

Smelting Workshop (*Takadono*)

The *takadono* workshop now stands quiet and still, but it was once the bustling center of activity at Sugaya Ironworks Village. Until 1921, while the site was still active, the furnace was torn down at the end of each operation and newly rebuilt before starting again. Each round of smelting lasted three days and three nights, during which the workers barely slept. Under the watchful eyes of the *murage* (foreman), crews worked in rotation to tend to the furnace and pump the bellows.

Feeding the furnace was the critical task of the *murage* and his assistants, who alternated adding small quantities of iron sand or charcoal to the roaring flames. There was no manual that explained the precise amount and timing of these additions; successful operation of the furnace depended entirely on the *murage*'s expertise in judging the progress based on colors, sounds, and smells.

The bellows in the workshop date from 1906 and were powered by a waterwheel that drove the pistons and propelled air through underground pipes into the furnace. Prior to 1906, air was supplied by large, foot-operated bellows connected to either side of the furnace. The bellows were driven by a pair of workers who stood atop them, working the foot pedals in a steady rhythm.

With the added air from the bellows, the flames of the furnace reached more than a meter in height. The open sections of the workshop's roof prevented the building from catching fire, and they also allowed smoke to dissipate and be carried away by the mountain breeze.

Layout of the *Takadono*

The current *takadono* was rebuilt after it burned down in 1851, and the rectangular clay furnace in the middle of the workshop was constructed in 1967. The square, single-story building measures roughly 18 meters on each side. Its roof reaches a height of 9 meters and is supported by the four pillars that surround the furnace in the middle of the workshop.

The elevated platforms on the left and right (when facing the furnace from the building's entrance) were areas where the *murage* and the seniormost workers could rest during the multiday smelting process. The area directly behind the furnace was occupied by a stockpile of iron sand, while charcoal was stored in two large piles on either side.

Although it is not visible, an important feature of the workshop is the underground structure beneath the furnace. After the *takadono* had been built, workers dug a 3-meter hole where the furnace would eventually be added. Within that hole they constructed three stone-lined compartments: one large pit directly beneath the furnace, which was filled with charcoal, and two small chambers that were left empty. The purpose of these cavities was to reduce heat dissipation and remove moisture from the surrounding dirt. Excess moisture could lower the temperature inside the furnace or, even worse, evaporate and cause a steam explosion.