finncontact

FINNISH ROAD ADMINISTRATION

VOL. 9 / No. 2
June, 2001

Quarterly Newsletter of the Finnish Highway Transportation Technology Center, FinnT²

THE LAST YEAR OF THE FINNISH NATIONAL ROAD ADMINISTRATION PROVED TO BE SUCCESSFUL

THE HISTORY OF THE FINNISH NATIONAL ROAD ADMINISTRATION SPANS TWO CENTURIES, ALTHOUGH IT HAS WORKED UNDER DIFFERENT NAMES AND IN MANY FIELDS. AT THE BEGINNING OF THIS YEAR, TWO TOTALLY DIFFERENT AND SEPARATE ORGANIZATIONS, FOLLOWING IN THE AGENCY'S FOOTSTEPS, STARTED OPERATING.

THE ANNUAL REPORT CONCERNING THE YEAR 2000 APPEARED RECENTLY AND IT SHOWS THAT THE AGENCY WAS SUCCESSFUL IN TARGETING ITS ACTIVITIES WITHIN THE FINANCIAL FRAMEWORK.

The present **Finnish Road Administration (Finnra)** is responsible for public roads in Finland, and it commissions road production services from service providers. Like its predecessor, the Road Administration is a State agency. The **Finnish Road Enterprise** engages in the construction and maintenance of roads. It is a state-owned enterprise operating on business principles. Unlike its predecessor, the Finnish Road Enterprise operates in open competition with other contractors. However, open competition in road management progresses gradually and will be completely adopted by the end of 2004.

This new organizational model described above is supposed to be feasible from the beginning, i.e. it should increse the productivity of road appropriations without compromising state control over the assets.

As for the performance goals of the organization's last year, the Finnish National Road Administration achieved all of those set by the Ministry of Transport and Communications of Finland, except one.

In traffic safety, the aims included revision of speed limits in built-up areas and on main roads and a calculatory reduction of 44 personal injury accidents. Both these targets were met with a safe margin. Also in traffic, the calculatory impacts of safety measures seem to be achieved in full. All in all, it was possible to reach the lowest figure in traffic fatalities since the 1950's.

In traffic flow, the main objective was to maintain customer satisfaction among key road-user groups. The survey showed that this succeeded well. In addition, the goals regarding construction of bicycle and pedestrian ways and improvements in bus transport conditions were met.

The environmental targets of groundwater protection and noise abatement were achieved as well.

The agency was also successful in reducing the use of de-icing salt: the average level of 104,000 tons of salt was reduced to 81,000 tons.

In terms of road network condition, the performance target was that the length of paved roads in bad repair would increase by a maximum of

In 2000, Helsinki and Tampere were connected with a motorway as the construction of the section Iittala - Kulju was completed.

Also In This Issue:

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100 km per year. This target was not met, as the length of sub-standard roads increased by 190 km.

The disadvantages of structural frost damage on gravel roads were reduced in excess of the targeted 10 per cent.

As regards road management economy, the goals of reducing the Road Admnistration's operating costs and lowering the real cost level of maintenance were attained.

Introducing competition into road management was achieved: construction and maintenance contracts worth FIM 300 million and planning worth FIM 12 million were opened to competition.

The aim of improving the competitiveness of the agency's Production required scoring 300 points according to the Finnish Quality Prize criteria. This goal was met.

The organizational development of the Finnish National Road Administration was implemented under State supervision. The decisions made by the State authority with regard to the new organization were also implemented.

JARMO IKONEN

GLOBAL CHANGE OF ROAD ORGANIZATIONS

GENERAL CONCEPTS IN RESTRUCTURING OF PUBLIC ORGANIZATIONS

Many different approaches have been used when enhancing the efficiency of the public sector. These include the abolition of bureaucratic administration, the reduction, simplification or elimination of grant aid, a shift to competitive tendering for services, the privatization of institutions or parts thereof and reduction in staffing levels.

