



A programme of the International Iron and Steel Institute

**3rd Living Steel
International Architectural Competition
for Sustainable Housing**

**Competition Brief – Part II Programme
Russia**

PROVISIONAL
10 March 2008





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3rd Living Steel International Competition for Sustainable Housing

COMPETITION BRIEF FOR RUSSIA

The competition brief is composed of two parts;

- Part I Regulations, and
- Part II Programme.

Part I Regulations has a publication date of 28 January 2008.

Part II Programme has a publication date of 12 May 2008.

The provisional Part II document has a release date of 10 March 2008. This document is subject to revision with the final document to be issued to the Competition Teams on 12 May 2008.

Both parts of the competition brief may be downloaded from the Living Steel website www.livingsteel.org on or after these dates.

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Part II

Programme

1.0 Introduction

The aim of the competition is to advance the use of steel in sustainable housing through the identification and application of best practices and innovative approaches. The intention is for the winning design to be built.

The following section sets out the detailed building requirements for the housing project in Cherepovets, Russian Federation.

2.0 Building Scope

The building site will eventually be the location of up to 1,500 homes. The competition asks for 3 to 5 housing styles based on a single construction technology. Adaptability of the building methodology based on a set of standard building components is an important consideration.

Table 1. Summary of housing competition indicators.

Indicator	Value
Building Type	Single Family Housing
Stories	1 or 2
Usable Floor Area	120 – 150 m ²
Housing Styles	3 – 5
Minimum Room Requirements	Living Room / Dining Room Kitchen Bathroom 2 bedrooms (more for larger families) Garage for 1 Automobile
Utilities Provided	Electricity / Natural Gas / Water
Typical Land Area Per House	700 – 1,200 m ²

2.1 Building Cost

The targeted construction cost per house is USD 120,000.

Included in this cost are labour, materials, bathroom fixtures and lighting.

Not included in this cost are land and fit out of the kitchen.

2.2 Building Energy Performance

Living Steel desires to find means for the housing designs to be highly energy efficient and to minimise climate change emissions through the life cycle of the

buildings. The constraint of this desire is the solutions must be affordable and achievable in the Russian market.

Competition Teams are referred to International Organisation for Standardization publication ISO 13790:2008 as a reference for the calculation of energy use for space heating and cooling.

It is suggested the energy consumption be less than 100 kWh/a per m².

2.3 Presentation to the Jury

As noted in Article 15.1 of the Competition Brief Part I, the selected Competition Teams will be required to present their schemes to the Jury. The presentations will take place 26-27 June 2008 in Helsinki, Finland.

Competition Teams are particularly advised to note the requirements of Articles 13 (Adjudication Criteria) and 15 (Competition Documents to be Submitted) when preparing their presentations. The presentations must address each of the adjudication criteria.

2.4 Master Planning

The homes under consideration in the competition are part of a larger development that will result in up to 1,500 homes. The housing designs will be integrated into a master plan for the development.

For the purpose of Competition Team submissions to be presented to the Jury, the issue of master planning should not be included.

During the competition event in Helsinki, Finland, the Competition Teams will be combined into four groups to participate in a charrette design workshop. During this two day workshop the issue of master planning the development in Cherepovets will be considered. The workshop will take place 28-29 June 2008 in Helsinki, Finland.

More information to prepare for the workshop will be provided to the Competition Teams prior to their arrival in Helsinki.

3.0 Location

The location of the building site is in the city of Cherepovets, Russian Federation. Cherepovets is the most populous city in the Vologda Region with a population of 314,000 people.

Cherepovets is located at latitude 59° 08' N and longitude 37° 55' E. It is 620 km north from Moscow and 475 km east of St Petersburg. Cherepovets covers an area of 125 km².



Figure 1. Location of Cherepovets in the Vologda Region of Russia.

The building site is on the south side of Cherepovets in an area of 180,000 m². The site is located on the shore of the Rybinsk reservoir of the Volga River and is surrounded by forest. The Rybinsk reservoir has a surface area of 4,580 km² with an average depth of 5.6 m and maximum depth of 28 m.



Figure 2. Location of the demonstration location with respect to Cherepovets and SeverStal.

