

斜風対応型吹き払い柵の開発

Blower Snow Fence for Winds with a Broad Angles of Incidence

積雪寒冷地における上下二車線の道路には路側に設置可能な吹き払い柵が用いられることが多くあります。しかし、吹き払い柵は風が柵に対して斜めから入射した場合や、積雪により下部間隙が狭められた場合に、防雪効果が低下することが明らかとなっていました。

そこで寒地土木研究所では、従来柵と同様に道路敷地内に設置可能で、風が斜めから入射する場合や柵下部間隙の閉塞時においても著しく防雪効果が低下しない斜風対応型吹き払い柵を開発しました。(特許番号:5610251)

Along two-lane roads in snowy cold regions, a "blower snow fence", which can be installed at the immediate roadside, is frequently used. However, it was clarified that the snow-control performance of the blower snow fence decreases when the incident wind is oblique or when the bottom clearance of the fence is narrowed by snow accumulated below the fence. To solve such problems, the Civil Engineering Research Institute for Cold Region has developed a blower snow fence for winds with a broad angles of incidence in the right of way in a similar way to that of conventional snow fences but whose snow control performance does not markedly decrease even when the incident winds are oblique or when the bottom clearance is blocked. (Patent Number: 5610251)



概要

Overview

斜風対応型吹き払い柵は凹凸状に加工した縦長の防雪板を横方向に隙間無く列設した防雪柵です。傾斜した防雪板で風の流れを下向きに変え、視程障害を緩和します。同時に、高さ1m程度下部間隙から吹き出す強風により道路上の雪を吹き払います。また、路側に設置可能です。

The blower snow fence for winds with a broad angles of incidence is a fence made of long vertical snow control plates with a v-shaped cross-section butted close together. The fence mitigates visibility hindrance by using slanted snow control panels to divert the wind downward. Strong winds blowing through the bottom clearance of about 1m in height blow snow from the road. The fence can be installed at the immediate roadside.

