

Project Name: Sport Ireland - Pavilion Building - Final
Offer no.: Pavilion Building

07/05/2026

Documentation- Pavilion Building

Customer Details

Company	Sport Ireland
Customer Number	
Contact person	
Address	Sport Ireland Campus, Snugborough Road, Blanchardstown, Dublin 15 D15 EPN4
Phone	
Fax	
E-Mail	

Project Data

Project Name	Sport Ireland - Pavilion Building - Final
Offer no.	Pavilion Building
Project Designer	
Address	Sport Ireland Campus, Snugborough Road, Blanchardstown, Dublin 15 D15 EPN4



Project Description:
MIC 140kVA

Project Overview



Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances and Battery Systems

Climate Data	Dublin Airport, IRL (2001 - 2020)
Values source	Meteonorm 9.0
PV Generator Output	56.32 kWp
PV Generator Surface	255.8 m ²
Number of PV Modules	128
Number of Inverters	2
No. of battery systems	3

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

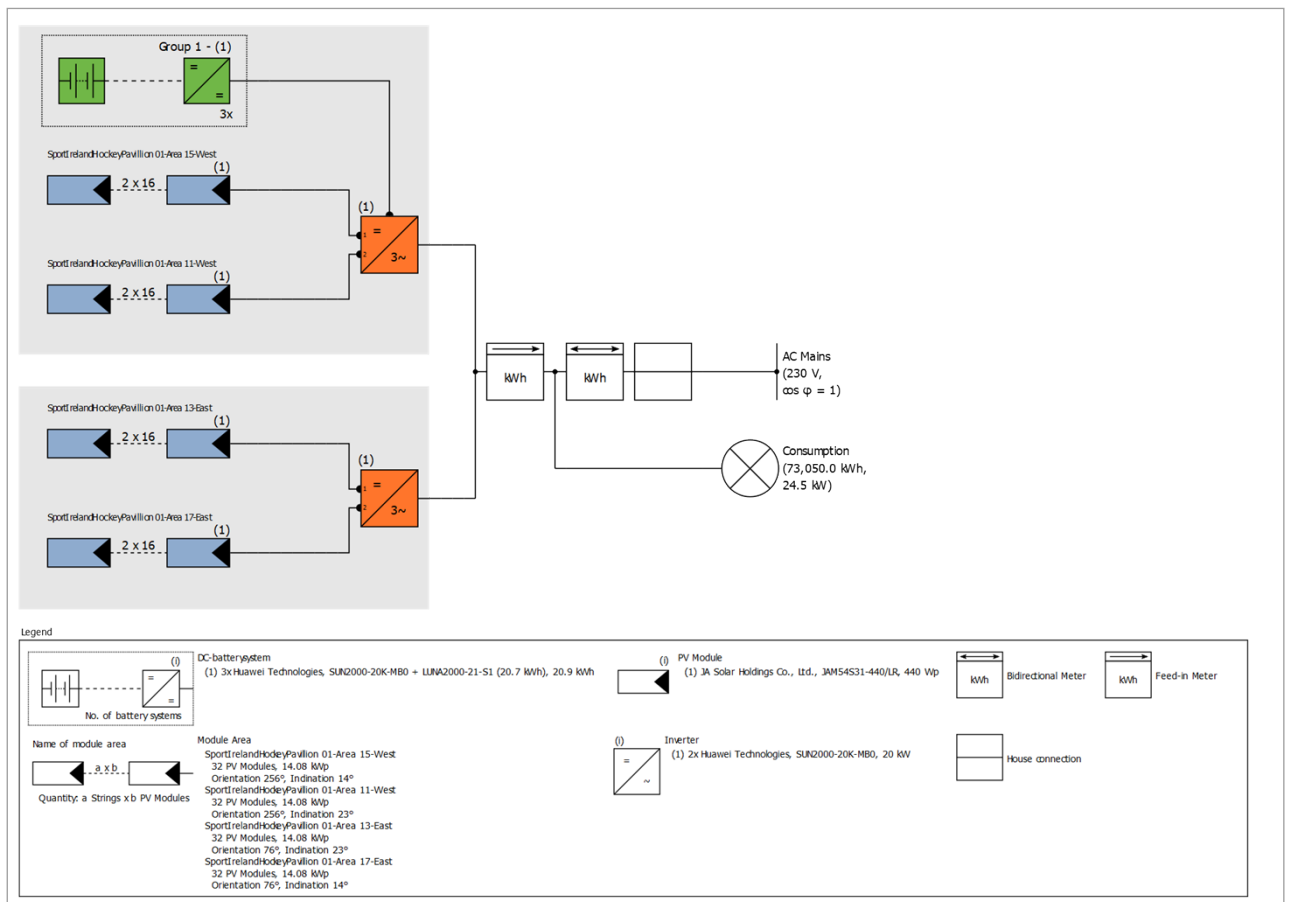


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	56.32 kWp
Spec. Annual Yield	873.50 kWh/kWp
Performance Ratio (PR)	92.00 %
Yield Reduction due to Shading	0.0 %
PV Generator Energy (AC grid) with battery	48,404 kWh/Year
Direct Own Use	33,537 kWh/Year
Grid Export	14,867 kWh/Year
Own Power Consumption	69.3 %
CO ₂ Emissions avoided	18,121 kg / year
Level of Self-sufficiency	45.9 %

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	3D, Grid-connected PV System with Electrical Appliances and Battery Systems
Start of Operation	12/03/2026

Climate Data

Location	Dublin Airport, IRL (2001 - 2020)
Values source	Meteonorm 9.0
Data resolution	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Consumption

Total Consumption	73050 kWh
252010 - Hockey Pavillion	73050 kWh
Load Peak	24.5 kW

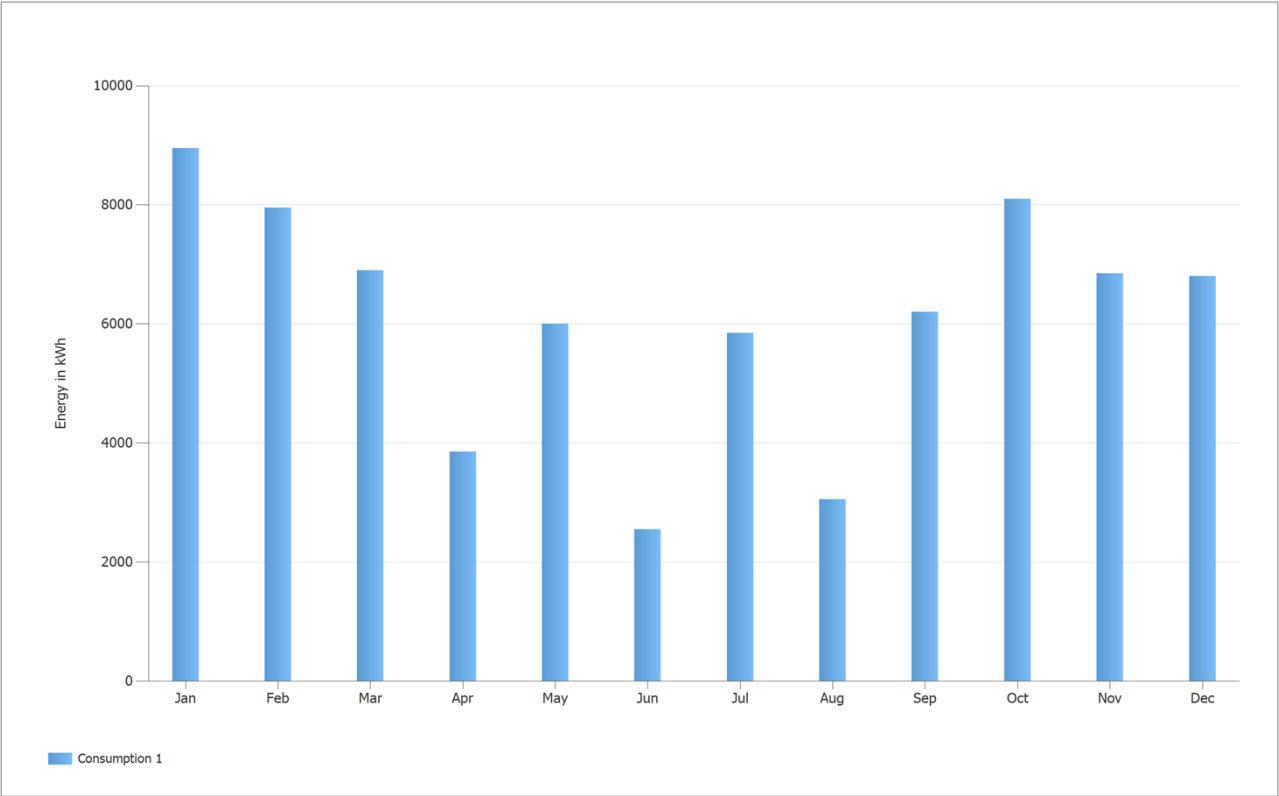


Figure: Consumption

Module Areas

1. Module Area - SportIrelandHockeyPavillion 01-Area 15-West

PV Generator, 1. Module Area - SportIrelandHockeyPavillion 01-Area 15-West

Name	SportIrelandHockeyPavillion 01-Area 15-West
PV Modules	32 x JAM54S31-440/LR (v1)
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	14 °
Orientation	West 256 °
Installation Type	Roof parallel
PV Generator Surface	63.9 m ²