The general objective of restructuring road organizations around the world has been to make road provision operations more effective and efficient by introducing market orientated modes of operation. One of the approaches has been the Client-Producer Concept. It has been widely implemented during the last decade in restructuring government and municipal organizations with service delivery or productive functions on their purview. In the road sector that concept has been widely accepted as one of the leading concepts in improving efficiency, productivity and economy of road design, construction and maintenance works.

Privatization is the transfer of enterprises from the public sector to the private sector. It is usually comparatively easy to commercialize or privatize activities in an already competitive sector of the market. The creation of competition and the development of competitive conditions has been a more demanding undertaking. On the other hand, corporatization of state activities which are essentially a monopoly, should be retained in state ownership, at least until adequate competition is available, since private monopoly is even worse than state monopoly.

The general objective of restructuring road organizations could be the commercialization and privatization of all the road production and other road related operations that can operate on market based principles without jeopardizing traffic safety and traffic fluency on public highways and the legal rights of individual persons.

A gradual change has been considered essential in many countries for a new established road authority to acquire the necessary knowledge and skills for exposing all production, including maintenance, to competitive tendering. Also it has been considered to be the most effective way of creating a functional market for road provision activities.

WHAT FOLLOWS AFTER COMMERCIALIZING PRODUCTION ACTIVITIES

In the restructuring of the former Finnish National Road Administration (Finnra) during the past decade we tried to find a general restructuring concept suitable for our work. Mr. Antti Talvitie (World Bank) who previously was in charge of construction activities within Finnra has summarized the reform process that already has been occurring around the world by identifying a five-stage process.

Mr. R. J. Dunlop, General Manager of Transit New Zealand has extended the concept to six stages:

Phase I.
The traditional design, construction and maintenance organization. All the policy, regulatory and planning functions are mixed up with the actual physical implementation works. The organization takes care of government employing policy and employs a large number of employees.

Phase II.
The organization has identified client and production roles. More attention has been paid to the efficiency of the implementation works and to the

significance of cost consciousness. Comparing the prices of direct labor work and contracting-out-work has resulted in a growing share of contracting-out-work.

Phase III.
Separation of client and producer organizations within the same governmental organization. The organization pays increasing emphasis on traffic and road policy and environmental issues. The organization has an overall drive towards clarification of different roles and continuing demand for more efficiency. This has pushed the separation of different roles.

Phase IV.
Corporatization of the producer. In this phase government-owned production or service delivery functions that previously have been internally separated from client functions are corporatized or even privatized. Normally, a dedicated road fund appears in this phase.

Phase V.
Corporatization of the client functions. In this phase the client, the Road Administration would become the formal "owner" of the public road network on behalf of the government and manage the roads as a government corporation.

Phase VI.
Privatization of the client. That would also be, to some extent, privatization of the road network. This has happened to a limited degree in many countries as toll roads. No country has yet privatized the entire public road network. All toll road agreements have had an end date after which the road is returned back to the government.

The phases are depicted in the following figure.

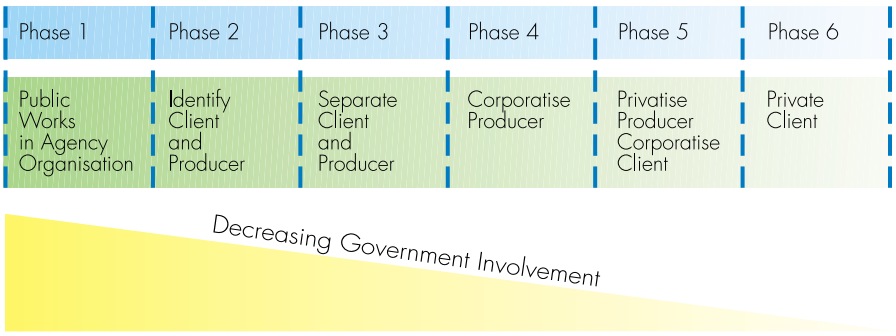

Figure 1. The phases in road organizations' reform.

Road agencies throughout the world are currently between phases I and IV, depending on the governments intension in the entire public organization reform. Each country has adopted different methods and different objectives in the reform process and moved at different rates but nearly all have moved through the phases in sequence without omitting any stage.