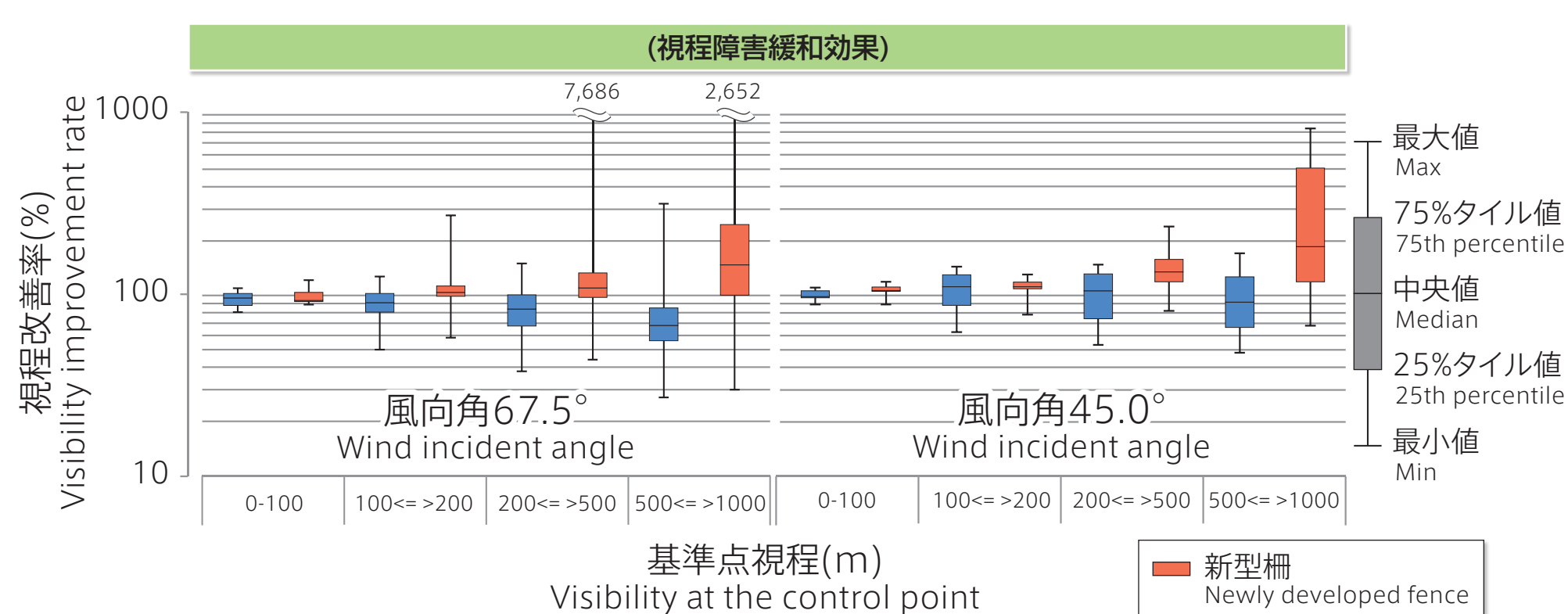
野外観測による実証試験

Demonstration experiment by onsite observation

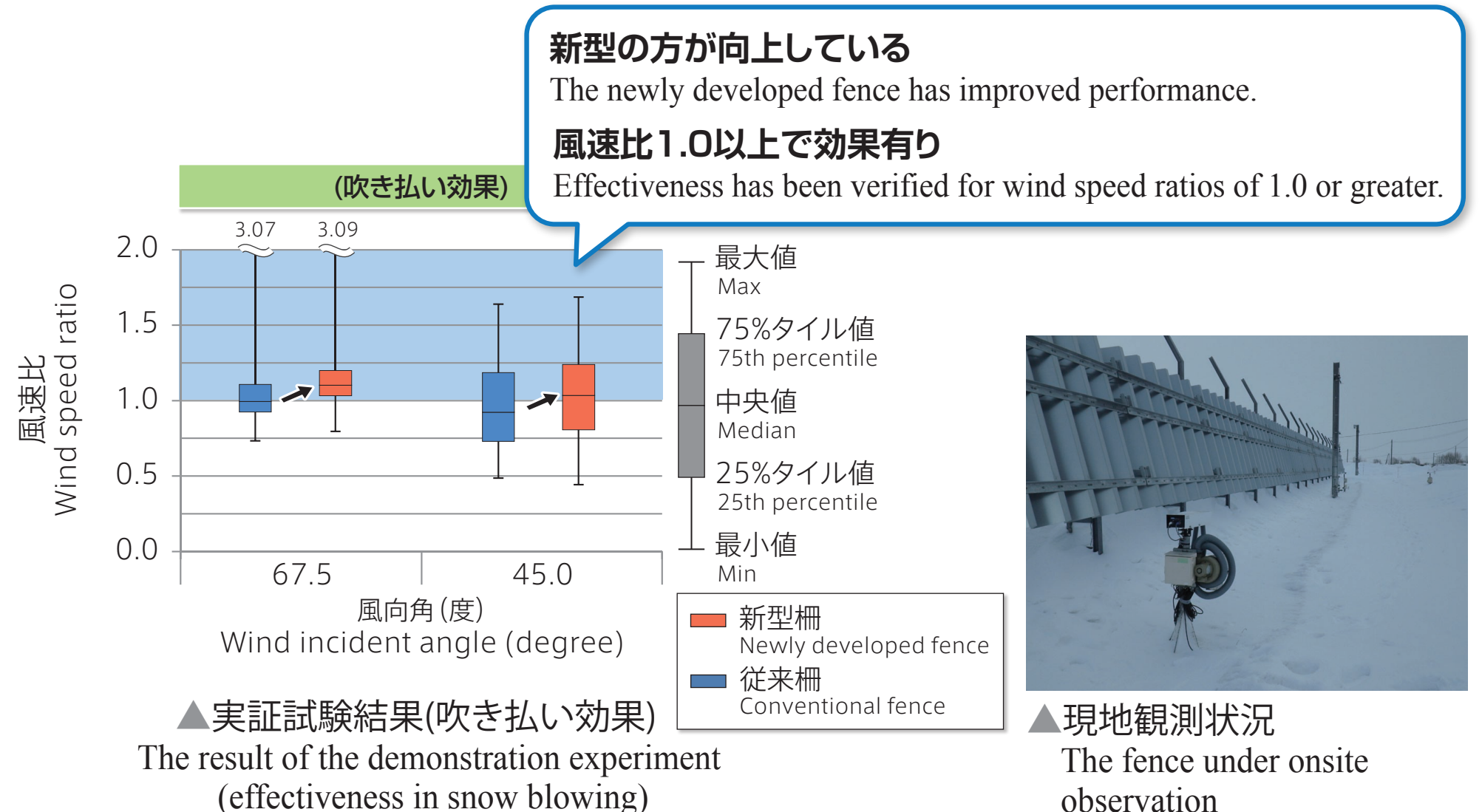
斜風対応型吹き払い柵の防雪機能を確認するため、実物大の柵を約50m製作し、野外フィールドに設置して実証試験を行いました。

その結果、斜風対応型吹き払い柵は従来型の柵と同等以上の防雪機能を有し、風が斜めから入射した場合でも効果を発揮することが確認できました。

To verify the snow control performance of the blower snow fence for winds with a broad angles of incidence, a full-scale fence of about 50m in length was produced, and a demonstration experiment was done by installing the fence in the field. The experiment clarified that the blower snow fence for winds with a broad angles of incidence has an equal to or greater snow control performance than that of the conventional snow fence and that the fence was effective even in oblique winds.



