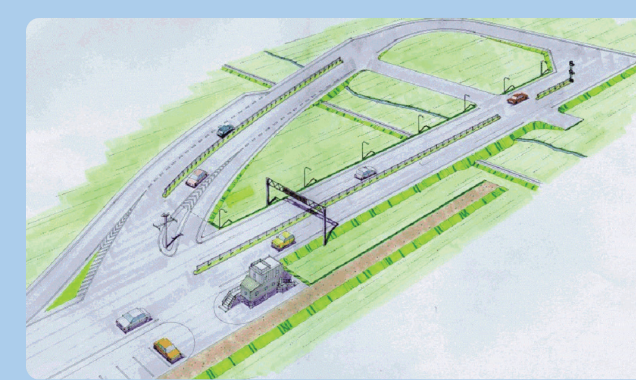




石狩吹雪実験場の概要 北ゾーン

Outline of the Ishikari Blowing-Snow Test Field: The North Zone

石狩吹雪実験場は、札幌市中心部から北方約 17km の石狩川下流部旧河川敷に位置します。この地域は、冬期に強い北西の季節風を受けて北海道内でも吹雪頻度が最も高い地域のひとつです。このため、一般道では実験実施困難なフルスケールでの吹雪や視程障害に対する走行実験が可能です。実験場内は、吹雪対策施設や吹きだまりの実験を行う「南ゾーン」と試験走行路を中心とした「北ゾーン」に分かれています。



The Ishikari Blowing-Snow Test Field is about 17 km north of downtown Sapporo. The test field was constructed on a dry riverbed at the lower reaches of the Ishikari River. This area frequently has strong northwesterly winds in winter. Its frequency of snowstorm occurrence is among the highest in Hokkaido. The natural conditions of the test field enable tests, including those on driving in snowstorm or poor visibility, that are difficult on roads in service. The South Zone is installed with a various blowing-snow countermeasures applied track and a snowdrift test track. The North Zone is installed with a test track.

北ゾーンの概要

The North Zone

北ゾーンは、1 周 800m の試験走行路や気象観測装置等で構成され、吹雪による視程障害下での視線誘導施設や車両等の視認性の調査、気象条件と視程障害の関係解明に向けた調査などを行っています。また、吹雪室内実験装置では、防雪柵や防雪林等の吹雪対策施設に関する実験を行なっています。

Installed with the 800 m test track and various weather observation instruments, investigations on the visibility of delineation facilities and vehicles under poor visibility conditions in blowing snow are done in the zone. Elucidation of the relationship between weather conditions and poor visibility is included in the investigations done on the track. The indoor wind tunnel is used for experiments related to snowstorm countermeasure facilities, including snowfences and snowbreak woods.

< 沿革 >

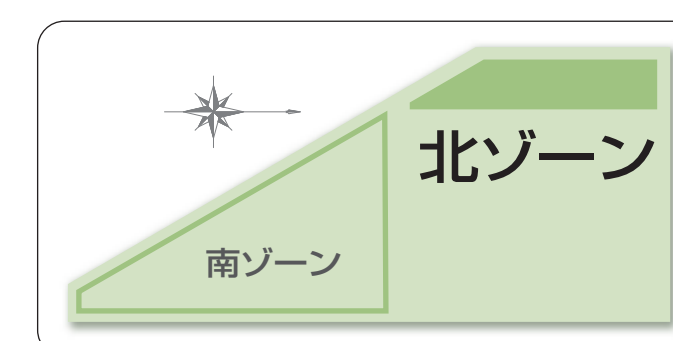
- ・ S63 石狩実験場にて研究開始
- ・ H7 吹雪観測棟整備
- ・ H8 試験走行路整備 (直線部)、気象観測機器再整備
- ・ H9 落石雪崩実験装置、試験走路門型柱設置
- ・ H13 試験走行路周回部完成、吹雪観測棟移設、PIARC 冬期道路 AHS デモ
- ・ H21 直線路 舗装打替、データ処理棟整備
- ・ H22 吹雪室内実験装置設置

