During his long and storied career, Daniel Buren has proved himself a past master in the art of appropriating public and private spaces. But the scope of the Grand Palais des Champs-Élysées’ annual Monumenta event—which since its inception in 2007 has invited a world-renowned contemporary artist to exploit a 13,500-square-meter space—isn’t without its risks.

So when he was offered the challenge of creating an artwork to fill the great nave of the Grand Palais, the 74-year-old French conceptual artist couldn’t refuse. “To my knowledge there is no place in the world as big as the Grand Palais where an artist can exhibit his work,”
says Mr. Buren, leaning forward conspiratorially over the table of a Paris café. “If my project is a success, then it will be a sparkling one; if it’s not, then I will be in the firing line.”

A world of artistic high stakes is one Mr. Buren has grown accustomed to, even relished. His first public work, commissioned in 1986 for the Cour d’Honneur of the French capital’s 17th-century Palais Royal, became a veritable affaire d’État.

Mr. Buren’s sculptural project “Les Deux Plateaux” (The Two Levels), consisting of multiple rows of different-sized stripy columns built on top of an underground fountain, was initially rejected for being “too modern and highly intellectual.”

It took a last-minute intervention by the culture minister of the day, Jack Lang, to save Mr. Buren’s project, which has since proved immensely popular and was given a much-needed makeover in 2010.

Mr. Buren’s latest creation is “in situ,” signifying something created on site as opposed to in a workshop. He began by developing this habit as a struggling young artist in Paris during the 1960s, when he couldn’t afford to hire a studio; since then it has become one of the hallmarks of his work. “Besides I have never liked the idea of being shut up in a workshop and having to contemplate a blank canvas,” he says. “Each work in situ provides a new intellectual game; every time there are new problems which need solving and which force you to think differently.”

The Monumenta installation’s full title is “Excentrique(s) Travail In Situ.” The first word has a loaded double meaning, conveying both “outlying” and “eccentric.” It is typical of the deliberate way Mr. Buren provides dialectic clues to the nature of his work. It also conjures up something of Mr. Buren’s own personality, which has never been in thrall to the prevailing winds of artistic conformity.

He was partly inspired for “Excentrique(s)” by leafing through a book of Arabian mathematical drawings from the 10th century.

One of the drawings depicting five concentric circles of differing diameters touching each other caught his attention: “I discovered that these clusters of circles can cover a far greater amount of space than any other geometric form.”

It was a Eureka-like moment for Mr. Buren who had spent several fruitless months trying to find a way to create something that wouldn’t be utterly overwhelmed by the volume of the Grand Palais’ nave and its massive glass, barrel-vaulted roof.

“I wanted something which would make the best possible use of the light and the volume of space provided me,” says Mr. Buren. “Parisian daylight has a very special quality—sometimes soft, sometimes hard—and when you’re under this amazing roof, there’s nothing obstructing it from flooding in. All the time I was thinking of ways of sculpting light and air.”

The next time I see Mr. Buren, he is in hands-on mode. Dressed in white overalls and patrolling the floor of the great nave, he is overseeing the installation of dozens of different-sized discs. One by one, a lift truck is placing them carefully on top of squared-off black-and-white-striped steel pillars.
Each disc is covered in a transparent plastic coating (either blue, green, yellow or red) which lets daylight filter through. Walking beneath them is like being in the midst of a fluorescent forest.

“From the beginning of my career I used color a bit like a weapon,” he says. “Conceptual art at the time had been influenced by American minimalism, which was almost always black and white,” he adds. “I introduced colored paper into my work as a statement that art didn't have to be taken seriously just because it was in black and white.”

Often referred to as “the stripe guy” by American art critics who homed in on his artworks using striped awning canvas or contrasting maxi stripes, in more recent years, Mr. Buren's work has become increasingly architectural and, indeed, monumental. “The Eye of the Storm,” his solo exhibition at the Guggenheim in New York in 2005, was notable for the creation of a massive mirrored tower that reinvented the contours of Frank Lloyd Wright's famous serpentine museum.

Though some criticized “The Eye of the Storm” as being over-reliant on gimmickry, it still attracted hundreds of thousands of curious visitors. Mr. Buren is sincerely hopeful that “Excentrique(s)” will prove equally popular. “I have always believed that a work of art has to be seen to exist,” he says. “It's only when an artwork has an audience that it has any meaning.”

There won't be a second chance. Like most of Mr. Buren's past installations, everything belonging to “Excentrique(s)” will be destroyed once Monumenta reaches its term on June 21.