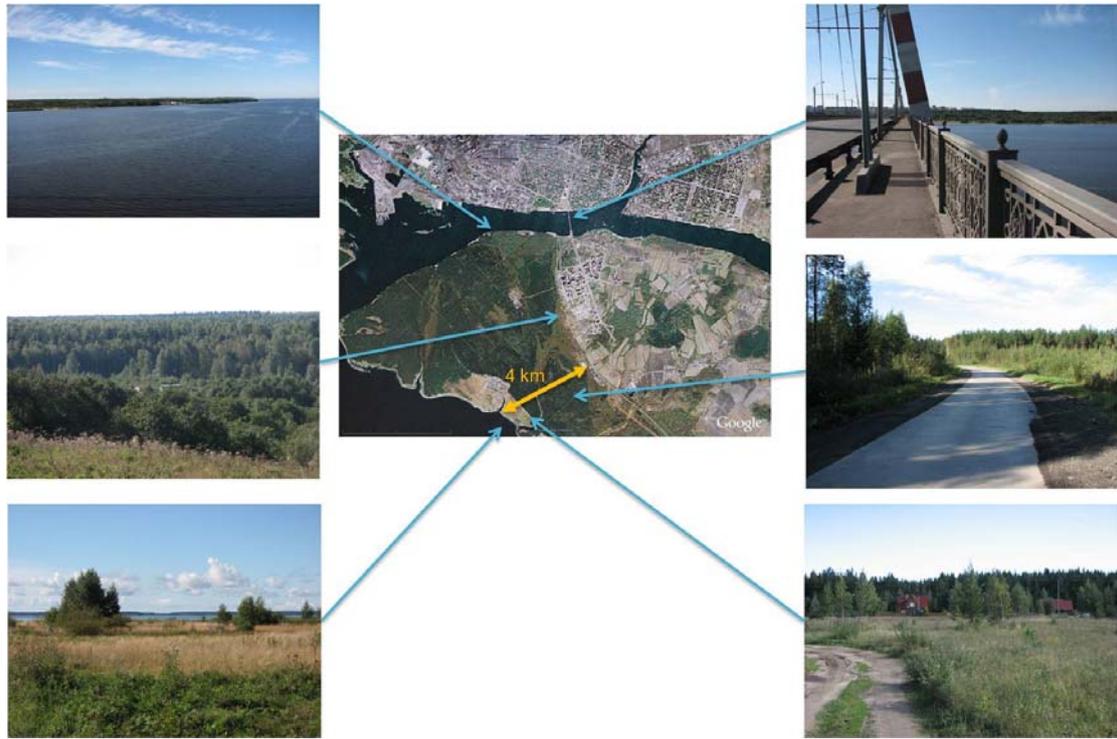


Figure 3. Images of the demonstration location area.



Figure 4. Images of Cherepovets



Figure 5. Images of Cherepovets.



Figure 6. Images of Cherepovets.



Figure 7. Images of Cherepovets



Figure 8. Images of Cherepovets.



Figure 9. Images of Cherepovets.



Figure 10. Images of Cherepovets.



Figure 11. Images of Cherepovets.

3.1 Site Topography

Precise site topography data may be provided to the Competition Teams as it becomes available. It may be assumed the slope of the building site is flat.

3.2 Site Videos

A [Google Earth video](#) showing the demonstration location in relation to Cherepovets can be viewed on the Living Steel website.

A short movie of [Cherepovets](#) and area can also be found on the Living Steel website.

4.0 Climate

The climate for Cherepovets is summarised in the tables below.

Table 2. Climatic indicators for Cherepovets.

Indicator	Value
Latitude	59° 08' N
Longitude	37° 55' E
Elevation	~120 m above sea level
Mean annual air temperature in July	17.1°C
Mean annual air temperature in January	-12.1°C
Absolute minimum air temperature	-49.0°C
Absolute maximum air temperature	34.0°C
Mean annual precipitation	648 mm

Table 3. Temperature data by month for Cherepovets.²

Month	Temperature (°C)				
	Average	Highest	Lowest	Average Low	Average High
January	-11	5	-48	-13	-8
February	-11	3	-38	-13	-6
March	-5	11	-35	-8	0
April	2	27	-21	-2	8
May	9	30	-12	4	16
June	14	31	-2	9	20
July	17	35	2	12	23
August	15	36	1	9	20
September	9	27	-6	5	14
October	2	22	-22	1	6
November	-3	11	-32	-6	-2
December	-8	7	-40	-11	-6