< 諸元データ等 >

- ・ 本線：暫定 2 車線 簡易分離
- ・ 周回延長：L= 約 800m
- ・ 道路延長：直線部 L=300m：曲線部 L=500m
- ・ 道路幅員：W=15m

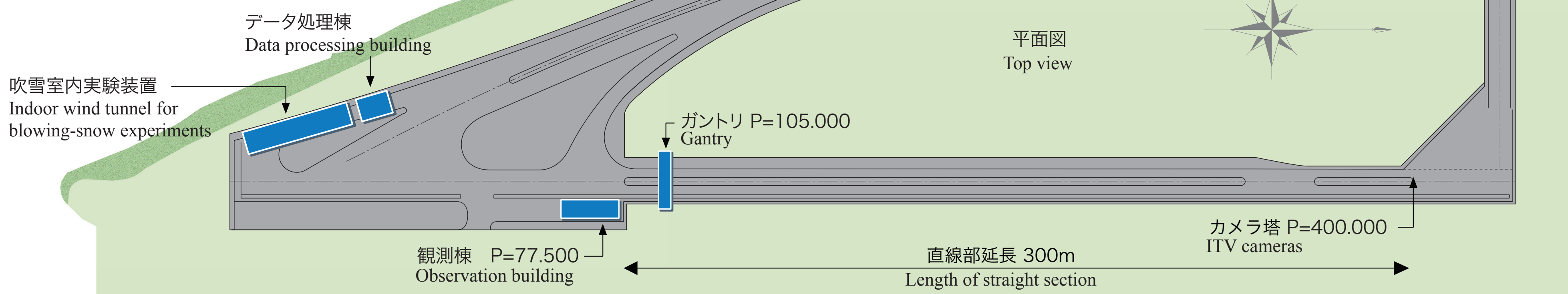
Facility dimensions

- Circuit track: two temporarily divided lanes
- Circuit track length: 800 m
- Straight section: 300 m; curved section: 500 m
- Track width: 15 m



History

- 1988: Studies start at the test field.
- 1995: The Blowing-Snow Observation Building is completed.
- 1996: The test track (straight section) is completed; weather observation instruments are renewed.
- 1997: Rock fall test equipment and a gantry on the test track are completed.
- 2001: The curves that connect the straight sections are completed; the Blowing-Snow Observation Building is moved; an AHS demonstration for the PIARC Winter Road Congress is conducted.
- 2009: The straight sections are repaved; the Data Processing Building is completed.
- 2010: The indoor wind tunnel for blowing-snow experiments is completed.



本実験場には次のような実験観測施設が整備されています。

- 気象測器 (風向風速計、雨量計、視程計、積雪深計)
- 道路照明
- 視程板
- 吹雪室内実験装置
- I T V カメラ
- 録画装置
- 吹雪粒子計 (SPC)
- 道路情報板
- データ処理棟
- 固定式視線誘導柱
- 観測棟

The following experiment and observation facilities are at the field.

- Weather station (aerovane, precipitation meter, visibility meter, snow depth meter)
- ITV cameras
- Road lighting
- Video recorder
- Variable message board
- Fixed-post delineators with arrow-shaped pointers
- Visibility boards
- Snow particle counter (SPC)
- Data processing building
- Observation building
- Indoor wind tunnel for blowing-snow experiments