Figure: 1. Module Area - SportIrelandHockeyPavillion 01-Area 15-West

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

2. Module Area - SportIrelandHockeyPavillion 01-Area 11-West

PV Generator, 2. Module Area - SportIrelandHockeyPavillion 01-Area 11-West

Name	SportIrelandHockeyPavillion 01-Area 11-West
PV Modules	32 x JAM54S31-440/LR (v1)
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	23 °
Orientation	West 256 °
Installation Type	Roof parallel
PV Generator Surface	63.9 m ²



Figure: 2. Module Area - SportIrelandHockeyPavillion 01-Area 11-West

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

3. Module Area - SportIrelandHockeyPavillion 01-Area 13-East

PV Generator, 3. Module Area - SportIrelandHockeyPavillion 01-Area 13-East

Name	SportIrelandHockeyPavillion 01-Area 13-East
PV Modules	32 x JAM54S31-440/LR (v1)
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	23 °
Orientation	East 76 °
Installation Type	Roof parallel
PV Generator Surface	63.9 m ²



Figure: 3. Module Area - SportIrelandHockeyPavillion 01-Area 13-East

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

4. Module Area - SportIrelandHockeyPavillion 01-Area 17-East

PV Generator, 4. Module Area - SportIrelandHockeyPavillion 01-Area 17-East

Name	SportIrelandHockeyPavillion 01-Area 17-East
PV Modules	32 x JAM54S31-440/LR (v1)
Manufacturer	JA Solar Holdings Co., Ltd.
Inclination	14 °
Orientation	East 76 °
Installation Type	Roof parallel
PV Generator Surface	63.9 m²



Figure: 4. Module Area - SportIrelandHockeyPavillion 01-Area 17-East

Inverter configuration

Configuration 1

Module Areas	SportIrelandHockeyPavillion 01-Area 15-West + SportIrelandHockeyPavillion 01-Area 11-West
Inverter 1	
Model	SUN2000-20K-MB0 (v1)
Manufacturer	Huawei Technologies
Quantity	1
Sizing Factor	140.8 %
Configuration	MPP 1: 2 x 16 MPP 2: 2 x 16

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

Configuration 2

Module Areas	SportIrelandHockeyPavillion 01-Area 13-East + SportIrelandHockeyPavillion 01-Area 17-East
Inverter 1	
Model	SUN2000-20K-MB0 (v1)
Manufacturer	Huawei Technologies
Quantity	1
Sizing Factor	140.8 %
Configuration	MPP 1: 2 x 16 MPP 2: 2 x 16

AC Mains

AC Mains

Number of Phases	3
Mains voltage between phase and neutral	230 V
Displacement Power Factor (cos phi)	+/- 1

Battery Systems

Battery System - Group 1

Model	SUN2000-20K-MB0 + LUNA2000-21-S1 (20.7 kWh) (v3)
Manufacturer	Huawei Technologies
Quantity	3
Battery Inverter	
Type of coupling	DC intermediate circuit coupling
Nominal output	10.5 kW
Battery	
Manufacturer	Huawei Technologies
Model	LUNA2000-7-E1 (v1)
Quantity	3
Battery Energy	20.9 kWh
Battery Type	Lithium iron phosphate

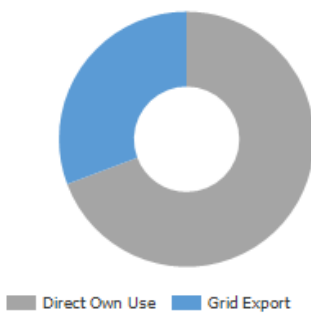
Simulation Results

Results Total System

PV System

PV Generator Output	56.32 kWp
Spec. Annual Yield	873.50 kWh/kWp
Performance Ratio (PR)	92.00 %
Yield Reduction due to Shading	0.0 %
PV Generator Energy (AC grid) with battery	48,404 kWh/Year
Direct Own Use	33,537 kWh/Year
Grid Export	14,867 kWh/Year
Own Power Consumption	69.3 %
CO ₂ Emissions avoided	18,121 kg / year

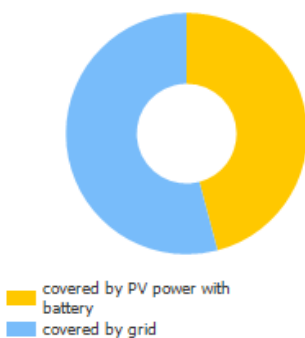
PV Generator Energy (AC grid) with battery



Appliances

Appliances	73,050 kWh/Year
Standby Consumption (Inverter)	43 kWh/Year
Total Consumption	73,093 kWh/Year
covered by PV power with battery	33,537 kWh/Year
covered by grid	39,557 kWh/Year
Solar Fraction	45.9 %

Total Consumption



Battery System

Charge at beginning	63 kWh
Battery Charge (PV System)	10,237 kWh/Year
Battery Energy for the Covering of Consumption	9,402 kWh/Year
Battery discharge into the grid	225 kWh/Year
Losses due to charging/discharging	516 kWh/Year
Losses in Battery	157 kWh/Year
Cycle Load	3.0 %
Service Life	>20 Years

Level of Self-sufficiency

Total Consumption	73,093 kWh/Year
covered by grid	39,557 kWh/Year
Level of Self-sufficiency	45.9 %