² Source: http://qwikcast.weatherbase.com/weather/weatherall_c.php3?s=31172&refer=

Table 4. Precipitation and humidity data by month for Cherepovets.³

Month	Average Precipitation (cm)	Average Relative Humidity (%)
January	4	85
February	4	83
March	5	80
April	3	74
May	5	68
June	5	68
July	10	75
August	7	79
September	5	83
October	6	86
November	4	88
December	6	87

4.2 Solar Data

Solar data for Cherepovets is available on the website

www.gaisma.com/en/location/cherepovets.html.

Data to be found on the site includes including hours of sunshine by month, a sun path diagram, along with measures of solar energy and wind speed.

5.0 Building User Profile

The typical user of the housing will be single families comprised of 3 to 4 people, typically two adults and children. One or two of the adults will be employees of SeverStal who work at SeverStal facilities in Cherepovets.

The typical monthly income of the families is USD 800 to USD 1,600. This is representative of a middle income group in Cherepovets.

The occupancy pattern of the housing during the day should consider the following situations:

- (a) where both adults work outside the home during the day and the children are in school, leaving the house empty from 09.00 to 15.00, and
- (b) one adult remains home during the day with one child. The 2nd adult works outside the home during the day with the remaining children in school during the day.

It can be considered that the family is at home during the early morning, evening and night hours.

³ Source: http://qwikcast.weatherbase.com/weather/weatherall_c.php3?s=31172&refer=

6.0 Developer

The developer of the demonstration building is SeverStal JSC. SeverStal is a member company of Living Steel, one of the world's major steel producers and the largest employer in Cherepovets.

The land where the demonstration building may be developed is owned by SeverStal.

7.0 Building Materials

The Competition Teams are encouraged to integrate steel into their housing designs. The steel products may include, but are not limited to:

- (a) steel roofing systems including trusses and covering,
- (b) steel cladding,
- (c) cold rolled steel framing, both structural and non-structural,
- (d) steel flooring (decking) systems,
- (e) steel foundations,
- (f) steel doors,
- (g) steel fencing,
- (h) steel rainwater goods, and
- (i) decorative steel finishing.

In addition to the use of steel the Competition Teams are encourage to use other local building materials wherever feasible.

In the designs, Competition Teams should consider the use of materials that are available, or might reasonably be expected to be available, in the Russian market.

8.0 Building Codes

The housing designs must meet local architectural codes, including the minimum requirements for room sizing. However, this requirement is a necessary step during commissioning of the winning building design and is not a requirement of the competition. The Competition Team awarded first place and a commission to build their design must meet this need.

For the purpose of the competition, the Eurocodes (a set of European Standards EN 1990 – EN 1999) may be used as the technical design reference. Refer to Section 9, Sources of Information, for links to more information on the Eurocodes.

9.0 Sources of Information

Below is a table of websites where the Competition Teams may find additional information about Living Steel, its members, and the region of Vologda.

Table 5. Website addresses to find additional information.

Organisation	Website
Living Steel	www.livingsteel.org
International Iron and Steel Institute	www.worldsteel.org
Vologda Oblast Government	www.vologda-oblast.ru
SeverStal	www.severstal.com
ArcelorMittal	www.arcelormittal.com www.constructalia.com
Baosteel	www.baosteel.com
BlueScope Steel	www.bluescopesteel.com
Celsa Group	www.gcelsa.com
Corus	www.corusgroup.com www.corusconstruction.com
Erdemir	www.erdemir.com
IMIDRO	www.imidro.org
Posco	www.posco.co.kr
Ruukki	www.ruukki.com
Tata Steel	www.tatasteel.org
Solar Data	www.gaisma.com/en/location/cherepovets.html
Eurocodes	eurocodes.jrc.ec.europa.eu www.access-steel.com
Cherepovets Movies	www.livingsteel.org/extremehousing/cherepovets-russia http://www.livingsteel.org/extremehousing/take-a-virtual-visit-to-cherepovets

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