WILL ROAD FUNDS TAKE THE ROLE OF A ROAD ADMINISTRATION

Nearly all countries which finance their roads through the consolidated funds are short of revenues for investment and maintenance of roads. Improved utilization of the road budget has helped to narrow the financing gap, but not eliminate it. Faced with an acute shortage of funds, many road agencies have introduced tolls on high volume roads. However, the tolls have had a relatively small impact on the financing problem. Therefore many countries have attempted to solve the financing problem with special road funds. A large number of countries set up road funds during the 1970's and 1980's, and a number of similar road funds were set up in Eastern Europe during the early 1990's.

The establishment of a road fund has usually been connected to a wider agenda to commercialize road management. Most of the new road funds are managed through a separate road fund administration, because these road funds are attempting to bring all roads under regular maintenance and have to channel funds to several different road agencies. The road fund staff normally collate the road programs prepared by the various road agencies, review them and consolidate them into national road programs. That kind of programming and financing tasks have previously belonged to the duties of a traditional ministry of transport or state road administration.

FINNRA AS AN EXAMPLE IN THE DEVELOPMENT OF ROAD ORGANIZATIONS

In the 1950's and 1960's Finnra was responsible for highways, waterways and airports. It was a self-contained organization that was responsible for policy/regulatory functions and also for production activities. However, when the main infrastructure network was constructed in Finland Finnra used private contractors to balance its own workload. During the following decade Finnra carried out a comprehensive work in developing work planning, and reporting systems and training the entire production staff to use the systems. The enhanced cost consciousness resulted in an increased use of private contractors, because of the lower price level of private contractors. In that decade the number of Finnra's own direct labor force started its rapid decrease.

This development phase continued throughout the1980's, and some pilot projects submitting its own labor force into competition with private contractors, were carried out. At the end of the decade, about 50 % of road design works, 70 % of road construction works and 25 % of road maintenance works were executed by private consultants and contractors. Despite the above mentioned steps, the development was focused on the efficiency of production activities. The client and production roles were still confused and all the steps belonged to the global development phase I.

In the 1990's, it was understood that by continuing in this direction of development Finnra would not give the production staff any chances to compete on equal conditions with the private sector. The government organization form with its rigid structures and better benefits of employees was seen as a hindrance to competition. Although these facts were evident the labor unions were against separating the client and production activities and especially against commercializing of road design, construction and maintenance works. However, Finnra started a

determined restructuring of the organizations and several steps were planned and carried out:

- In 1990, the Navigation Administration was commissioned to undertake the management of waterways which had previously been one of the duties of the Road Administration.
- In 1993, Finnra's head office was reorganized. Finnra's expert and service functions were converted into independent, financially accountable service centers with a baseline personnel of about 420. However, this restructuring concept didn't completely follow the idea of client-producer concept.
- In 1994, the network of Finnra's repair shops was converted into a separate public enterprise called RASKONE which is responsible for servicing and repairing heavy machinery. In the beginning of 1998, it was converted into state owned joint stock company.
- In 1995-1997 Finnra's district organizations were restructured in several small steps. The administrative functions were gradually separated from the implementation functions under the regional director and an internal contract agreement procedure between administration and production was developed.

In 1994-1996 two different committees nominated by the Ministry of Transport and Communications of Finland were working on restructuring Finnra. The main idea in the restructuring and the proposal of the latter committee was the separation of road administrational works (planning, programming and purchasing the road design, construction and maintenance works) from the actual implementation works into two different organizations: a road administration and a state owned Road Enterprise.