実験状況

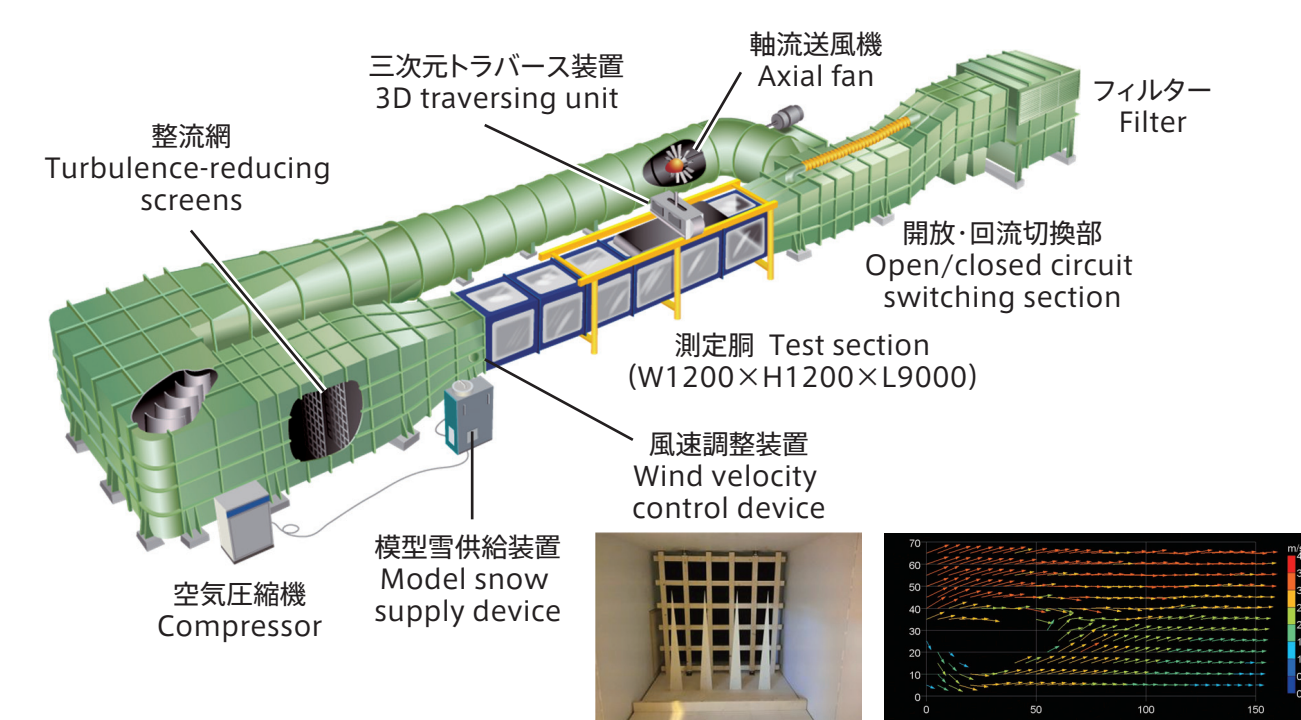
Experiments at the Test Field



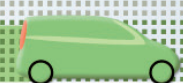
気象条件と視程障害の関係解明に向けた調査
Investigation of the relationship between weather conditions and visibility hindrances



視線誘導施設や車両の視認性調査
Test on visibility of several types of delineators and cars in blowing snow



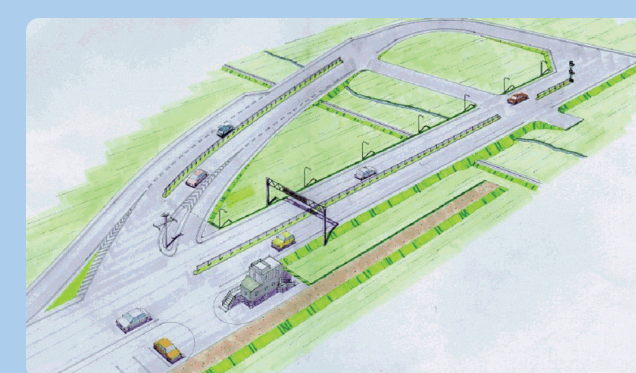
吹雪室内実験装置による防雪柵の性能評価試験
Performance evaluation of snowfences using the indoor wind tunnel



石狩吹雪実験場の概要 南ゾーン

Outline of the Ishikari Blowing-Snow Test Field: The South Zone

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南ゾーンの概要 The South Zone

南ゾーンは、道路防雪林の育成施設、防雪柵の実験施設、吹きだまり試験道路、二重柵基準降水量計で構成され、道路防雪林の造成手法、防雪柵の性能評価、吹雪対策技術の開発、吹きだまり災害の防止に関する調査などを行っています。

