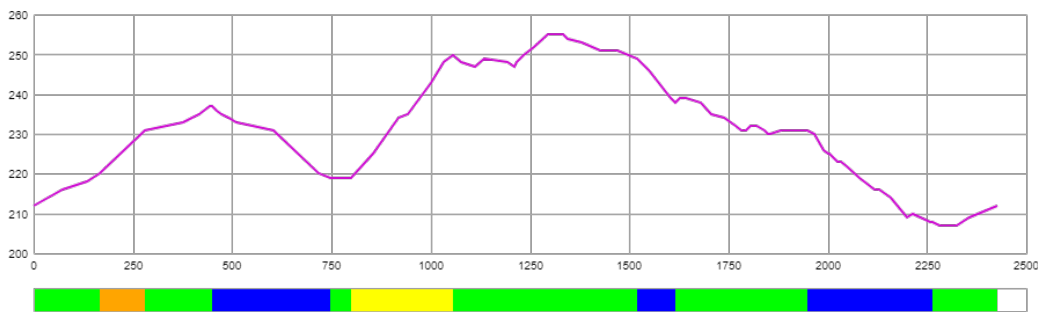




**CERTIFICATE
OF FIS HOMOLOGATED CROSS-COUNTRY COURSE
FIS CROSS-COUNTRY COMMITTEE**

| | |
|---|----------------------------------|
| (1) Registration number: | 21/64.02/2.5 |
| (2) Name of the competition site: | Grand Avenue Nordic Center |
| (3) Name of city/region: | Duluth, Minnesota |
| (4) Organizer: | Duluth Cross Country Ski Club |
| (5) National ski association: | US Ski and Snowboard Association |
| (6) Contact person in the organizing committee: | Gary Larson & Siri Morse |
| (7) Homologation inspector: | Allan Serrano |
| (8) Name of course: | 2.5km |
| (9) Competition level for course | COC |

| | | | | | |
|------------------|--------|-------------------------|-----|----------------|------|
| Course length: | 2,426m | Height difference (HD): | 48m | Lowest point: | 207m |
| Course category: | D | Maximum climb (MC): | 31m | Highest point: | 255m |
| | | Total climb (TC): | 75m | | |



A-climb B-climb C-climb descent undulated terrain




FIS Office


Mignerey, Pierre
FIS International Ski Federation
Blochstrasse 2 / Postfach
CH - 3653 Oberhofen

FIS Stamp



FIS Homologation
Responsible


Maddox, AI

Date of Issue

24.11.2021
Valid until
30.06.2026

(10) Overview of the uphill:

| | No. | PTC | % of TC |
|---------------------|-----|-----|---------|
| - major climbs | 1 | 31 | 41.3 |
| - shorter climbs | 1 | 11 | 14.7 |
| - descents | 3 | 1 | 1.3 |
| - undulated terrain | 6 | 32 | 42.7 |

(11) Stadium area:

| | | Indoor working room: | |
|--|-----|----------------------|-----|
| Fixed stadium area | yes | Timekeeping | no |
| Fixed building | yes | Announcer | no |
| Temporary stadium | no | Jury | yes |
| Temporary building | no | Race office | yes |
| Good infrastructure (access, parking, media, etc.) | yes | | |
| Skitesting area along course/near stadium | no | | |
| Warm up track near the stadium | no | | |

(12) Category for the stadium and course layout:

| | Interval | Sprint | Skiathlon | Relay | Mass start |
|--|----------|--------|-----------|-------|------------|
| Stadium suitable for following competition formats | yes | yes | | | yes |
| Course suitable for following competition formats with | | | | | |
| a) Classical technique | yes | | | | yes |
| b) Free technique | yes | | | | yes |
| Course suitable for relay and skiathlon competition | | | | | |
| a) On same course | | | | | |
| b) Combined on different courses (C+D or D+D) | | | | | |

(13) Possibility of snow making:

Snowmaking infrastructure is available on the entire course with the exception of the segment from 1200 to 1500 m.

(14) Map Material:

Excellent

(15) Source of accurate elevation data:

Bare earth LIDAR 2019

(16) Safety considerations:

The competition courses occupy nearly all of the space available at the venue. Care must be taken in controlling access to the competition course for wax testing and warming up on course. The course access point nearest the Team Area is at the bottom of a high speed downhill. The only warm-up area available is on the competition course or on some trails that require crossing the competition course for access. These areas need to be controlled.

(17) General remarks:

The course meets the minimum requirements for TC, but has a strong A climb and near maximum HD. It is not ideal that the UT is over-represented as a percentage of the TC (42.7). The slopes in the first 500 m of the course are just below meeting the climb definitions. From the start to the first high point the course gains 25 m at just under 6% average slope. On subsequent laps, the course gains 29 m each lap at the same slope. This is a good profile for lower levels, but not for the highest levels.

A Diagonal Technique Zone should be considered for high-level classic competitions. The upper segment of the A climb is a good location for this.

On course wax testing can be arranged on the first downhill with the noted safety concerns.

(18) Date of first inspection:

(19) Date of final inspection: 2021/9/6

(20) Summary of terrain characteristics

| | # | at m | PHD (m) | PTC (m) | grad. (%) | avg. grad.(%) | |
|-------------------|-------------|------|---------|---------|------------|---------------|------------------|
| A-climb | 1 | 799 | 31 | 31 | 4.4 - 15.4 | 12.1 | |
| | total | | | 31 | | | 41.3% part of TC |
| B-climb | 1 | 167 | 11 | 11 | 9.7 - 9.7 | 9.6 | |
| | total | | | 11 | | | 14.7% part of TC |
| C-climb | total | | | 0 | | | 0.0% part of TC |
| undulated terrain | total | | | 32 | | | 42.7% part of TC |
| | total climb | | | 75 | | | |