

E U R O P E A N U N I O N - T A C I S

**Technical Assistance to the Southern Republics of the CIS
and Georgia - TRACECA**

TRADE AND TRANSPORT SECTORS

**IMPLEMENTATION OF PAVEMENT MANAGEMENT SYSTEMS
PROJECT NO.: TELREG 9305**

**STUDY TOUR TO EUROPE
IN**

NOVEMBER 1996

**KOCKS CONSULT GMBH
Consulting Engineers
Koblenz / Germany**

in association with

**TECNECON, Economic
and Transport Consultants
London / U. K.**

**PHØNIX
Pavement Consultants
Vejen / Denmark**

Kocks Consult GmbH · P. O. Box 10 60 · 56010 Koblenz · FRG

The European Commission
Directorate General I A
External Relations
88, Rue d'Arlon

B-1040 Brussels

Tacis IA/C/7

Attn. Mr. D. Stroobants

Ref

243/Wi-ns/1739

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Koblenz

08.01.1997

Dear Sir,

***TRACECA Project: Implementation of Pavement Management Systems
Project Number: TELREG 9305***

We take pleasure in submitting to you our special report on the **Study Tour to Europe** which took place in November 1996.

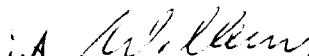
The report is submitted in six copies, five bound and one loose leaf.

Yours faithfully

KOCKS CONSULT GMBH
Consulting Engineers



Werner P. Weiler



Ulrich Willems

Copies to: TACIS CU, all 8 recipient states
(one bound and one loose leaf each)

COVER PAGE 1

STUDY TOUR TO EUROPE 11/96

REPORT COVER PAGES

Project Title	:	Traceca Project - Implementation of Pavement Management Systems
Project Number	:	TELREG 9305
Country	:	The Southern Republics of the CIS and Georgia

	Local Operator	EC Consultant
--	----------------	---------------

Name	:	Concern UZAVTOYUL	KOCKS CONSULT GMBH Consulting Engineers
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Signatures	:		

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Signatures	:		

COVER PAGE 2

STUDY TOUR TO EUROPE 11/96

	Local Operator	EC Consultant
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Signatures	:	

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Signatures	:	

COVER PAGE 3
STUDY TOUR TO EUROPE 11/96

Local Operator	EC Consultant
----------------	---------------

Name	: Concern TUKMENAUTOELLARI	KOCKS CONSULT GMBH Consulting Engineers
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Signatures	:	

Name	: State Concern of Roads, SAKAVTOGSA	KOCKS CONSULT GMBH Consulting Engineers
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COVER PAGE 4

STUDY TOUR TO EUROPE 11/96

Local Operator	EC Consultant
----------------	---------------

Name	: Armenian Road Directorate (ARD)	KOCKS CONSULT GMBH Consulting Engineers
Address	: Yerevan ARMENIA	
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Contact person	: Nikolai Elarian, Director (ARD)	
Signatures	:	

Name	: Ministry of Transport and Roads TAJIKIPROTRANSSTROY	KOCKS CONSULT GMBH Consulting Engineers
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Fax number	: (3772) 212020	
Telex number	:	
Contact person	: Mirzoev Timur Dodojenovia	
Signatures	:	

COVER PAGE 5
STUDY TOUR TO EUROPE 11/96

Date of report : 20. December 1996

Reporting period : November 1996

Author of report: W. P. Weiler, Project Manager (Kocks Consult GmbH)

EC M & E Team

(name) (signature) (date)

EC Delegation

(name) (signature) (date)

TACIS Bureau
(Task Manager)