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

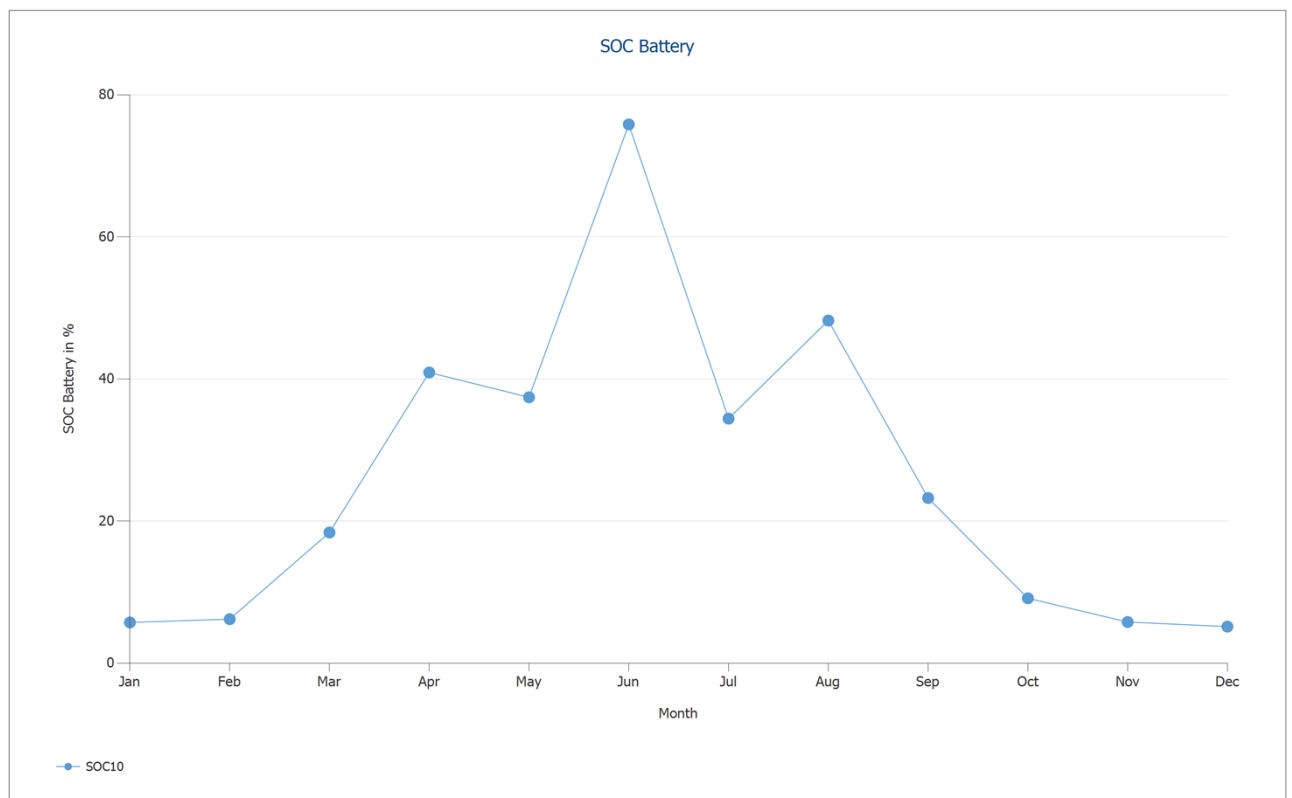


Figure: SOC Battery

Table: SOC Battery System

	Jan	Feb	Mar	Apr	May	Jun
	%	%	%	%	%	%
SOC10	5.7	6.2	18.4	40.9	37.4	75.8

	Jul	Aug	Sep	Oct	Nov	Dec
	%	%	%	%	%	%
SOC10	34.4	48.2	23.2	9.1	5.8	5.1

Results per Module Area

SportIrelandHockeyPavillion 01-Area 15-West

PV Generator Output	14.08 kWp
PV Generator Surface	63.94 m ²
Global Radiation at the Module	983.53 kWh/m ²
Global Radiation on Module without reflection	989.02 kWh/m ²
Performance Ratio (PR)	89.49 %
PV Generator Energy (AC grid)	12461.24 kWh/Year
Spec. Annual Yield	885.03 kWh/kWp

SportIrelandHockeyPavillion 01-Area 11-West

PV Generator Output	14.08 kWp
PV Generator Surface	63.94 m ²
Global Radiation at the Module	982.59 kWh/m ²
Global Radiation on Module without reflection	987.54 kWh/m ²
Performance Ratio (PR)	89.33 %
PV Generator Energy (AC grid)	12420.73 kWh/Year
Spec. Annual Yield	882.15 kWh/kWp

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

SportIrelandHockeyPavillion 01-Area 13-East

PV Generator Output	14.08 kWp
PV Generator Surface	63.94 m ²
Global Radiation at the Module	888.13 kWh/m ²
Global Radiation on Module without reflection	893.33 kWh/m ²
Performance Ratio (PR)	91.71 %
PV Generator Energy (AC grid)	11534.79 kWh/Year
Spec. Annual Yield	819.23 kWh/kWp

SportIrelandHockeyPavillion 01-Area 17-East

PV Generator Output	14.08 kWp
PV Generator Surface	63.94 m ²
Global Radiation at the Module	922.23 kWh/m ²
Global Radiation on Module without reflection	927.93 kWh/m ²
Performance Ratio (PR)	91.75 %
PV Generator Energy (AC grid)	11987.16 kWh/Year
Spec. Annual Yield	851.36 kWh/kWp

PV System Energy Balance

PV System Energy Balance

Global radiation - horizontal	983.40 kWh/m²	
Deviation from standard spectrum	-9.83 kWh/m ²	-1.00 %
Ground Reflection (Albedo)	5.32 kWh/m ²	0.55 %
Orientation and inclination of the module surface	-29.42 kWh/m ²	-3.01 %
Module-independent shading	0.00 kWh/m ²	0.00 %
Reflection on the Module Surface	-5.34 kWh/m ²	-0.56 %
Global Radiation at the Module	944.12 kWh/m²	
	944.12 kWh/m ²	
	x 255.758 m ²	
	= 241,465.54 kWh	
Global PV Radiation	241,465.54 kWh	
Soiling	0.00 kWh	0.00 %
STC Conversion (Rated Efficiency of Module 22.02 %)	-188,294.44 kWh	-77.98 %
Rated PV Energy	53,171.10 kWh	
Module-specific Partial Shading	-18.53 kWh	-0.03 %
Low-light performance	-42.07 kWh	-0.08 %
Deviation from the nominal module temperature	-62.55 kWh	-0.12 %
Diodes	-5.26 kWh	-0.01 %
Mismatch (Manufacturer Information)	-1,060.85 kWh	-2.00 %
Mismatch (Configuration/Shading)	-0.01 kWh	0.00 %
PV Energy (DC) without inverter clipping	51,981.82 kWh	
Failing to reach the DC start output	-6.20 kWh	-0.01 %
Clipping on account of the MPP Voltage Range	0.00 kWh	0.00 %
Clipping on account of the max. DC Current	0.00 kWh	0.00 %
Clipping on account of the max. DC Power	0.00 kWh	0.00 %
Clipping on account of the max. AC Power/cos phi	-241.10 kWh	-0.46 %
MPP Matching	-51.73 kWh	-0.10 %
PV energy (DC)	51,682.79 kWh	
Energy at the Inverter Input	51,682.79 kWh	
Charge DC storage	-10,237.08 kWh	-
Discharge DC storage	9,401.93 kWh	-
Input voltage deviates from rated voltage	-118.08 kWh	-0.23 %
DC/AC Conversion	-1,053.48 kWh	-2.08 %
Standby Consumption (Inverter)	-43.34 kWh	-0.09 %
Total Cable Losses	-1,497.03 kWh	-3.02 %
PV energy (AC) minus standby use	48,360.58 kWh	
PV Generator Energy (AC grid)	48,403.93 kWh	

Data Sheets

PV Module Data Sheet

PV Module: JAM54S31-440/LR (v1)

Manufacturer	JA Solar Holdings Co., Ltd.
Available	Yes

Electrical Data

Cell Type	Si monocrystalline
Half-cell module	Yes
Cell Count	108
Number of Bypass Diodes	3
Loss voltage per bypass diode	1 V
Integrated power optimizer	No
Only Transformer Inverters suitable	No

I/V Characteristics at STC

MPP Voltage	31.86 V
MPP Current	13.81 A
Open Circuit Voltage	38.45 V
Short-Circuit Current	14.58 A
Increase open circuit voltage before stabilisation	0 %
Nominal output	440 W
Fill Factor	78.48 %
Efficiency	22.02 %

I/V Part Load Characteristics

Values source	Manufacturer/user-created
Irradiance	200 W/m ²
Voltage in MPP at Part Load	31.503 V
Current in MPP at Part Load	2.786 A
Open Circuit Voltage (Part Load)	36.237 V
Short Circuit Current at Part Load	2.916 A

Additional Parameters

Temperature Coefficient of Voc	-113.1 mV/K
Temperature Coefficient of Isc	6.3 mA/K
Temperature Coefficient of Pmpp	-0.33 %/K
Incident Angle Modifier (IAM)	100 %
Maximum System Voltage	1500 V

Mechanical Data

Width	1134 mm
Height	1762 mm
Depth	30 mm
Frame Width	33 mm
Weight	20 kg

Inverter Data Sheet

Inverter: SUN2000-20K-MB0 (v1)

Manufacturer	Huawei Technologies
Available	Yes
Electrical data - DC	
DC nominal output	20.39 kW
Max. DC Power	30 kW
Nom. DC Voltage	600 V
Max. Input Voltage	1100 V
Max. Input Current	60 A
Max. short circuit current	60 A
Number of DC Inlets	4
Electrical data - AC	
AC Power Rating	20 kW
Max. AC Power	22 kVA
Nom. AC Voltage	230 V
Number of Phases	3
With Transformer	No
Electrical data - other	
Change in Efficiency when Input Voltage deviates from Rated Voltage	0.25 %/100V
Min. Feed-in Power	50 W
Standby Consumption	5.5 W
Night Consumption	5.5 W
MPP Tracker	
Output Range < 20% of Power Rating	99.9 %
Output Range > 20% of Power Rating	99.9 %
Count of MPP Trackers	2
MPP Tracker 1-2	
Max. Input Current	30 A
Max. short circuit current	30 A
Max. Input Power	21.6 kW
Min. MPP Voltage	200 V
Max. MPP Voltage	1000 V

