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3

QUESTION 70

TRANSACTIONS

COMPTES RENDUS

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NOTE

Units of Measurement

As for the previous Congresses and though some authors do not fully agree, we attempt to follow the recommendations of the International System of Units (SI).

For example, hm^3 and km^3 were preferred to 10^6 and 10^9 m^3 , or million and billion cu.m. See Bulletin 34 "ICOLD Guide for the International System of Units (SI)", page 13.

The decimal sign may be the full stop (Anglo-Saxon usage) or the comma (European usage); but as a safeguard against confusion, full stop (period) and comma are used as decimal sign only.

Where the number of digits before or after the decimal sign exceeds three, the digit should be divided into groups of three by half space.

We meet not enough co-operation from some authors writing in English who go on keeping the comma to separate the groups of three digits instead of using half space. It was not possible to make the appropriate corrections in all the tables provided by the authors and even in the text. Sorry for the inconvenience.

AVERTISSEMENT

Unités de Mesure

Comme pour les Congrès précédents et bien que certains auteurs manifestent des réticences à ce sujet, on s'est efforcé de suivre les recommandations du Système International d'Unités (SI).

Par exemple, on a utilisé plus volontiers hm^3 et km^3 au lieu de 10^6 m^3 et 10^9 m^3 ou million et milliard de mètres cubes. Voir Bulletin 34 « Guide CIGB du Système International d'Unités (SI) », page 13.

De même, on a retenu le point (usage anglo-saxon) et la virgule (usage européen) comme signe décimal, mais pour éviter toute confusion, la virgule et le point ne sont utilisés que comme signe décimal.

Aussi, quand le nombre de chiffres avant ou après la virgule est supérieur à 3, les chiffres sont groupés par 3, chaque groupe étant séparé par un court espace.

A ce sujet nous rencontrons encore des difficultés de la part de quelques auteurs de langue anglaise qui continuent à utiliser la virgule au lieu d'un court espace pour séparer les groupes de trois chiffres. Nous n'avons pas pu apporter les corrections nécessaires dans tous les tableaux fournis par les auteurs et même dans le texte. On voudra bien nous en excuser.

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PAPERS ON Q 70

RAPPORTS SUR LA Q 70

QUESTION

70

**Staged construction, raising
or modification of dams**

Subject

- a)* Economic aspects of dams originally planned to be constructed in stages or that are raised later.
- b)* Design, construction, behaviour during operation of dams either constructed in stages or raised.
- c)* Foundation problems.
- d)* Specific problems of interface between the old and new sections.
- e)* Modification of appurtenant works and control of floods during construction.

**Construction par étapes, surélévation
ou modification de barrages**

Objet

- a)* Aspects économiques: construction par étapes prévue à l'avance; surélévation décidée après construction.
- b)* Conception, étude, exécution, comportement dans le temps, des barrages construits par étapes ou surélevés.
- c)* Problèmes posés par les fondations.
- d)* Problèmes spécifiques de raccordement entre les anciens et nouveaux ouvrages.
- e)* Modification des ouvrages annexes et maîtrise des crues pendant les travaux.

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Dix-huitième Congrès
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MODIFICATION OF DEFORMED JIRKOV DAM (*)

Jaromír PAŘÍZEK

CZECH REPUBLIC

The dam, 50 m high, was built in 1961-1965 as the most economical type of a rockfill dam. Its was stressed that the structure of this type of the dam is very subtle and stone material is laid in a very economical manner. The shape of the dam was determined by static calculations of minimum gradient of its slopes for the degree of safety for 1.5 of water (or 1.2 in case of a decrease of water level in the lake). The main construction material was a biotite or bismicaceous gneiss from the flooded area, partly hydro-thermally damaged. It was decided that the compaction would be made as economically as possible, only clay seal and transition layers from gravel sand with clay were compacted in the classic way.

During construction it was detected that the stone material contains 30 % grains smaller than 100 mm, and it had to be sorted. In spite of that the dam contains about 35 % of these fragments. Average dry compression strength was 98 N mm^{-2} (977 kg/cm^2), but after soaking by water and during frosts it decreased by about 30 %. It was necessary to change the proposed shape of the dam, as the angle of loose material was only 1:1.25, and to make three benches on both downstream and upstream sides. The original slope of 1:1.35 was then changed to 1:1.5. The thickness of clay seal was increased from a mere 2.0 m. The downstream stabilization part of the dam was poured in two layers to the height of 37 m with the use of hydraulic monitor and average ratio of water to poured stony material, 3:1-5:1. It can be stated that there were no negative effects visible on this part of the dam during its operation. The upstream part, poured in the layers of 6 m and not compacted at all, started to be deformed at the rate of up to 2 cm per day, which was the cause for the appearance of a crack on the dimension 448. The crack was parallel with the dam axis and in the depth of 4 m it led to the creation of a boundary

(*) *Modification du corps déformé du barrage de Jirkov.*