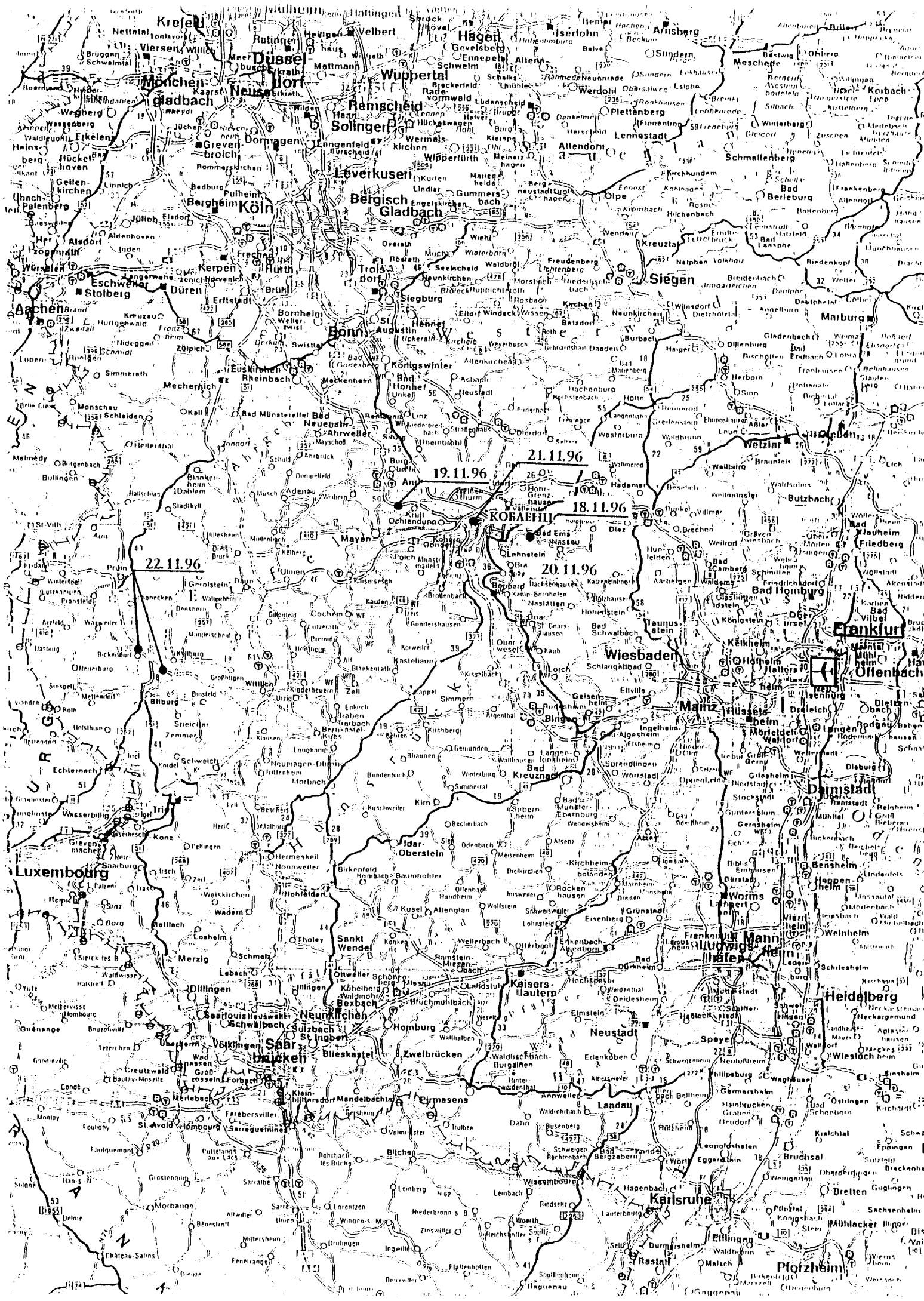
(name) (signature) (date)

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1. INTRODUCTION

In the framework of the TACIS TRACECA Project for the implementation of pavement management systems a study tour for staff of the recipient institutes was organised from 18.11. to 22.11.1996 in Koblenz, Germany.

The objective of the study tour was to give the participants an overview over the actual Western European

- organisation of road administration
- organisation of road and bridge maintenance
- road maintenance methods/techniques
- bridge maintenance methods/techniques
- winter maintenance
- road safety measures including construction sites

For this purpose the emphasis of the study tour was laid on visits of relevant organisation/administration, plants and their application on site (site visits) and on accompanying seminars to explain and demonstrate the engineering and scientific background. Furthermore questions were discussed in the seminars and on site with the responsible specialists.

The visit of the road administration of Rhineland Palatinate, a road- and a motorway maintenance unit, an asphalt mixing plant manufactures of road and pavement construction equipment as well as several construction sites in and in the vicinity of Koblenz were essential parts of the study tour.

2. ORGANISATION

Beginning of September 1996 the Consultant contacted the recipient institutes in the eight project states to receive the names and passport details of the participants. Upon receipt of the requested details invitation letters were forwarded to the recipient institutes and copied to the German embassies for provision of visa. The Consultant's staff in the project area provided the participants with the tentative programme for the planned study tour, air tickets to Europe (Frankfurt/Germany), where necessary the transport to and from the airport and assisted in obtaining the visa at the German Embassy.

Due to the various flight connections from the recipient states to Frankfurt/Germany the participants arrived from Friday 15th November to Monday 18th November 1996. At each of the four days of arrival the Consultant picked up the participants at the airport, went by train together to Koblenz and accompanied them to the hotel. For convenience the hotel determined is situated in the centre of the township of Koblenz and is also opposite the head office of KOCKS CONSULT.

