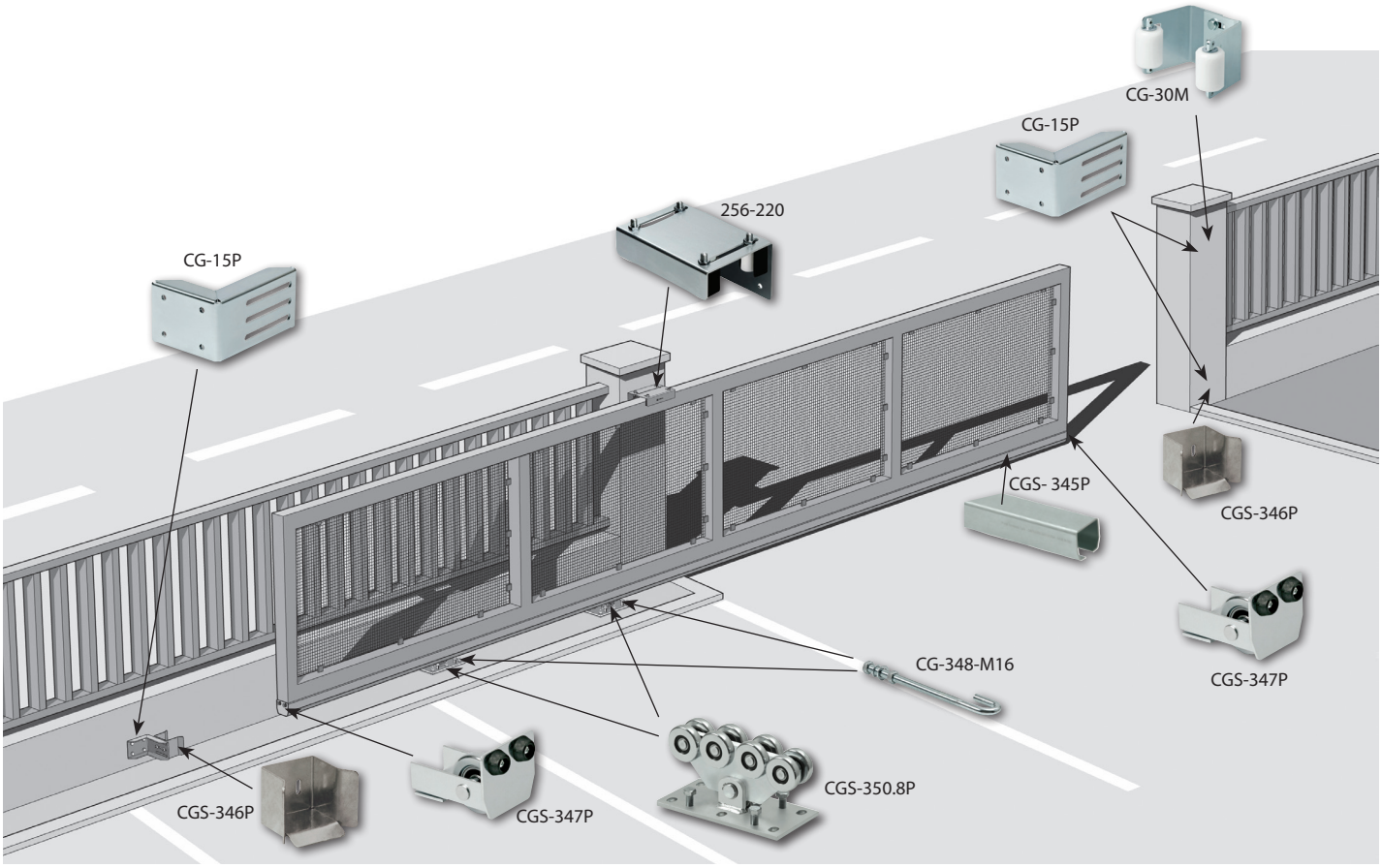
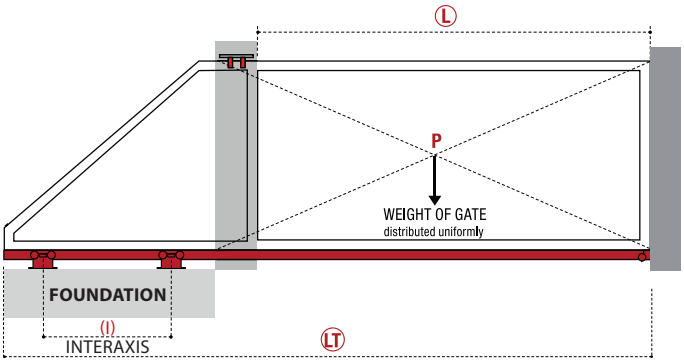
DURAGATES®
CANTILEVER GATES, EVOLVED