Battery System Data Sheet

Battery System: SUN2000-20K-MB0 + LUNA2000-21-S1 (20.7 kWh) (v3)

Manufacturer	Huawei Technologies
Available	Yes
Battery Inverter	
Nominal output	10.5 kW
Maximum Charging Power	10.5 kW
Maximum Discharge Power	10.5 kW
Type of coupling	DC intermediate circuit coupling
Battery	
Manufacturer Battery	Huawei Technologies
Model	LUNA2000-7-E1 (v1)
Quantity	3 (3x1)
DC Battery System Voltage	76.8 V
Usable Battery Energy	20.9 kWh
Capacity at t=10h	280 Ah

Battery Data Sheet

Battery: LUNA2000-7-E1 (v1)

Manufacturer	Huawei Technologies
Available	Yes
Electrical Data	
Battery Type	Lithium iron phosphate
Cell voltage	3.2 V
No. of Cells in Series	8
Nom. Voltage	25.6 V
Number of Battery Strings	1
Internal Resistance	5 mΩ
Self-Discharge	1.8 %/Month
Service Life in Charge-discharge Cycles (DoD = 40 %)	13688
Mechanical Data	
Length	590 mm
Width	255 mm
Height	360 mm
Weight	68 kg

Plans and parts list

Circuit Diagram

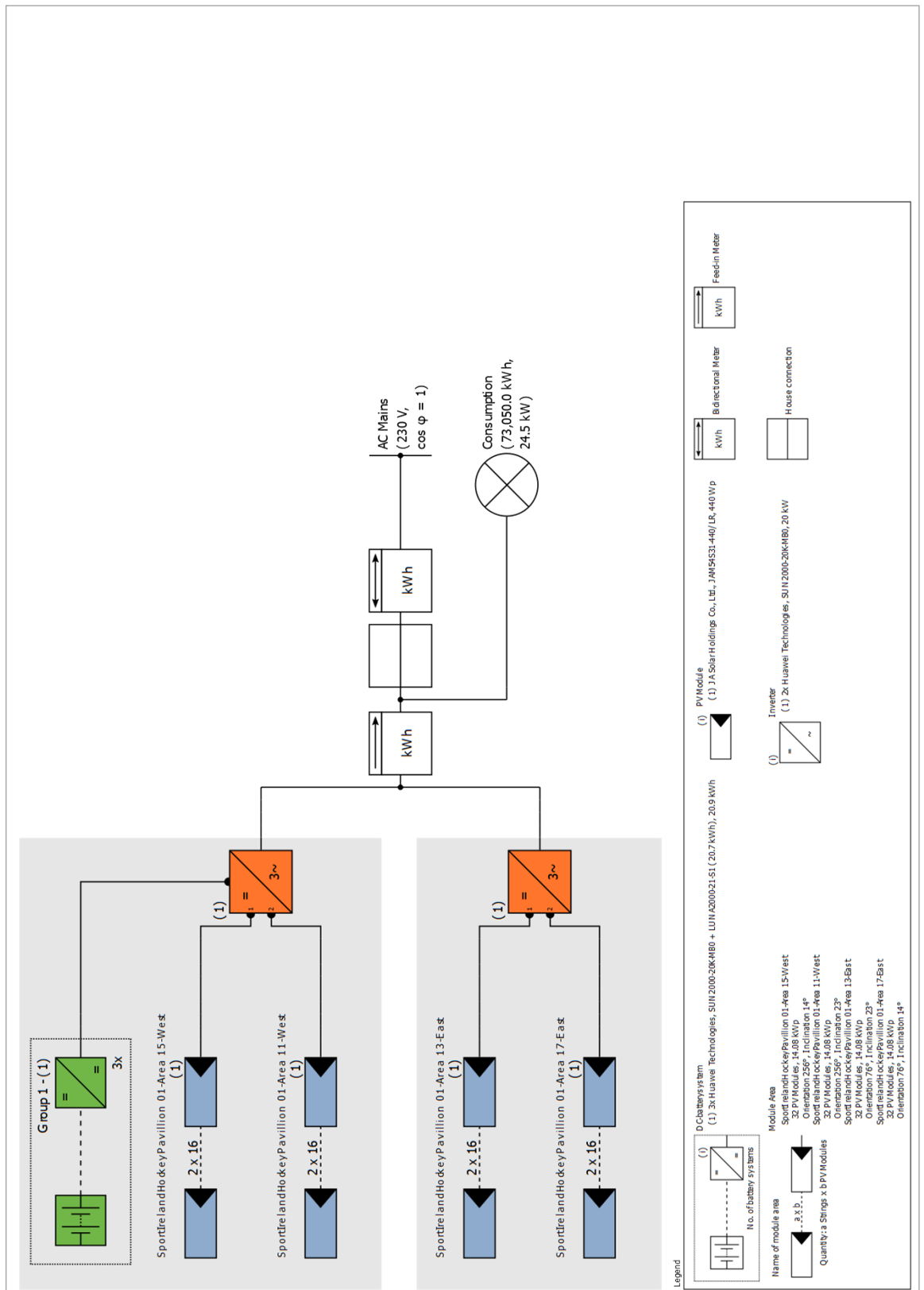


Figure: Circuit Diagram

Overview plan

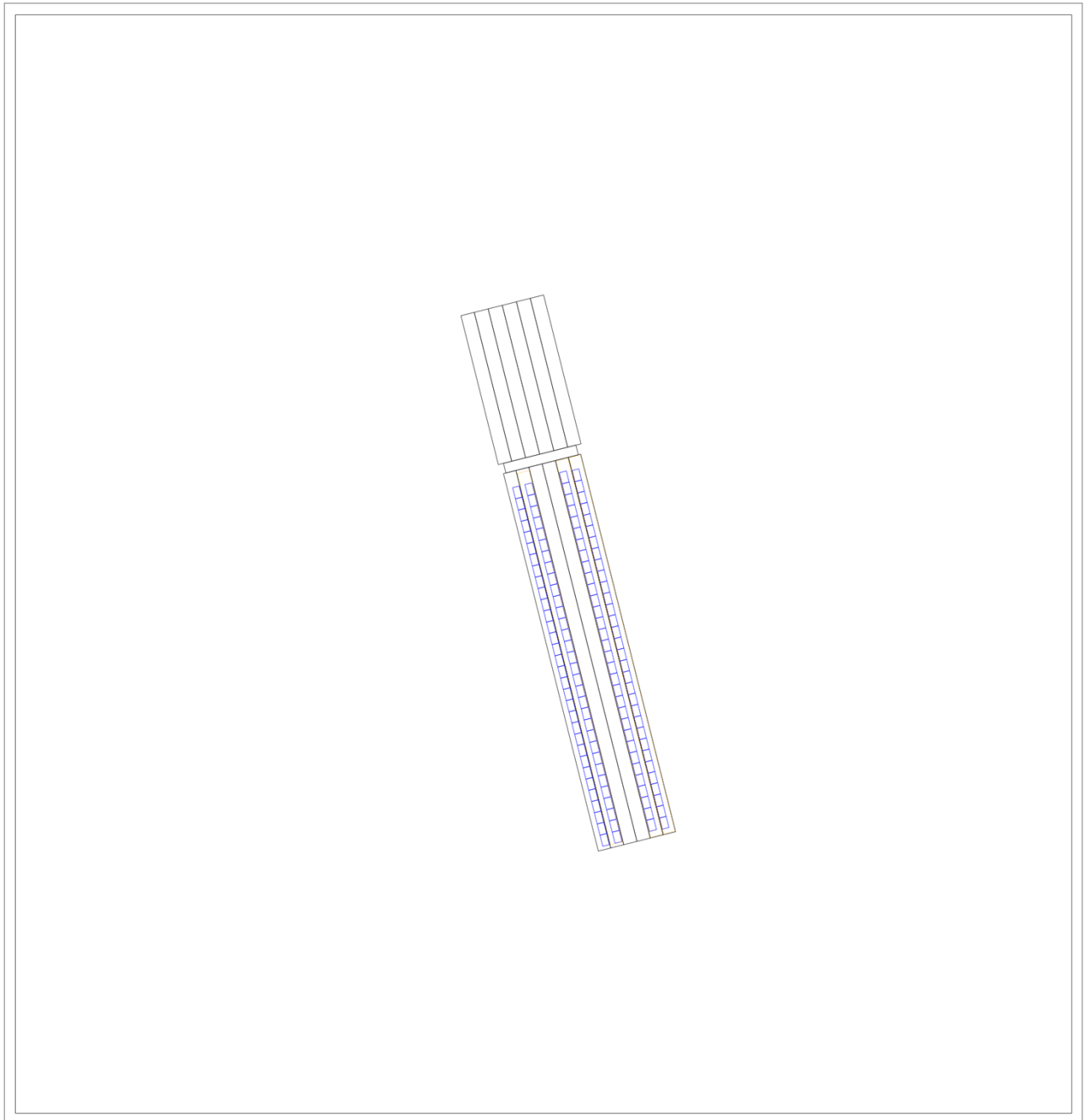