The result of the demonstration experiment (effectiveness in visibility hindrance mitigation)



特長

Advantage

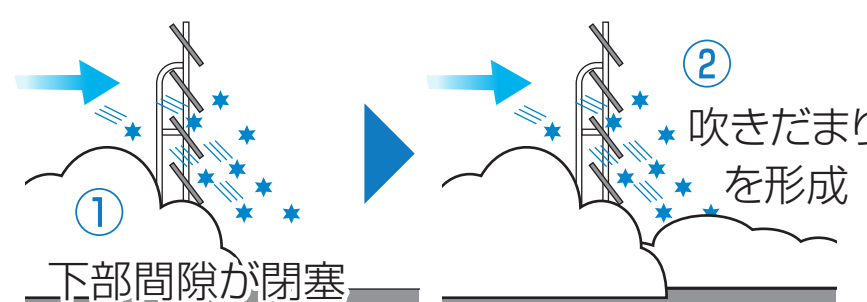
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下部間隙閉塞時に柵風上側に雪を溜めるため、道路上に吹きだまりを生じさせない。

Snowdrifts do not form easily on the road, because the fence accumulates snow on its windward side when the bottom clearance is blocked.

●従来型

Conventional fence



1. When the bottom clearance is blocked
2. Snowdrifts form.

下部間隙が塞がると、道路上に吹きだまりを形成する。

When the bottom clearance is blocked, snowdrifts form on the road.

●斜風対応型吹き払い柵

The blower snow fence for winds with a broad angles of incidence

・下部間隙非閉塞時

- When the bottom clearance is not blocked

道路上の雪粒子を吹き払う

The wind blows the snow particles off the road.

柵風上に雪粒子を捕捉

The fence traps the snow particles on its windward side.

・下部間隙閉塞時

- When the bottom clearance is blocked

柵風上に雪粒子を捕捉

The fence traps the snow particles on its windward side.

特長

Advantage

2

凹凸状防雪板の採用により、斜めから入射した風を下方向に誘導。

The v-shaped snow control plates divert oblique incident winds downward.

縦張りに設置した凹凸状の防雪板は、斜めから入射した風を下部間隙に導くことが可能です。The vertical v-shaped snow control plates divert oblique winds to the bottom clearance.

●従来型の防雪板

- Conventional snow control panel

風が横に逃げる

There is less snow blowing effect.

●新型柵の防雪板(凹凸状)

- Newly developed snow control plate (v-shaped)

風を逃がさず誘導することが可能

The plate can redirect all the wind downward.

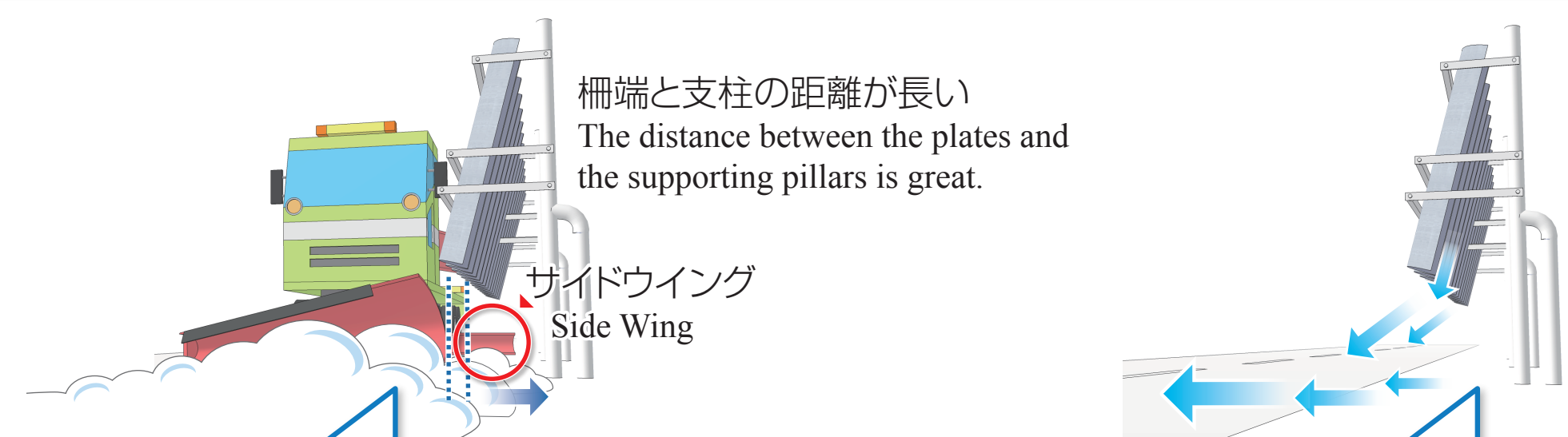
特長

Advantage

3

防雪板を支柱から離して設置するため、下部間隙の機械除雪が容易。

Mechanized removal of snow at the bottom clearance is easy because the snow control plates are installed at a certain distance from the supporting pillars.



サイドウィングが支柱と接触せず、機械を使用した効率的な除雪が可能です。

The clearance between the plates and the supporting pillars makes it possible for snow to be efficiently removed by snowplow.

防雪柵の下部間隙の開放により、吹き払い機能が回復します。

The snow control performance of the fence is restored by reopening the bottom clearance.