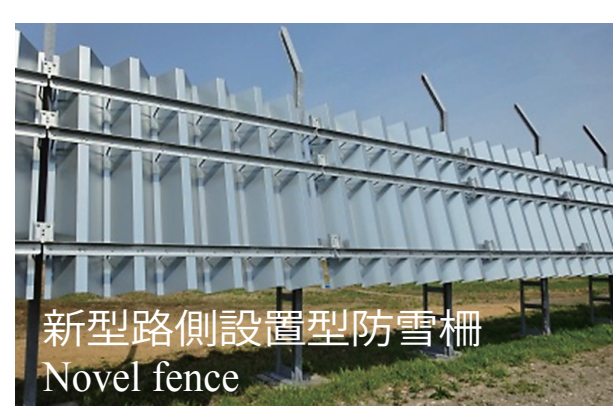
The South Zone includes the Snowbreak Woods Cultivation Test Area, an experiment facility for snowfences, a test track for snowdrift experiments and a Double Fence Intercomparison Reference precipitation gauge. The development of methods for creating road snowbreak woods, evaluating the performance of snowfences, developing technologies for blowing-snow countermeasures, and investigating the prevention of snowdrift disasters are conducted in this zone.

防雪柵の実験施設

防雪柵は、風を弱めたり、方向を調整することによって道路上の吹きだまりを防ぎ吹雪時の視程を改善する施設です。ここでは防雪柵の機能を評価するため、吹きだまり形状や道路上での視程を計測しています。

Snowfence Experiment Facilities

Snowfences attenuate or redirect winds in order to reduce snowdrifts on roads and improve visibility during blowing snow. To evaluate the performances of such fences, the shapes of snowdrifts and visibility on a test track section are measured.



吹きだまり試験道路

切土道路では盛土道路に比べて吹きだまりが発生しやすくなります。ここでは道路構造による吹きだまり形状や速度の違いを把握し、災害を未然に防ぐための調査を行います。

Snowdrift Experiment Road

Snowdrifts form more often on the cut sections of a road than on the fill sections. On this test track, investigations for preventing disasters caused by snowdrifts are done through experiments to understand the relationship between the road structure and the shape of resulting snowdrifts and the difference between the speeds of snowdrift formation at the two sections.



吹雪量等自動連続観測システム

風速計、吹雪粒子計数装置等を鉛直方向に設置した観測塔4基で構成し、吹雪量等の観測を行っています。

The Automated Continuous Snowdrift Transport Rate Observation System

Four observation towers vertically installed with multiple sensors, including wind velocity meters and blowing-snow particle counters, are used for observation of the snowdrift transport rate.

二重柵基準降水量計(DFIR)

風が強くなると、降雪粒子は降雪量計に入りにくくなるため、正確な降水量を計測することが難しくなります。ここでは、世界気象機関(WMO)が推奨する降水量計を用いて降雪量をより精度良く計測しています。

Double Fence Intercomparison Reference (DFIR)

When the wind is strong, the falling snow particles do not enter the snowfall gauge easily, and accurate measurement of precipitation becomes difficult. Here, the snowfall is accurately measured by using a snowfall gauge recommended by the World Meteorological Organization (WMO).