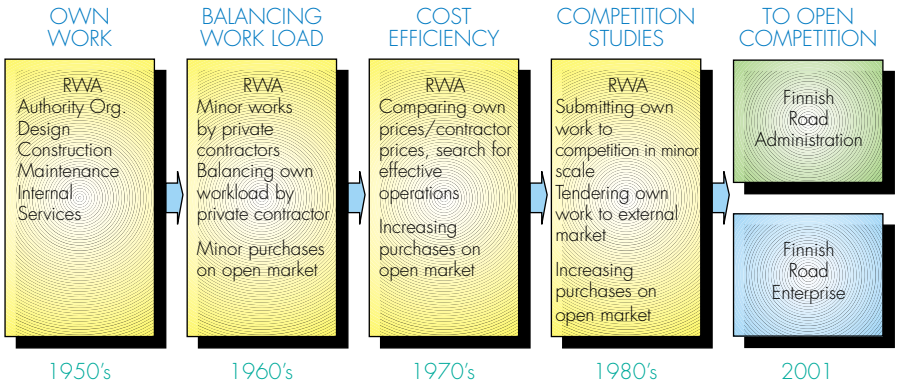

Figure 2. The development phases of Finnra.

The proposed renewal was most strongly criticized and resisted by the labor unions and the contracting sector. Based on preliminary stands taken by parliamentary groups, the Ministry of Transport and Communications decided in the spring of 1997 that the realization of the renewal in its then form appeared so difficult it was expedient to postpone it.

But, to ensure the continuation of Finnra's development, the Council of State approved a model of separation of Finnra's road administration and production internally more clearly. On the basis of the revised statute, beginning on January 1, 1998, Finnra was reorganized into two separate organizations under a Roads Board and a Director General: road administration and production.

After a long preparation period and political negotiations the Finnish Council of State finally decided in 2000, that the new organizations, the Finnish Road Administration and the Finnish Road Enterprise will begin their operations in the beginning of 2001. The road design, construction and maintenance works of public roads will be opened up for unrestricted competition gradually during a 4 years' transition period in 2001-2004.

In the restructuring Finnra attempted to skip one of the previously described phases, namely phase number III and go directly to phase IV. However, the result was that we have to go through all the development steps although we can see several following phases ahead.

The development of Finnra is depicted in Figure 2.

Mr. MARKKU TEPPO, Finnra

FINNISH GOVERNMENT'S RESOLUTION ON IMPROVING ROAD SAFETY

Road safety improved rapidly in Finland from 1990 until 1996, after which no further improvement has been observed. In 1999, traffic fatalities amounted to 431, and injuries to 9052. The target set by the Finnish government for the past decade to halve the number of fatalities was not achieved.

On international standards, the road traffic safety level in Finland is high. In 1999, 8.3 persons per 100 000 inhabitants were killed in road traffic accidents. In comparison between the Nordic countries, Finland is on a lower level than Sweden and Norway but on somewhat higher than Denmark.

ROAD SAFETY TARGETS

In 1997, the government adopted a resolution on improving road safety. It set a target for 2005 to constantly improve road safety so that the number of fatalities and the most serious injuries would decrease as rapidly as in the 1990's and that Finland would approach the safety level of Sweden and Norway. By 2005, the annual number of traffic fatalities would be lower than 250.

Recently, on 18 January 2001, the Finnish government adopted a new resolution on improving road safety. The government re-estimated its road safety target set in 1997 so that in 2010 the number of traffic fatalities must be below 250.

In the long term, the government will adopt a road safety vision for Finland, according to which the road transport system must be designed so that nobody should die or be seriously injured on roads. The transport system should be improved continuously, with the target of no more than 100 traffic fatalities per year by around 2025.

This ambitious long-term vision means that safety will be the primary goal of the transport policy. This "Vision Zero" is based on the Swedish and Dutch models. The responsibility of the Finnish Road Administration (Finnra) for safe traffic environment increases noticeably, but road users are still responsible for observing the rules. Human error should not lead to a fatal accident.

Targets adopted by the government require a considerable road safety input over the next five years. The Road Safety Programme 2001-2005 is a wide-ranging, nationwide programme, which sets out the measures with which progress can be made towards targets. Implementation of the entire programme is estimated to reduce 120 traffic fatalities per year. The total cost of implementing the entire programme is FIM 3.9 billion (EUR 0.66 billion).

