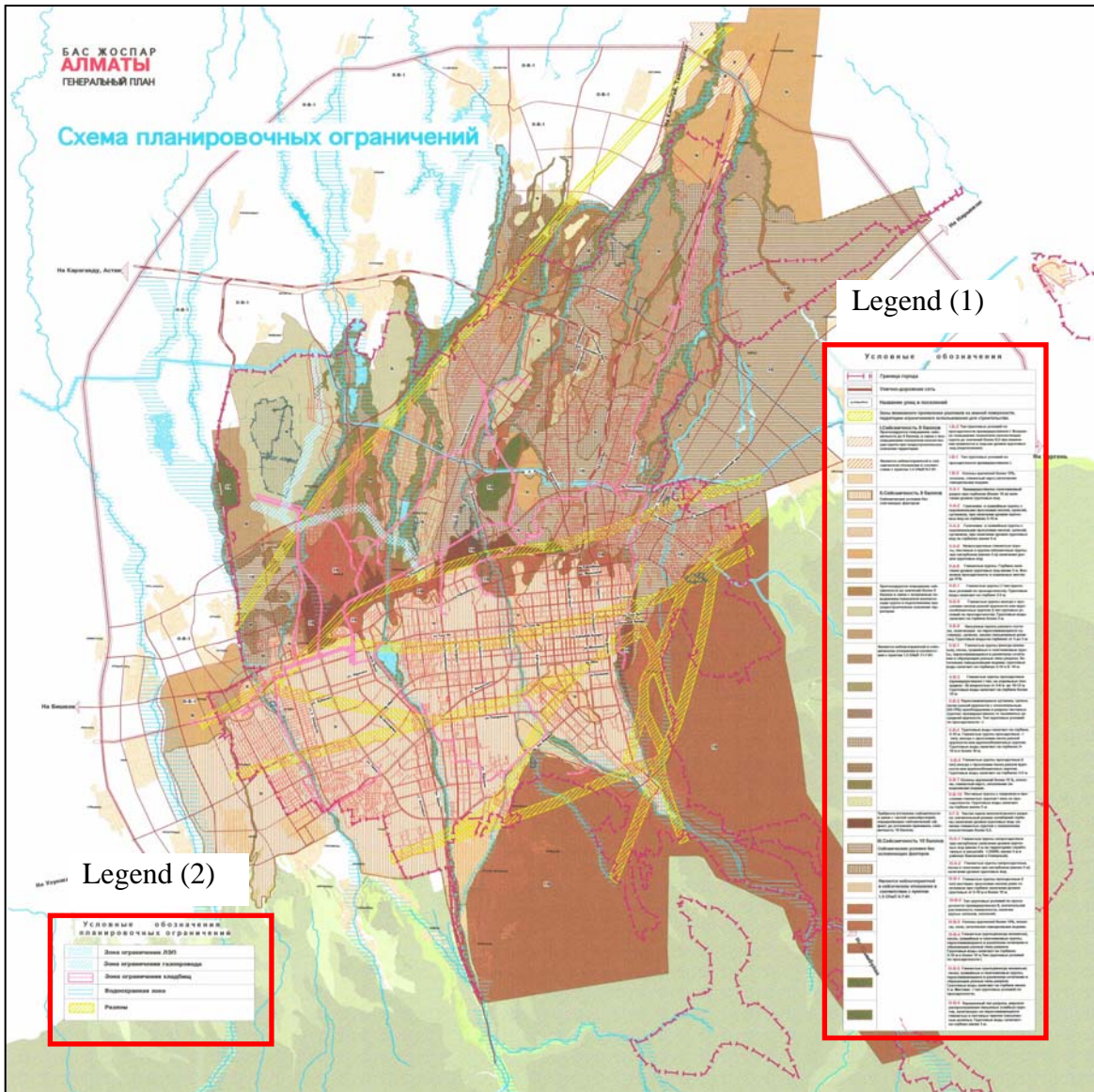


APPENDIX 9 ZONING CODE OF ALMATY CITY, REPUBLIC OF KAZAKHSTAN

Building Code (specially seismic code), Development Permission Criteria belong to this group. Figure A9.1.1 is zoning code (Urban Planning) of Almaty City (Republic of Kazakhstan). This zoning code informs the location of active fault and soft ground area. If land owner constructs new building on soft ground area, he must attention the regulation of earthquake-resistant strength. Construction work is limited on active fault.the point of good practices is connection of zoning code and geologic map. It is effective for strong city to earthquake.