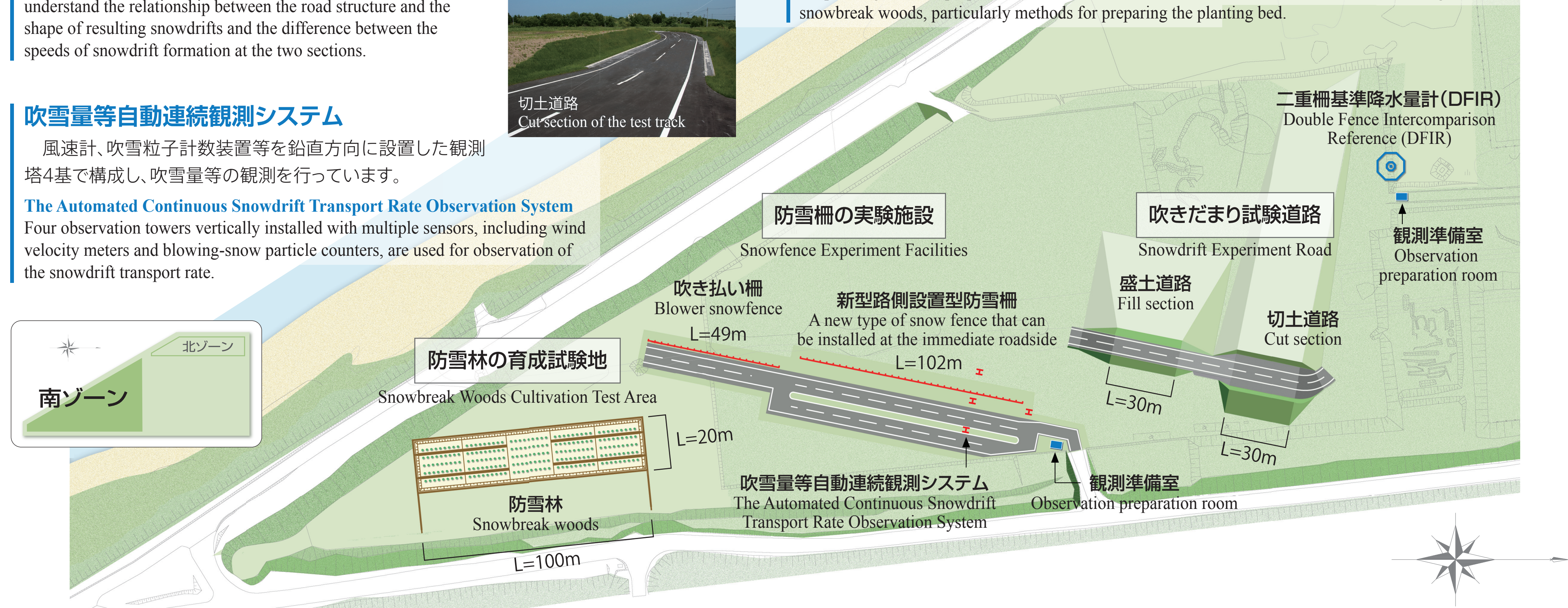


防雪林の育成試験地

道路防雪林は、吹雪対策として整備が進められていますが、植栽後生育不良となる樹木も見られます。その一因は生育基盤の構造と考えられており、ここでは生育基盤の造成手法を中心に、防雪林の育成管理に関する研究を行います。

Snowbreak Woods Cultivation Test Area

The installation of snowbreak woods for roads has been promoted as a blowing-snow countermeasure. However, some of the trees in such planted forests have shown insufficient growth. One possible reason is how the planting bed was prepared. In the test area, studies are conducted on the cultivation management of snowbreak woods, particularly methods for preparing the planting bed.



< 沿革 >

- ・ H14 南ゾーン使用開始、吹き払い柵の開発試験 (H14-16)
- ・ H17-18 防雪柵設置 (吹き止め柵)
- ・ H21 防雪林試験地、切土道路・盛土道路新設、防雪柵増設 (吹き払い柵)
- ・ H26 吹雪量等自動連続観測システム、二重柵基準降水量計新設、防雪柵 (新型路側設置型) 増設

History

- 2002: The South Zone enters use; experiments are conducted for the development of blower snowfences (2002 – 2004).
- 2005, 2006: Snowfences are installed (collector upwind snowfences).
- 2009: The Snowbreak Woods Cultivation Test Area, a test track with cut and fill earthworks is completed; additional snowfences are installed (blower snowfences).
- 2014: An automated continuous snowdrift transport rate observation system and a Double Fence Intercomparison Reference precipitation gauge were newly installed, and a snow fence (a new type that can be installed at the immediate roadside) was expanded.

< 諸元データ等 >

- ・ 防雪林試験地 20m×100m
- ・ 新型路側設置型防雪柵 102m、吹き払い柵 49m
- ・ 吹きだまり試験道路 盛土部 L=30m、切土部 L= 30m
- ・ 二重柵基準降水量計 幅 12m、高さ 4m

Facility dimensions

- Snowbreak Woods Cultivation Test Area: 20 m x 100 m
- Snowfences: A new type of snow fence that can be installed at the immediate roadside: 102 m
Blower snowfence: 49 m
- Snowdrift Experiment Track: Fill section: 30 m
Cut section: 30 m
- Double Fence Intercomparison Reference: Width: 12 m
Height: 4 m