LONG-TERM MEASURES

The Road Safety Programme 2001-2005 has three principles for longer-term transport policy, which will improve the conditions of road safety work. They are increasing the appreciation of road safety issues, curbing traffic growth, and utilizing technology effectively.

Appreciation of road safety issues will be enhanced by achieving political acceptance for the long-term vision. More resources will be reserved for traffic safety work in both state and municipal administrations. The importance of road safety will be given further emphasis by transport operators and elsewhere in business life.

Traffic growth will be curbed by favouring integrated urban structures adapted to public transport, walking and cycling. Competitiveness of public transport will be improved and walking and cycling will be promoted.

The rapid development of technology can benefit the entire transport system, for instance in monitoring and guiding traffic behaviour and in driver support and monitoring systems. It will be ensured that new technical systems and equipment do not increase the risk of traffic accidents and that the safety requirements are met before they are taken into general use.

BUILT-UP AREAS

80-90 % of all injuries to pedestrians and cyclists occur in built-up areas. The Road Safety Programme requires that those areas will be planned with the needs of the most vulnerable road users in mind. An example of successful planning is presented in Figure 1.

Figure 1. A built-up area with many successful road safety related solutions.

There is a general speed limit of 50 km/h in built-up areas. Nowadays more than 60 % of streets in large cities have speed limits of 30 or 40 km/h, but in smaller municipalities the figure is only about 35 %. The system of progressive speed limits will be expanded. A new guide of planning speed limits in built-up areas was issued in 2000. Speed limits will be accompanied by road design modifications. There are also villages and roadside settlements outside conventional built-up areas where speed limits need to be checked.

Places where non-motorized traffic crosses busy roads and streets should be planned carefully. Networks of cycle paths will be expanded.

SINGLE ACCIDENTS AND HEAD-ON COLLISIONS

Head-on collisions and running off the road accidents cause three quarters of all traffic fatalities involving motor vehicles. The Road Safety Programme considers that control over driving speeds should be improved in order to prevent these accidents.

The existing system of speed limits should be reviewed. The need to extend road-specific speed limits to cover roads outside the main road network will be examined. On the basis of that examination a decision will be made on general speed limits. Nowadays the general speed limit outside built-up areas is 80 km/h, but conditions on particular roads with a general speed limit already force drivers to keep their speeds lower. The need to extend winter speed limits and adjusted speed limits will be examined.

Automatic speed surveillance will be expanded to cover at least 800 kilometres of main roads. In order to make the surveillance more effective and comprehensive, opportunities to amend the current legislation so that penalties for minor speeding would be imposed on registered vehicle users will be explored. Systems providing drivers with information on driving speeds will be introduced.

The Road Safety Programme contains also other than speed-related measures, which reduce single accidents and head-on collisions or minimize their consequences. Problems caused by new settlements along main roads will be dealt with through cooperation between municipalities and provinces. New solutions, such as roads with median barriers, will be experimented on single-carriageway main roads. Provision of information on driving conditions will be improved. Roadside environment along main roads will be softened to minimize consequences of running off the road.