Source: JICA Project Team

Figure A9.1.1 Building Control of Almaty City

Legend (1)

The City Boundary	
Street and Road Network	
Names of streets and settlements	
Zones of possible faults on the ground surface and the construction restricted area	
I. Seismicity – 8 points (Earthquake Intensity 8) Predicted increase of seismicity to 9 points due to possible increase of the soil consistency index during town-planning development of the area.	I-B-2 Subsidence soil conditions –Type 1 predominantly. Possible increase of the soil consistency index to the value over 0,5 at moisture changes, and rise of the ground water level (underflooding)
Unfavorable in seismic respect according to Item 1.5 of Building Regulations (SNiP) 11-7-81	I-B-1 Subsidence soil conditions –Type 1 predominantly I-B-3 Slope gradient – over 15%, landslide, clay karst, flood
II. Seismicity – 9 points (Earthquake Intensity 9) Seismic conditions without any external agent	II-A-1 Predominantly pebbel section; deep (over 10 m) ground water level. II-A-2 Pebble and gravel interlaid with sand, sandy loam, loamy soil; ground water level – 5-10 m II-A-3 Pebble and gravel interlaid with sand, sandy loam, loamy soil; ground water level – below 5m II-A-6 Non-subsiding clay soil, sandy and coarse-grained rock at shallow (below 5 m) ground water level II-A-8 Loamy soil. The ground water level below 5 m. Possible subsidence to UGV in some places
Predicted increase of seismicity to over 9 points due to possible increase of the soil consistency index and underflood during town-planning development of the area.	II-B-1 Loamy soil (Type 1 subsidence soil conditions). Ground water level – 2-5 m II-B-5 Loamy soil sometimes interlaid with different coarse sand or coarse-grained rock(Type 1 subsidence soil conditions). Ground water level over 3 m. II-B-6 Ground water level – 3-5 m. Fill-up ground of different constitution occurring on interlaid sandy loam, clay loam, sand (filled-up valleys).Ground water level – 3-5 m
It is unfavorable in seismic respect according to Item 1.5 of Building Regulations (SNiP) 11-7-81	II-B-1 Loamy soil (sometimes silty), sand, gravel and pebble interlaid in various proportion and forming different types of sections. Underflood, the ground water level – 5-10m and over 10m. II-B-2 Loamy subsiding soil (Type I predominantly and Type II in some places) between 5-6 m and 10-12 m deep. Ground water level – over 10m. II-B-3 Loamy soil, clay loam and different coarse sand with relative (50-70%) sandy soil prevailing in the section: mainly from sandy silt to medium sand. (Type 1 subsidence soil conditions). II-B-4 Loamy subsiding soil (Type I), sometimes interlaid with different coarse sand or coarse-grained rock Ground water level – 5-10 m and over 10m. II-B-5 Loamy subsiding soil (Type I), sometimes interlaid with different coarse sand or coarse-grained rock. Ground water level – 3-50 m. II-B-7 Slope gradient over 15%, landslide, clay karst, flooding II-B-10 Sandy soil with loamy soil (Type I) blanket and parting; Ground water level – below 5 m.
Updating of seismicity is required due to frequent change of conditions determining seismic effect; before updating seismicity of 10 points shall be applied.(Earthquake Intensity 10)	II-G-3 Frequent change of lithologic section; the ground water level varies greatly; presence of loamy soil with consistency index over 0,5.
III. Seismicity 10 points Seismic conditions without any external agent	III-A-1 Loamy non-subsiding soil at shallow ground water level ((below 5 m on the area surveyed at a scale of 1:25000; below 3m in the area of the BAK and the Northern). III-A-2 Loamy non-subsiding soil, sand and pebble at shallow ground water level ((below 5 m)
Unfavorable in seismic respect according to Item 1.5 of Building Regulations (SNiP) 11-7-81	III-B-1 Loamy subsiding soil (TypeI), interlaid with sand and rarely with pebbles; ground water level: 5-10m and over 10m. III-B-2 Soil subsidence conditions: predominantly of Type II; dissected relief; presence of steep slopes and mudslide. III-B-3 Slope gradient – over 15%, landslide, clay karst, flood III-B-4 Loamy soil (sometimes silty), sand, gravel and pebble interlaid in various proportion and forming different types of sections. Ground water level: 5-10 and over 10m. Subsidence soil

	<p>conditions of Type 1</p> <p>III-B-5 Loamy soil (sometimes silty), sand, gravel and pebble interlaid in various proportion and forming different types of sections. Ground water level: below 5m. In some places subsidence soil conditions of Type 1.</p> <p>III-B-6 Variable type of section, wide-spread of filled-up (soft) soil occurring in interlaid loamy and sandy soil (filled-up valleys). Ground water level: below 3m.</p>
--	---

Source:JICA Project Team

Legend (2)

Legend for Conservation Area

	The Conservation Area of Power Transmission Lines
	The Conservation Area of Gas Pipeline
	The Conservation Area of Cemeteries
	The Water Conservation Zone
	The Fault area

Source:JICA Project Team