Optimizing Cantilever Configurations



It is important to understand what the configurator does when you run a configuration, so you can understand how to "manipulate" it to get the results you want. The Comunello configurator returns a minimum length configuration for the carriage selected based on your gate specs opening length and weight. But what do you do when you aren't looking for the shortest gate possible? The answer is simple, but not intuitive. You pad the weight to get either the total gate length or carriage spacing you want.



ARCHITECTURAL IRON DESIGNS, INC.
2E Chimney Rock Rd., Bound Brook, NJ 08805
Ph: (908) 757-2323 | Fax: (908) 757-3439 | aisales@archirondesign.com
www.archirondesign.com/comunello | duragates.com

Why would you want or need to Optimize a configuration?

- Backside space considerations.
    - You need enough space behind the gate for the gate to open into. For typical cantilever gates, you need about one and a half times the opening length. But you can select heavier capacity hardware and get a shorter gate to fit less space.
- Minimize the hardware cost
    - Often two or more options will work for the application, and choosing a lower capacity carriage with a wider spacing will lower the hardware cost while increasing the gate length.
- The gate design has a specified fixed length, or you want the length to match available track lengths
    - If the gate length is defined for aesthetic reasons rather than physical constraints, you need to adjust the configuration to match the design where possible.
- Very high cycle applications
    - We recommend choosing a carriage one step larger than needed for these gates. This allows you to pad the weight input, so the final configuration is for a carriage with significantly more capacity than the gate actually weighs. This extends the life of the gate.
- To use a specific hardware model
    - Not all products are in stock from your distribution source and knowing what is available saves time is and reduces having to do it over
- To use Integrator hardware that requires longer carriage spacing
    - For Integrator hardware, the minimum carriage spacing supported by warranty is a 30% carriage spacing. There is no adjustment built into the drive system, so gate deflection must be minimized, and a wider carriage spacing helps to reduce binding between the rack rail and pinion gear driving the gate.
- To minimize the visible "teeter-totter" effect as the gate cycles
    - All cantilever gates have a "rise and fall" effect as the gate moves over the center of the carriages because there must be enough space between the wheels and track to keep them from binding. When the carriages spacing is less than 20% of the opening length the rise and fall, often called teeter-totter, becomes noticeable. She shorter the spacing, the more obvious it becomes. This does not affect the performance of the gate, but it is usually considered an undesirable characteristic, so we want to minimize it as much as possible.

Or simply, to get what you consider the best gate configuration for your project.

To configure a gate, you have three inputs:

- Gate frame or hardware material: Steel, Aluminum, or Stainless Steel
- Gate opening length, in fractional ft (Ex: 20 ft 6 inches = 20.5 ft)
- Weight of the cantilevered portion of the gate in pounds

What is an Ideal Configuration?

When you run a configuration, it ALWAYS returns a minimum length configuration for the weight and opening input. The tool available to manipulate, or optimize, the configuration is the weight. For a given opening size, increasing the weight will give a longer gate, an increased carriage spacing, and result in a configuration with higher capacity. We define an ideal configuration as one with a carriage spacing about 30% of the opening length. So, for a 20 ft (6m) opening, the ideal configuration would have a 6 ft (1.8m) carriage spacing. An ideal configuration gives you a gate operating on a foundation that is wide enough to eliminate visible "teeter-totter" effect as the gate cycles, and sturdy enough to reduce or eliminate mis-alignment issues that cause gates to get harder to open over time.

NOTE: *It is always ok to add extra weight to the configuration because this INCREASES the capacity of the system. It is NEVER ok to decrease the weight below the actual weight of the gate because this decreases the capacity and will lead to premature carriage or gate failure.*

Optimizing the configuration

Always begin with the actual opening size and weight of the gate cantilevered over the opening. Enter these specifications and proceed to the carriage selection page. Referring to the configuration instructions, choose a carriage that is available in the US. When you select a carriage, the page shows you the carriage spacing and total gate length. For example, for a Steel gate, 20 ft open, weighing 800 lbs:

NOTE: *If you proceed beyond the Carriage Selection Page, you cannot go back to the measurements page. So, do not move forward until you have optimized the configuration for the carriage you have chosen.*