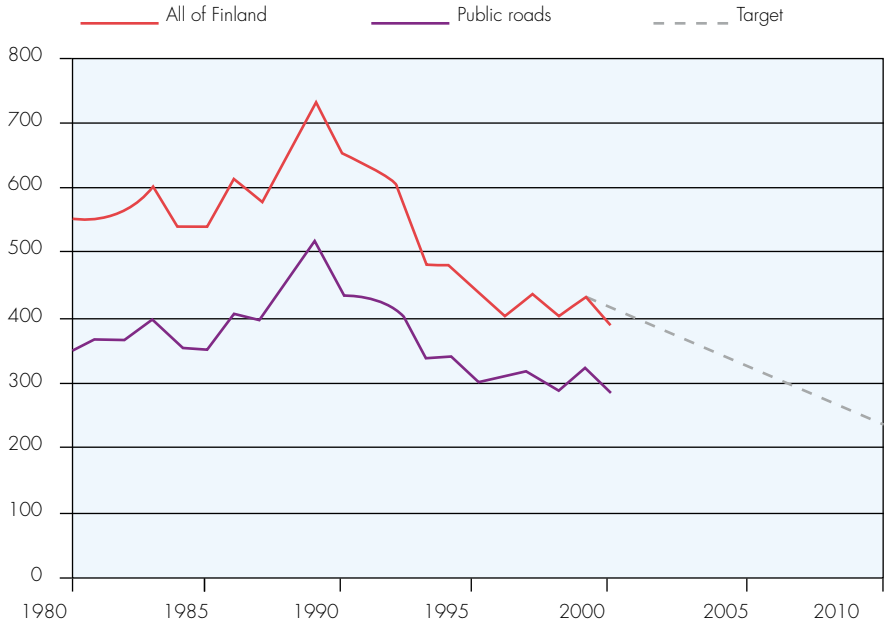

Figure 2. Killed in road traffic accidents 1980-2000 and the target set in 2001.

INFLUENCING DRIVERS

Alcohol is a contributing factor in about one quarter of all fatal accidents in Finland. Alcohol consumption is expected to increase during next five years. The Road Safety Programme suggests that lowering the blood alcohol limit for drunken driving from 0.5 to 0.2 mg per litre will be considered. Also zero limit for drugs should be considered.

The proportion of elderly people is increasing. The Road Safety Programme requires that further training should be available for elderly people to maintain their driving ability. Those who no longer are able or willing to drive should be provided with other mobility opportunities. New systems for monitoring the health and driving ability of elderly people should be introduced.

It is estimated that telematics equipment installed in vehicles will increase the accident risk during driving by about 25 %. The Road Safety Programme suggests that an approval procedure for telematics equipment used in vehicles should be introduced. The use of mobile phones without a hands-free facility should be banned.

IMPLEMENTATION OF THE ROAD SAFETY PROGRAMME

The target of no more than 250 fatalities in 2010 (see Figure 2) is very demanding. It can be achieved only if the Road Safety Programme is implemented on the whole, but it is possible only if more resources are allocated to traffic safety work. The most serious resource problem is in the police traffic surveillance. Finnra is not able to implement the required improvements of the main road network with existing resources. Promoting public transport, walking and cycling may also need central governmental funds. Some profitable measures like lower speed limits are unpopular. The commitment of politicians to the safety objectives is of crucial importance for implementation of the Road Safety Programme.

For more information on the government resolution on improving road safety and the Road Safety Programme 2001-2005 on the Internet pages of the Ministry of Transport and Communications of Finland, http://www.mintc.fi/www/sivut/dokumentit/liikenne/turvallisuus/turvallisuuseng.htm.

Ms. RIIKKA RAJAMÄKI, Finnra

COMPETITION TO CALCULATE SETTLEMENTS AT HAARAJOKI TEST EMBANKMENT

The reliable calculation of settlements is important for the overall economy of a road project as well as for traffic safety and smoothness of traffic flow. However, it is usual that settlement calculations are inaccurate and the mode of presentation is insufficient. The Finnish National Road Administration (Finnra) organized a competition where the task was to calculate settlements of an embankment, lateral displacements and pore water pressure changes in the soil, as accurately as possible. Also attention was paid to the presentation of the calculations and choosing the calculation method.

1. BACKGROUND OF THE COMPETITION

The goal of the competition was to get an idea from the existing standard of the settlement calculations and how to improve it. The competition was arranged in two stages. In the first stage, where only Finnish geotechnicians were invited, there were soil and laboratory investigations according to conventional practice. In the second stage the investigations were completed and parameters were available for using new calculation methods. In the second stage invitations to the competition were also sent to several foreign universities and associations. The construction plan and schedule as well as other materials were sent to the contestants.

The answers were left in spring 1997 and the Haarajoki test embankment was constructed during the same summer. The embankment was observed for two years and the final measurements for the competition were made in autumn 1999. The experiences accumulating from the competition will be used to develop general guidelines for calculating settlements. The competition is a part of a larger project in Finnra, called Road Structures Research Programme.

Figure1. The embankment on which settlements were to be calculated.