Figure: Overview plan

Dimensioning Plan

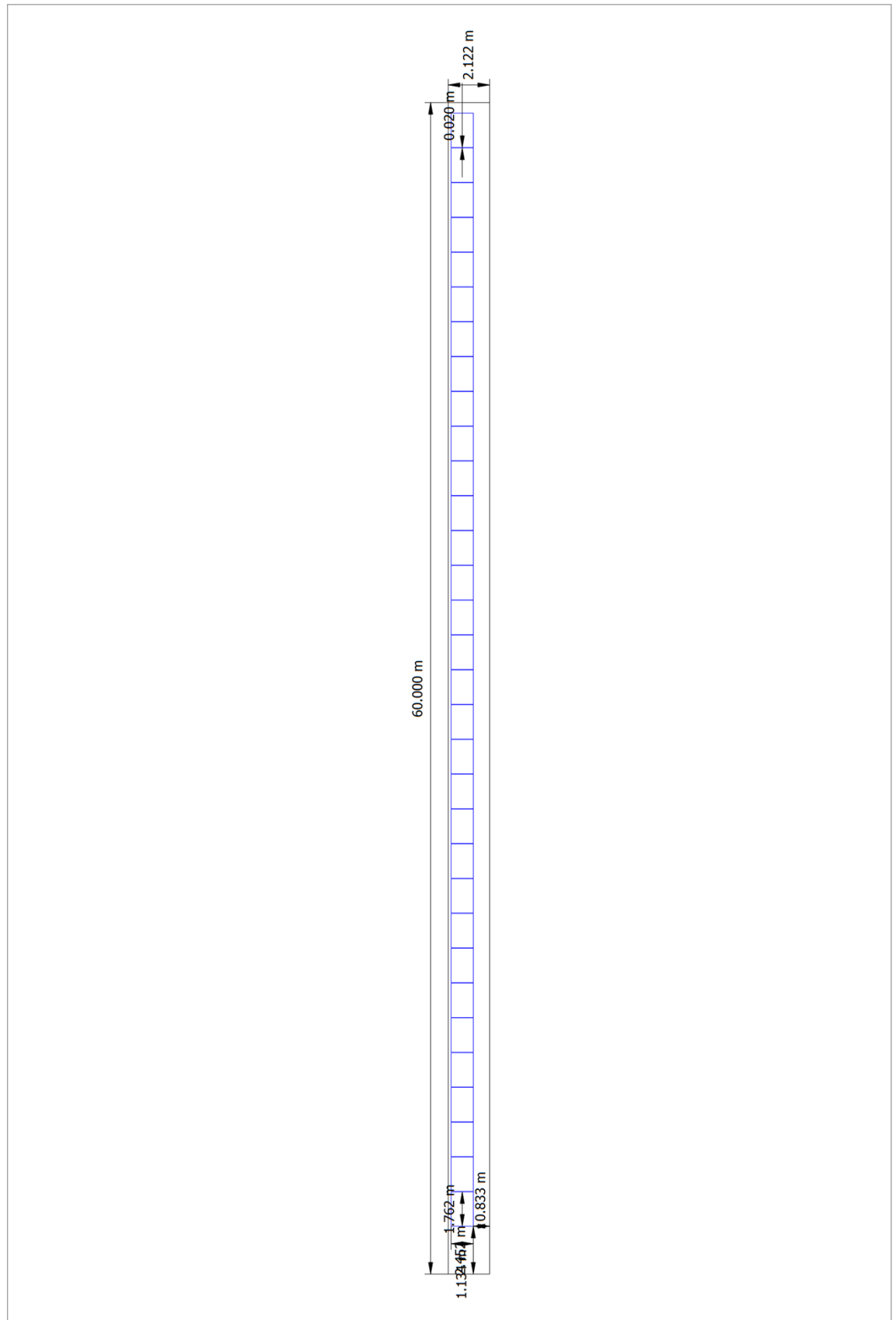


Figure: SportIrelandHockeyPavillion 01 - Area 15-West

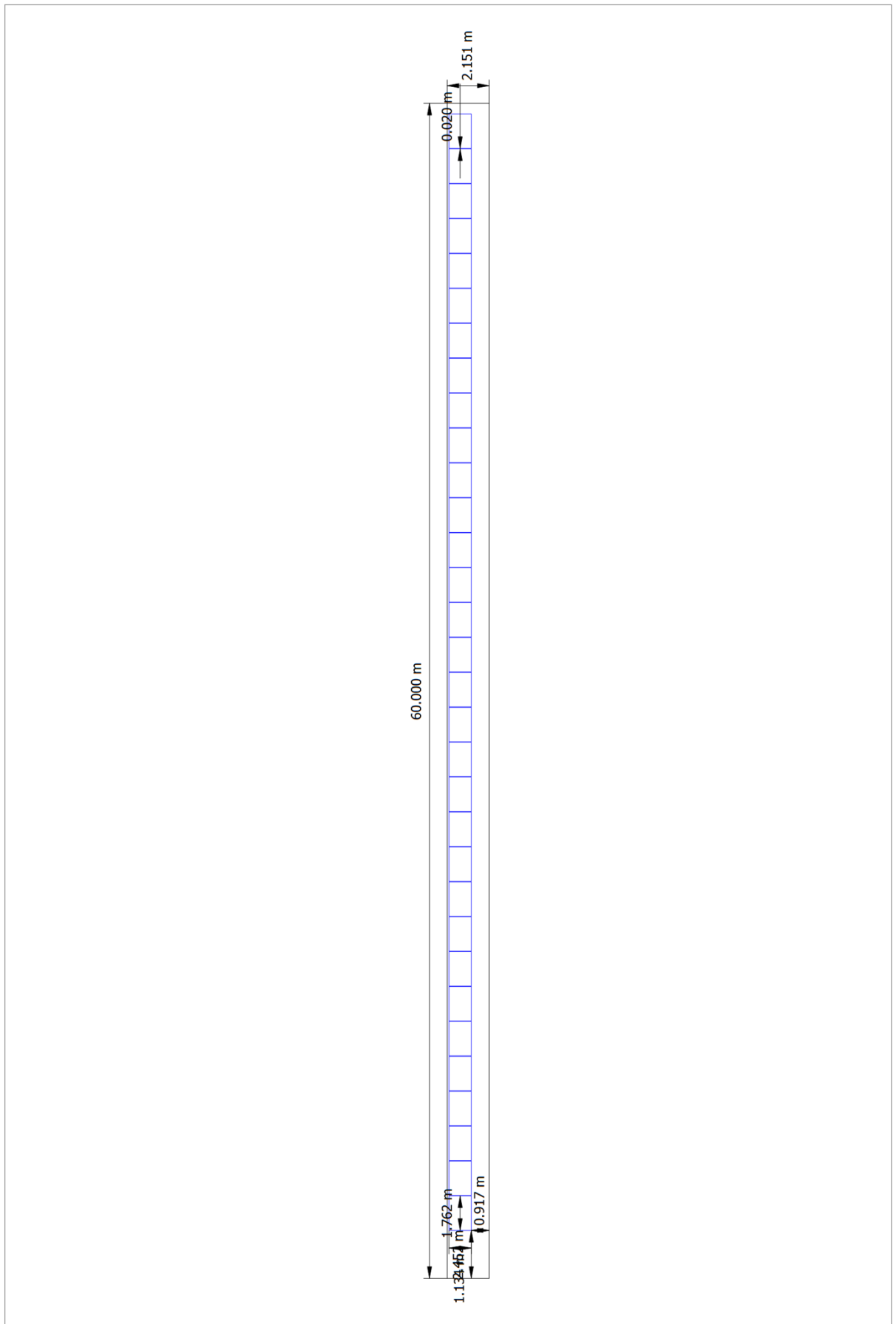


Figure: SportIrelandHockeyPavillion 01 - Area 11-West

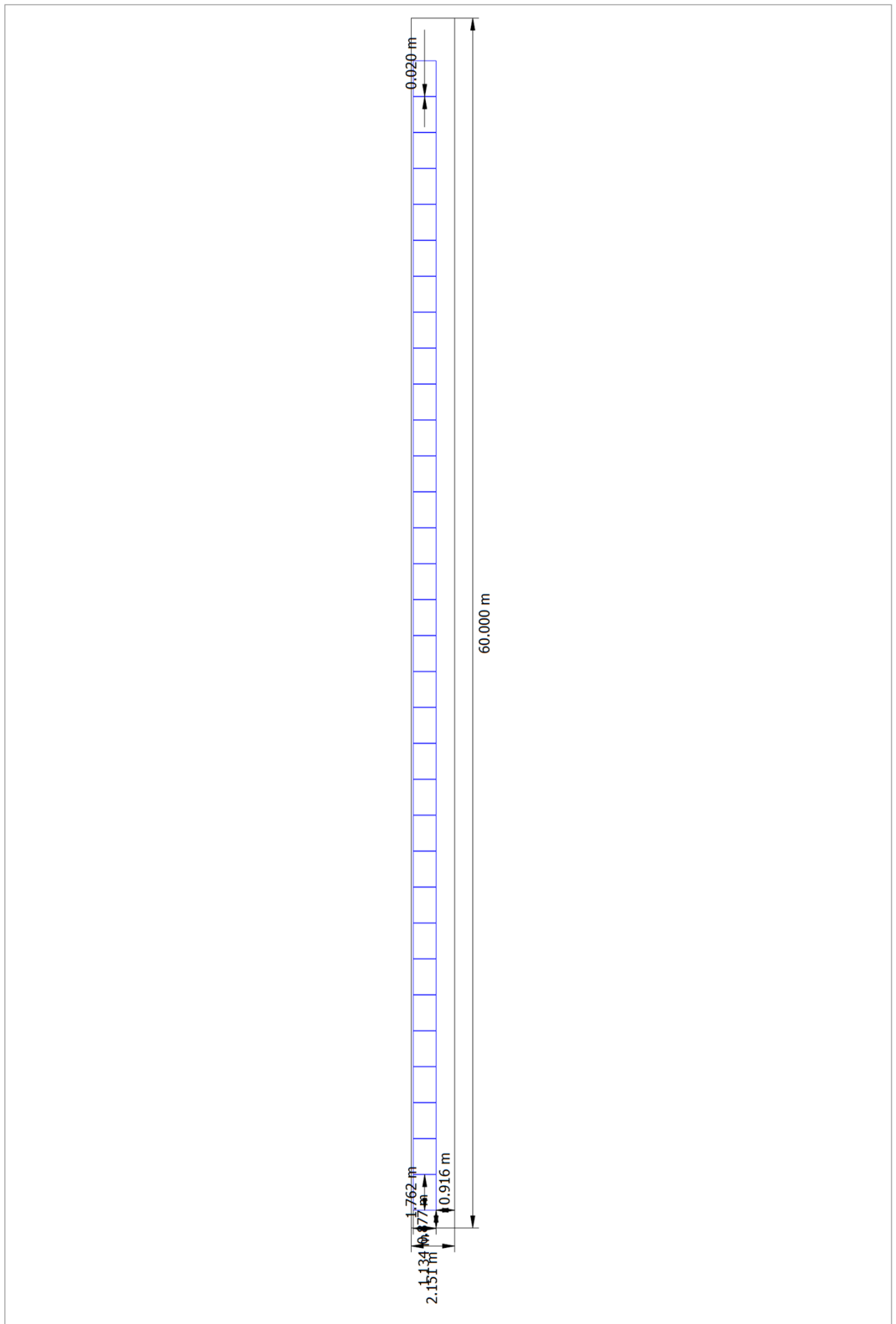


Figure: SportIrelandHockeyPavillion 01 - Area 13-East

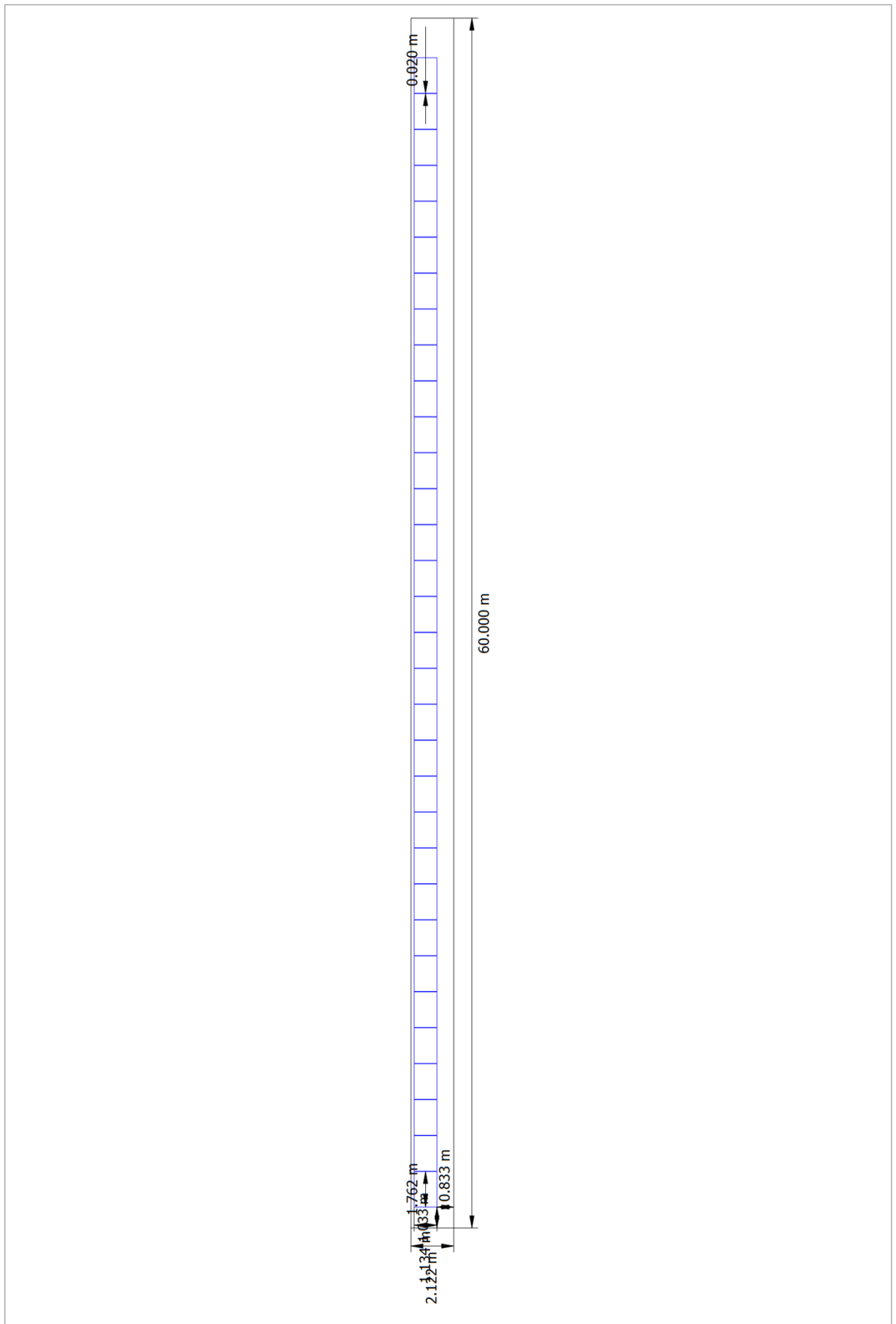


Figure: SportIrelandHockeyPavillion 01 - Area 17-East

String Plan

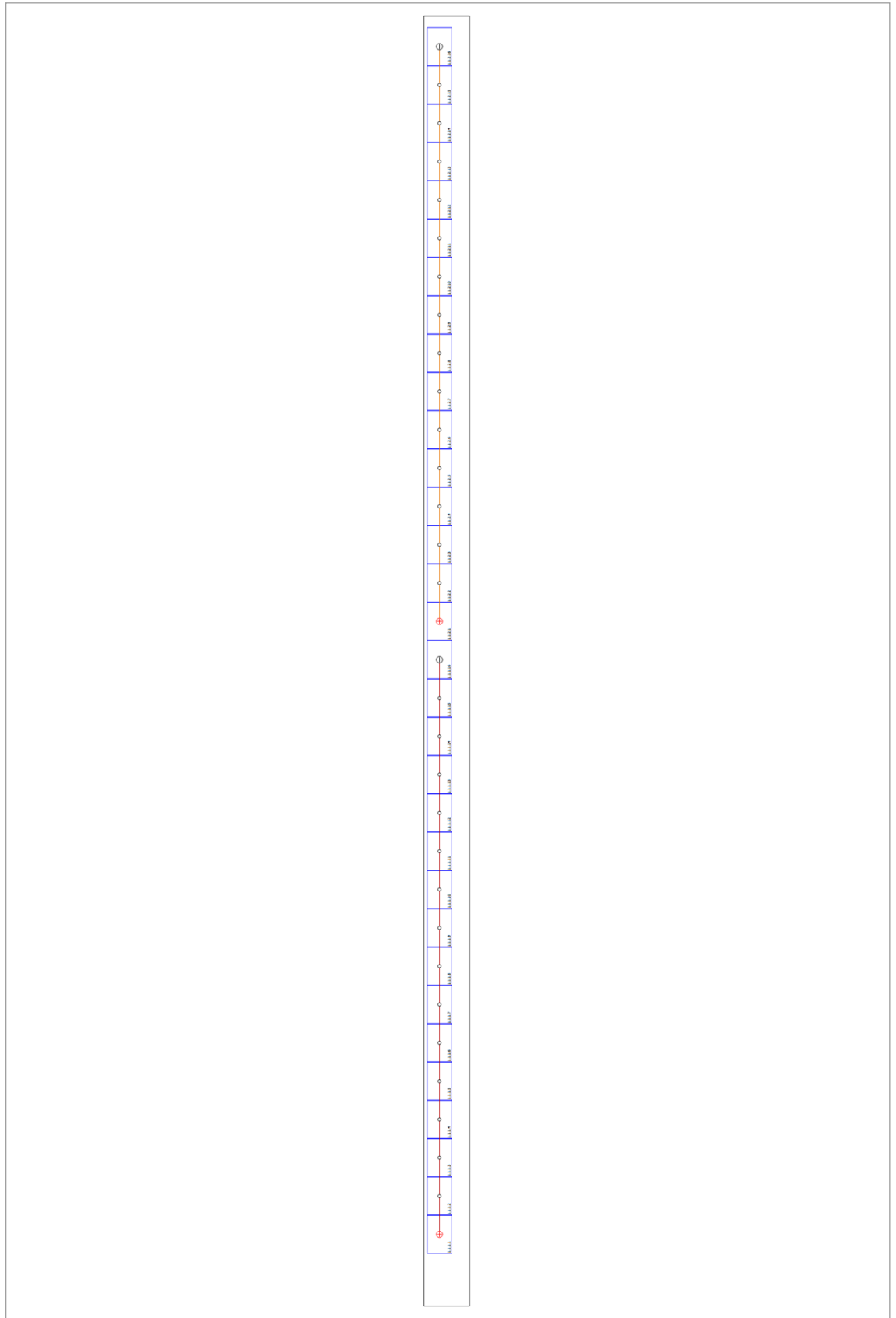


Figure: SportIrelandHockeyPavillion 01 - Area 15-West