The first step is to select a carriage to see what carriage spacing (interaxis) dimension is returned. Comunello has a range of 13 different steel carriages so usually more than one of them will be close to this optimum size and capacity. For this reason, you need to know which carriages are available through your supply chain and select accordingly. For this example, the configurator returns the following results for these three carriages:

Model	Configured Weight	Opening	(L)	Total (LT)	Length	Tail	Length	WT / FT	Interaxis (i)	i%
CGS-250.8M	800	240"	20'0"	358"	29'10"	9'10"	49%	40.0	8'1"	40%
CGS-250.8P	800	240"	20'0"	320"	26'8"	6'8"	33%	40.0	4'5"	22%
CGS-350.8P	800	240"	20'0"	305"	25'5"	5'5"	27%	40.0	3'1"	15%

The 250.8M will have a carriage spacing of 40% of the opening and the 250.8P has a 22% spacing. Either will work, and neither is "optimal". For an optimal configuration, picking the 250.8P carriage and padding the weight to 990 lbs gives a 28 ft gate with a 40% tail section (which is 2 ft shorter than top track hardware) and a spacing of 29%. This configuration gives a gate with 20% more capacity than needed and will extend the service life of the gate.

Model	Configured Weight	Opening	(L)	Total (LT)	Length	Tail	Length	WT / FT	Interaxis (i)	i%
CGS-250.8P	990	240"	20'0"	336"	28'0"	8'0"	40%	49.5	5'9"	29%

Optimizing the configuration for a longer gate than the minimum configuration

If your gate design calls for a typical 50% tail length, then you could pad the weight a little and use the 250.8M hardware. Adding 10 lbs to the configured weight gives a 30 ft gate with a wide carriage spacing. This meets the length required and gives a solid base for the gate.

Model	Configured Weight	Opening	(L)	Total (LT)	Length	Tail	Length	WT / FT	Interaxis (i)	i%
CGS-250.8M	810	240"	20'0"	360"	30'0"	10'0"	50%	40.5	8'3"	41%

Or if you want to add capacity (either for high cycle usage or a customer who prefers "over building"), you could choose the 250.8P carriage and pad the weight even more to get a similar configuration and gate size but with a higher weight capacity and likely a longer lifespan.

Model	Configured Weight	Opening	(L)	Total (LT)	Length	Tail	Length	WT / FT	Interaxis (i)	i%
CGS-250.8P	1220	240"	20'0"	360"	30'0"	10'0"	50%	61.0	7'8"	38%

Notice that in each case we increased the weight input to the configurator and did not decrease it.

What do you do to get a shorter gate?

If you have back side constraints that limit the space the gate opens into, then you need to design and configure a gate that will fit. Using the same example, but with a limitation of having only 25 ft of open space for the gate, you see from the initial table that none of these will work since the largest capacity carriage we looked at is the 350.8P and the total gate length is 25'5". But selecting the 350.8G gives us a gate that will fit the space, but with a very short carriage spacing.

Model	Configured Weight	Opening	(L)	Total (LT)	Length	Tail	Length	WT / FT	Interaxis (i)	i%
CGS-350.8G	800	240"	20'0"	299"	24'11"	4'11"	25%	40.0	1'8"	8%

This case worked out perfectly for the shorter gate, but usually choosing a larger carriage would still require padding the gate some to get the longest gate possible that will fit into the space available.

Summary thoughts:

- The configurator always returns a minimum length configuration for a given opening size and weight input.
- The weight input should be only the weight of the gate that is cantilevered over the opening, not the total weight of the gate. When fence contractors give you a weight estimate, it is usually a total gate weight estimate, so be sure to clarify when possible.
- Never use a weight that is lower than the actual gate weight over the opening.
- Carriage spacing is the key parameter to consider for a stable, working gate configuration and the optimum carriage spacing is 30% of the opening length.
    - To make the gate longer, choose a lighter duty carriage with gate length (Lt) shorter than desired, and pad the weight to get the length desired.
    - To make the gate shorter, choose a heavier duty carriage with gate length (Lt) shorter than desired, and pad the weight to get the length desired.
- For Integrator configurations using the 500 series carriages, use the corresponding 350 series carriages in the configurator:
    - The minimum carriage spacing for Integrator configurations is 30%, and longer is better.
- AIDI has written an instruction set for using the Comunello configurator and it shows the carriages available in the US and is available at this **link**.
- Contact your supplier to find out what carriages they stock and have available.