2. HAARAJOKI TEST EMBANKMENT

2.1 Geometry and soil properties

Haarajoki test embankment (see Figure 1) is 8 m wide from the top, 3 m high and 100 m long as shown in Figure 2. It is constructed on soft clay, partly onto a vertically drained area and partly with no ground improvement. The length of both parts is 50 meters. The material of the embankment is gravel with a density of 21 kN/m^3. The subsoil is overconsolidated clay and silt with a combined depth of 20 meters.

To measure the behaviour of the embankment and soil underneath, several types of instruments were installed. There are altogether 27 settlement plates, several pore water pressure probes and inclinometers in the embankment.

2.2 Observation results

The instruments were mainly installed before construction, so it was possible to have quite reliable initial measurements. In the vertically drained area, the instruments were installed after the strip drains. Settlement plates were leveled several times before and during construction. After the construction of the embankment was finished the measurements were made every week and during the first months the interval was increased to three months.

The time-settlement curves both halves of the embankment are presented in Figure 3. The original idea of the vertical drained part of the embankment was to get an idea of the total or at least 90 % primary consolidation settlement. Also it is obvious that the vertically drained embankment is still in the primary consolidation state. In real road construction cases the same kind of problems have occurred. To get more information about the problem, samples from the strip drains were taken after the last measure-

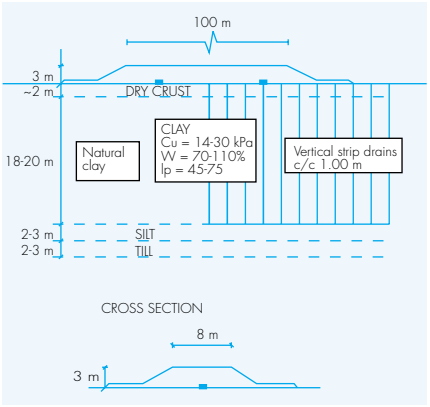

Figure 2. Haarajoki Test Embankment.

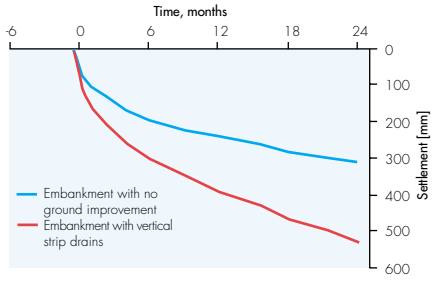

Figure 3. Settlements of the Haarajoki Test Embankment.

ments for the competition were made. If there is nothing to comment on about the quality of the strip drains, the reason for the slow settlement of the embankment could be the smearing effect or disturbance of the clay. Also the dry crust layer is quite thick and shares the loading. The aim is to find out what the reasons are for the unpredictable slow consolidation progress. If those reasons are found, it shall be one of the greatest profits of the whole competition project.

3. RESULTS OF THE COMPETITON

3.1 Answers and observations

In the first stage, where only Finnish geotechnicians were invited, the soil and laboratory investigations were conventional. Ground investigations included several different soundings as cone penetration tests, vane tests and Swedish weight sounding tests. Ground water level was observed at both ends of the embankment area. The laboratory tests included classification tests and several incremental loading and CRS -oedometer tests. In the second stage results from the triaxial tests were given as well as initial in situ pore water pressure measurements. Totally the materials concerning the competition was quite large, especially the number of laboratory measurements.

Six answers were accepted in the first stage, in the second stage five answers. Only answers including logical calculations were accepted.

Results of the settlement calculations of the contestants compared to the observation results is presented in Figure 4 (settlement of the embankment with no ground improvement) and Figure 5 (settlement of the vertically drained embankment). Deviation of the answers in settlement calculations is large.

