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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Standard for urban utility tunnel engineering

城市综合管廊工程技术标准

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1 General provisions

1.0.1 The document states that it was drawn up in order to make intensive use of urban construction land, to raise the safety and the level of construction of urban engineering pipelines, to arrange in a coordinated way the laying of urban engineering pipelines inside utility tunnels, and to make the construction of urban utility tunnel works safe and suitable, economically reasonable, technically advanced and convenient for construction and maintenance.

1.0.2 It applies to the planning, the design, the construction and acceptance, and the maintenance management of newly built, extended and reconstructed urban utility tunnel works.

1.0.3 Utility tunnel construction is to follow the principles quoted in the text as planning first, moderately ahead of demand, adaptation to local conditions and overall coordination, and is to bring out the combined benefits of the utility tunnel.

1.0.4 Besides this document, the planning, design, construction and acceptance and maintenance management of utility tunnel works are to comply with the relevant current national standards.

2.1 Terms

2.1.1 utility tunnel - a structure built underground in a city, together with its ancillary facilities, to accommodate two or more kinds of urban engineering pipeline, whose internal space allows people to pass through. Three types are distinguished: trunk utility tunnel, branch utility tunnel and small utility tunnel.

2.1.2 trunk utility tunnel - a utility tunnel that mainly accommodates the trunk engineering pipelines of the city and that generally does not serve the users along its route directly.

2.1.3 branch utility tunnel - a utility tunnel that accommodates urban distribution engineering pipelines and serves users directly.

2.1.4 small utility tunnel - a utility tunnel that accommodates small-scale pipe networks or terminal distribution engineering pipelines and serves users directly.

2.1.5 urban engineering pipeline - municipal public pipelines inside the city built to meet living and production needs: water supply, stormwater, sewage, reclaimed water, natural gas, heat, electric power, communication and the like. Industrial pipelines are excluded.

2.1.6 communication cable - the collective name for the conductors that carry information data as electrical or optical signals, including optical communication cables, communication cables and the signal transmission cables of intelligent extra-low-voltage systems.

2.1.7 cast-in-site utility tunnel - a utility tunnel cast integrally in concrete on site.

2.1.8 precast utility tunnel - a utility tunnel cast and formed segment by segment in a factory and assembled on site into one whole.

2.1.9 junction for pipe or cable - the place where the pipelines inside the utility tunnel meet the directly buried pipelines outside it.

2.1.10 sump pit - a structure used to collect water leaking into the utility tunnel or water emptied from the pipes.

2.1.11 safety mark - a nameplate or colour marking set up for the classified management of the pipelines inside the utility tunnel, for safety guidance and for warning.

2.1.12 compartment - an enclosed space for laying pipelines, separated by the structure itself or by fire walls.

2.2 Symbols

2.2.1 Material properties: one symbol is listed, for the design value of the tensile strength of

prestressing tendons or bolts.

2.2.2 Actions and action effects: design value of bending moment; design value and characteristic value of the bending moment at the transverse joint of a precast utility tunnel segment; design value of the bending moment in the cast-in-place part of a precast segment; design value of axial force; design value of the axial force at the transverse joint of a precast segment; design value of the axial force in the cast-in-place part of a precast segment.

2.2.3 Geometrical parameters: sectional area of the gasket groove; sectional area of the gasket; sectional area of the prestressing tendon or bolt; section depth; depth of the concrete compression zone; relative rotation angle of the joint of a precast utility tunnel.

2.2.4 A further group of symbols for calculation coefficients and other quantities is announced at the foot of the page; its entries fall on a page that is not among the extracted images.

3 Basic requirements

3.0.1 Urban engineering pipelines for water supply, stormwater, sewage, reclaimed water, natural gas, heat, electric power and communication may be placed in a utility tunnel.

3.0.2 The clause is marked in the printed text as deleted, and is replaced by 3.0.2A: the construction of utility tunnel works is to conform to the special plan for utility tunnel works.

3.0.3 Utility tunnel works are to be planned and built in the important sections of the city and in the areas dense with pipelines, in combination with new district construction, old city renewal and new, extended or reconstructed roads.

3.0.4 Pipelines under the trunk roads of new urban districts should be placed in a utility tunnel, and the utility tunnel is to be built at the same time as the trunk road. In the old areas of a city, utility tunnel construction should be carried out together with the development of underground space, old city renewal, road reconstruction and the reconstruction of the main underground pipelines.

3.0.5 The planning and construction of utility tunnel works are to be connected and coordinated with underground space, environmental landscape and other related urban infrastructure.

3.0.6 The clause is marked as deleted, and is replaced by 3.0.6A: the construction of utility tunnel works is to comply with the relevant provisions of the current mandatory national engineering construction specification GB 55028 on special facilities projects.

3.0.7 The clause is marked as deleted, and is replaced by 3.0.7A, which requires that trunk and branch utility tunnels be built together with the fire protection, power supply, lighting, monitoring and alarm, ventilation, drainage and marking ancillary systems, and that small