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

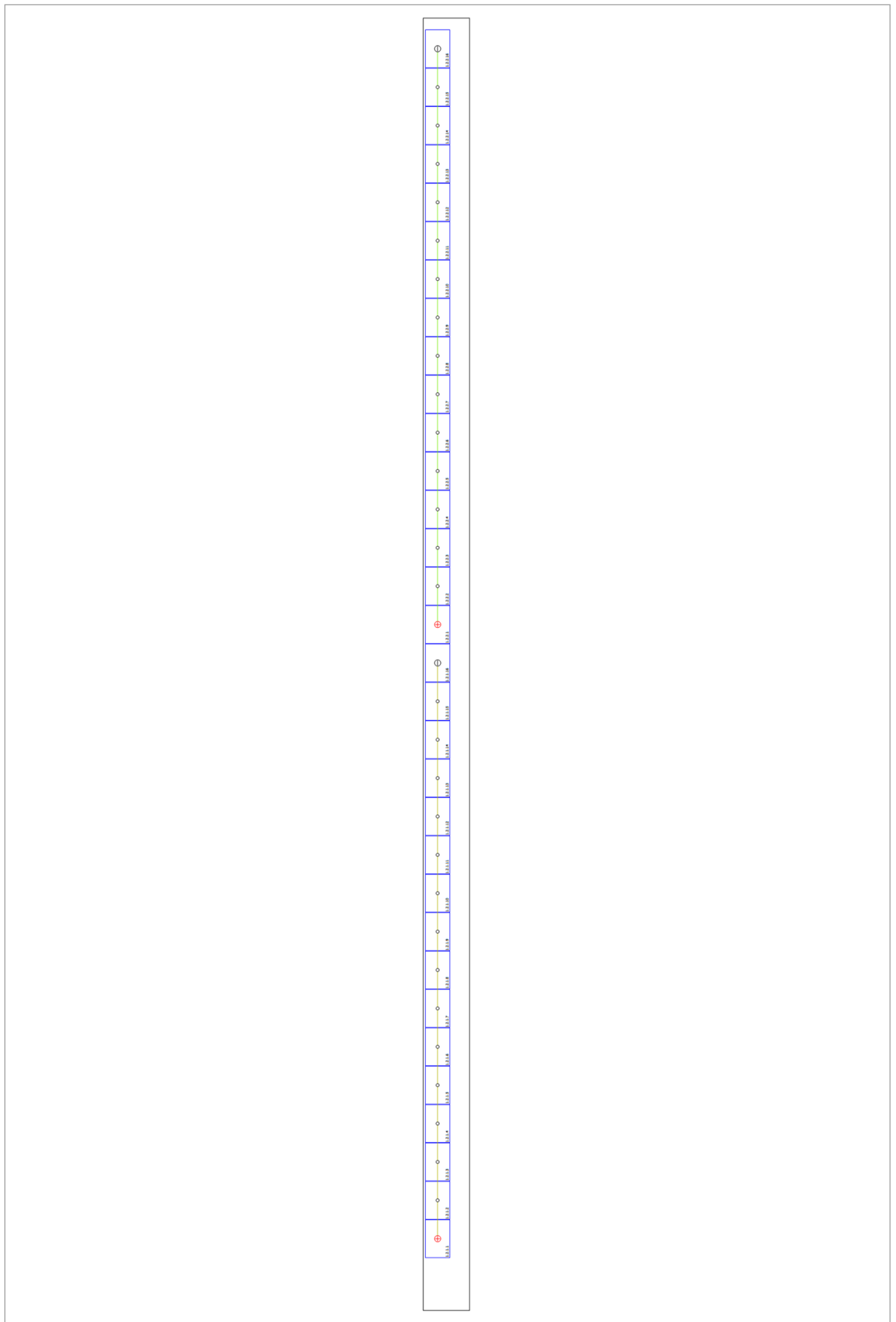


Figure: SportIrelandHockeyPavillion 01 - Area 11-West

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

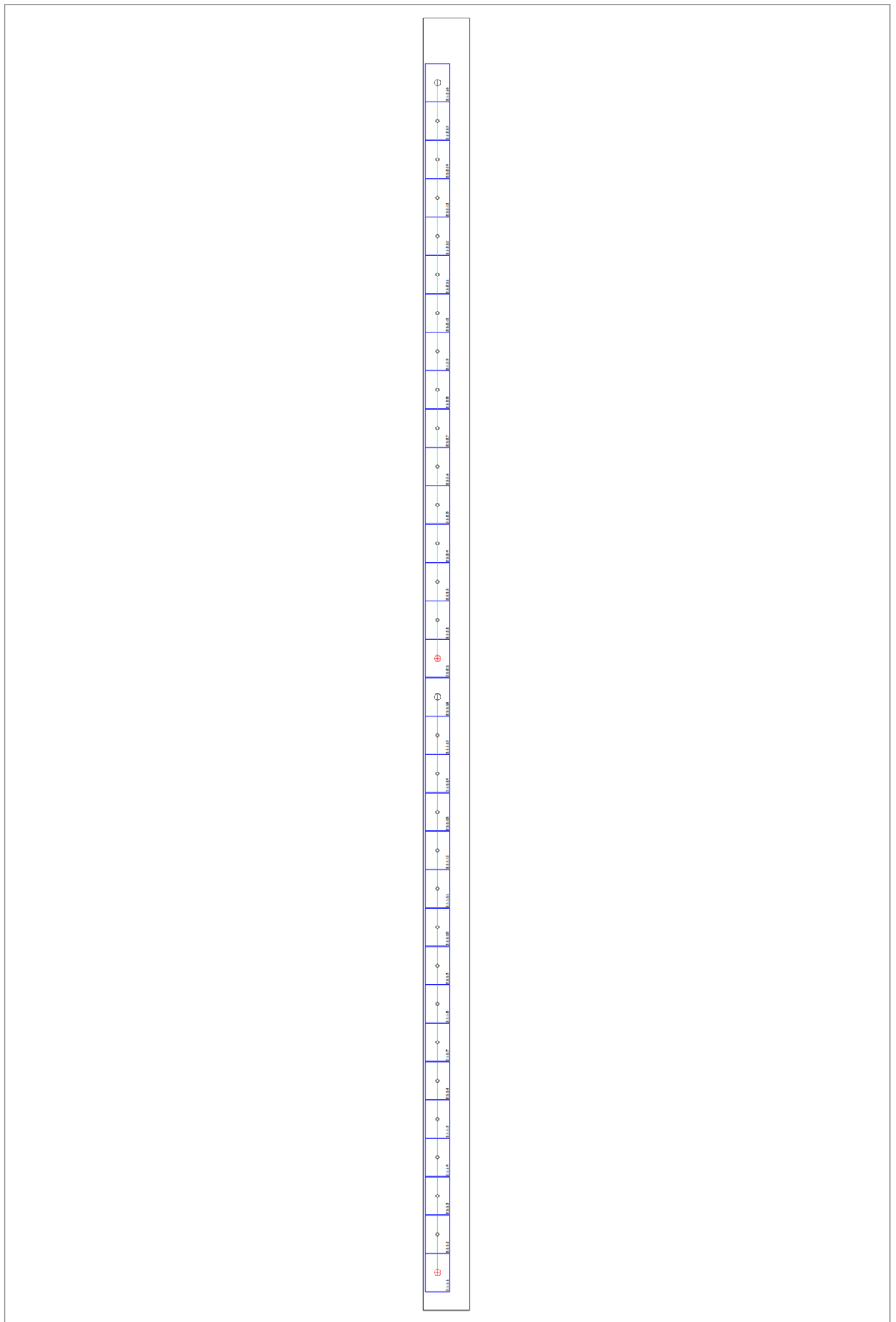


Figure: SportIrelandHockeyPavillion 01 - Area 13-East

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

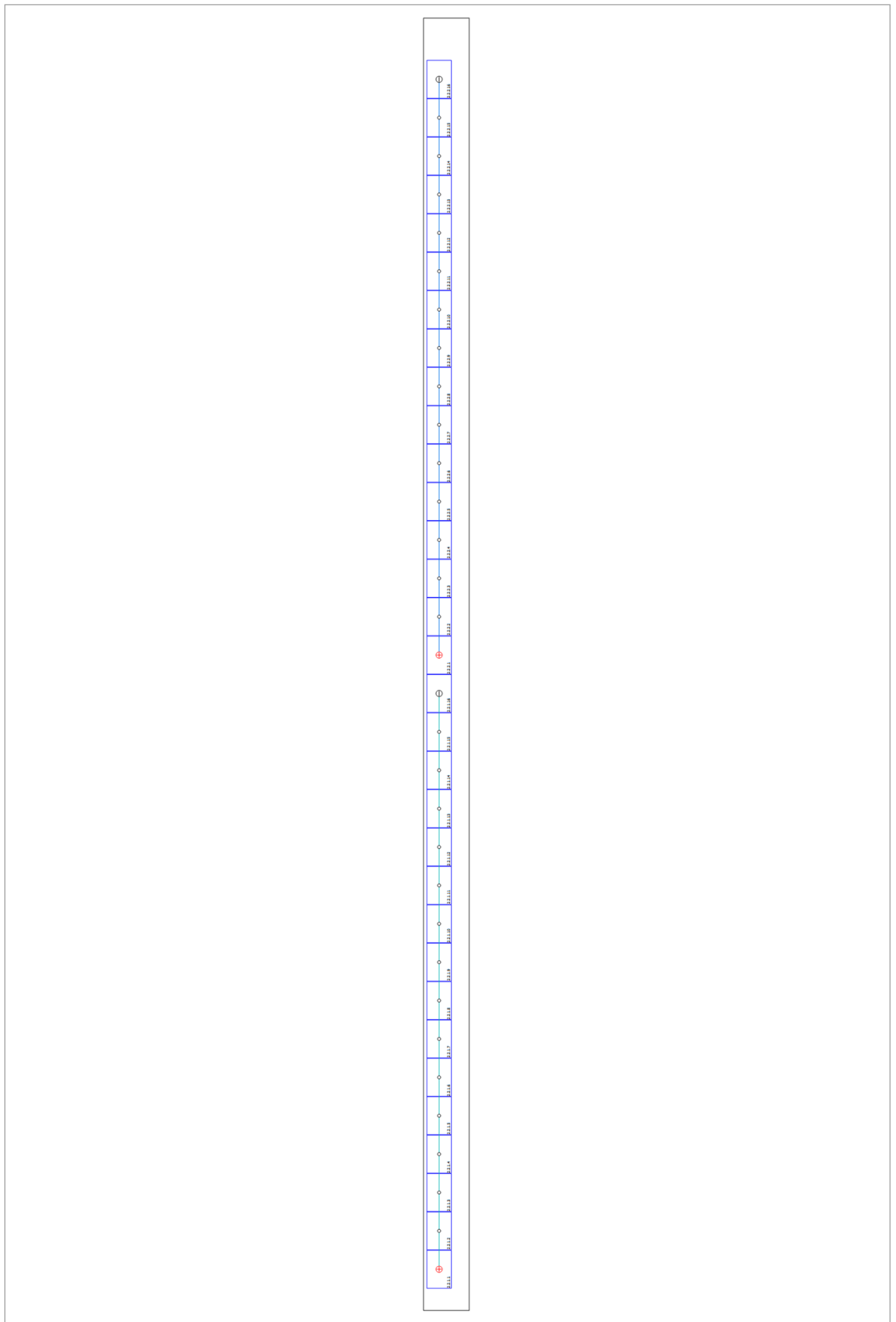


Figure: SportIrelandHockeyPavillion 01 - Area 17-East

Sport Ireland - Pavilion Building - Final

Offer Number: Pavilion Building

Client: Sport Ireland

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		JA Solar Holdings Co., Ltd.	JAM54S31-440/LR	128	Piece
2	Inverter		Huawei Technologies	SUN2000-20K-MB0	2	Piece
3	Battery System		Huawei Technologies	SUN2000-20K-MB0 + LUNA2000-21-S1 (20.7 kWh)	3	Piece
6	Components			Bidirectional Meter	1	Piece
7	Components			Circuit Breaker AC Isolator	1	Piece
8	Components			Energy flow sensor kWh	1	Piece
9	Components			Network and System Protection - Fireman Shunt	4	Piece
10	Components			Circuit Breaker DC Isolator	4	Piece