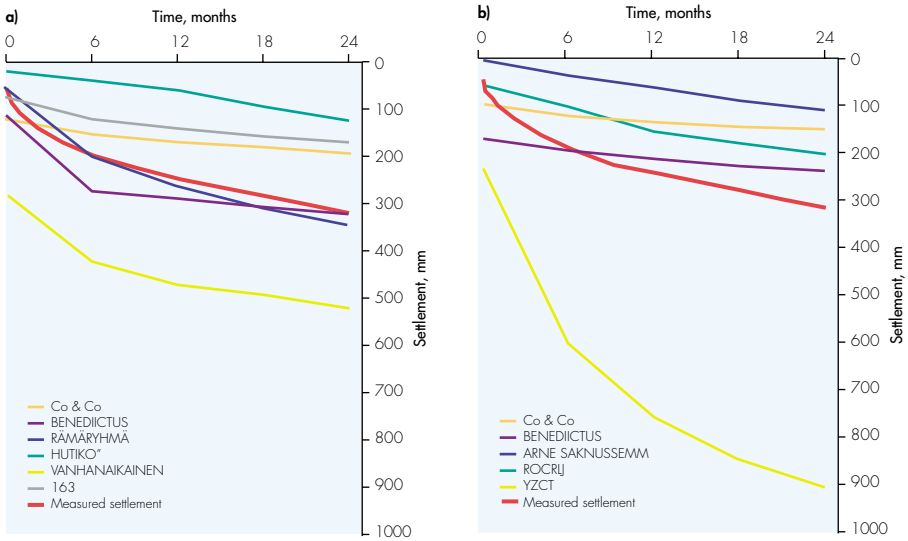

Figure 4. Calculated and measured settlements of the embankment with no ground improvement. a) Answers in first stage (conventional soil and laboratory investigations) b) answers in the second stage (completed investigations).

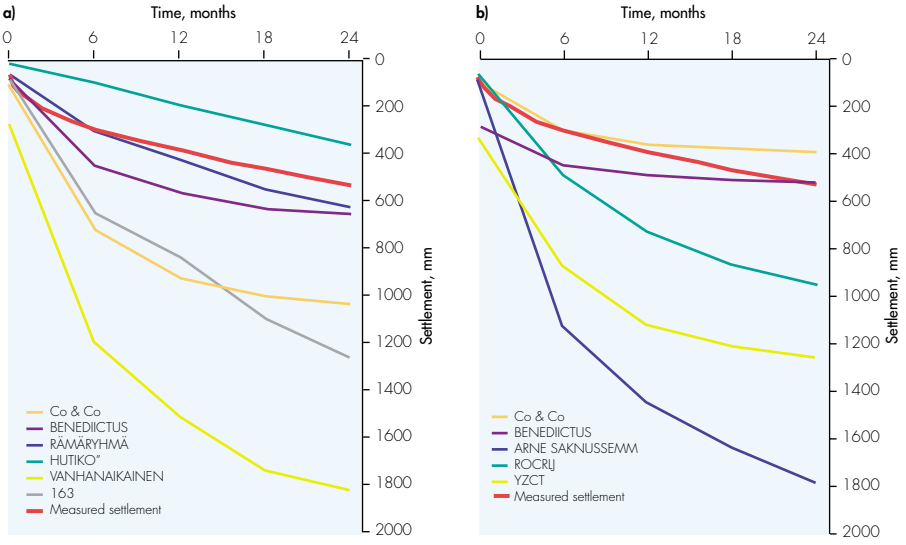

Figure 5. Calculated and measured settlements of the embankment with vertigal strip drains. a) Answers in first stage (conventional soil and laboratory investigations) b) answers in the second stage (completed investigations).

4. CONCLUSIONS

The contestants did great work leafing through all the materials given for the competition and produced well studied calculations. The results of the competition show that accuracy of the settlement calculations is not always very good. In this case it is obvious, that the clay underneath the embankment is overconsolidated, very sensitive and layered, and also that the dry crust layer is thick. The case could be considered very difficult despite very thorough soil and laboratory investigations. There is still much to do in order to get settlement calculations to a more reliable level. The Haarajoki Test Embankment is observed for at least for a year after the competition. The function of the vertical strip drains and strengthening of the subsoil will also be studied. After a year the embankment will be made higher in order to act as a noise barrier.

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