All days the study tour members were accompanied by the Consultant's staff including those speaking Russian language, who also were available after office hours to visit cultural and historical interesting points in and in the vicinity of Koblenz.

After completion of the study tour the participants left Koblenz to Frankfurt Airport between Saturday 23rd November and Monday 25th November 1996 to return to their home countries.

3. PARTICIPANTS

NAME	COUNTRY	ORGANISATION
Almuradov Mamed	TURKMENISTAN	Concern TURKMENAUTOELLARI Chief of Maintenance Department
Alimov Abdusalom Mukumovitsch	UZBEKISTAN	Concern UZAVTOYUL Roadinspector
Akunov Kubanitschbek Akunovitsch	KYRGYZSTAN	Ministry of Transport Head of Road Department
Jusupov Nail Nadirovtsch	KAZAKHSTAN	Company KAZDORNII Chief of Department
Juldaschew Jurij Asisowitsch	TADJIKISTAN	"TADJIKGIPROTRANSSTROY" Chief Engineer
Kasarjan Bagrat	ARMENIEN	Armenian Road Directorate
Mdiwnischwili Tariel	GEORGIA	Concern SAKAVTOGSA Deputy Chairman
Muchtarsade Ibragim Gambar ogli	AZERBAIJAN	Concern AZERAVTOYOL Director of Directorate
Klaus Betzinger	GERMANY	KOCKS Consult GmbH Managing Director
Werner P. Weiler	GERMANY	KOCKS Consult GmbH Project Manager
Carsten Griese	GERMANY	KOCKS Consult GmbH Team Leader
Marina Vassermann	GERMANY	KOCKS Consult GmbH Technician - interpreter
Ditmar Peters	GERMANY	KOCKS Consult GmbH Technician - interpreter

4. THE STUDY TOUR

First day, Monday, 18th of November 1996

At 9 a. m. the participants were welcomed in the head office of KOCKS CONSULT in Koblenz by Mr. Klaus Betzinger, Managing Director. A summary of the firm's history and the actual scope of services in the different fields of activity in the branches was presented. Then Mr. Betzinger detailed the programme and the objectives of the study tour and a briefcase was handed over to each participant including documents and information on the study tour, a part of which is shown in the Appendix to this report.

Afterwards each participant gave a short personal presentation explaining his responsibilities, the road network of his country, the problems concerning road maintenance and repair. The participants were then guided through the different departments in the head office of KOCKS CONSULT and the respective head of department

- Mr. W. P. Weiler (road, traffic and airports, overseas)
- Mr. P. Funk (roads and traffic, Germany)
- Dr. Hartmann (structural engineering)
- Mr. Leinhos (environmental and sanitary engineering)

gave a brief overview of their activities and projects. Various computer equipment and programme systems used for the project works were demonstrated.

In the afternoon the participants went to the road maintenance unit of the road department Diez near Bad Ems. The head of the department explained tasks, organisation and activities of the unit which is responsible for the maintenance of 250 km of roads and highways. The tasks comprise maintenance of road surface and structures. According to the requirements of the season a winter maintenance plan is prepared by the department to keep the roads passable even during black ice and snow. Furthermore the fleet of vehicles was explained, e. g. Unimog as well as the other equipment and the workshop for maintenance and repair of the vehicles was visited.

The documents for the first day of the study tour are given in Appendix 1

Second day, Tuesday, 19th of November 1996

In the morning of the second day the road administration of Rhineland Palatinate (Landesamt für Straßen- und Verkehrswesen Rheinland-Pfalz) in Koblenz was visited. Mr. Krüll (head of department) explained the organisation of the administration concerning road construction, maintenance and repair for the federal state Rhineland Palatinate. The road administration comprises:

- 9 road departments (Straßenverkehrsamt) with 10 road maintenance units
- 6 planning departments (Straßenprojektamt)
- 1 motorway department with 15 motorway maintenance units and one communication unit

Mr. Krüll explained the system for financing roads in Germany and the budgeting of the regular costs for maintenance. Each participant was given figures, diagrams and schemes showing this financial concept (see Appendix 2).

In the afternoon the study group went to the motorway maintenance unit near Mendig at the motorway Köln - Ludwigshafen (A 61). Mr. Leindecker, the head of the unit, informed the participants about the tasks for maintenance and inspection of the 60 km of motorway (A 61) which the unit is responsible for. This section of the A 61 is now 20 years old and will receive an asphalt concrete overlay as major maintenance measure within the next 5 years. The works have already commenced.

Mr. Leindecker explained the motorway unit's advanced information system which enables them to take early measures e. g. against black ice. This system consists of a sensor in the road surface which measures temperature and humidity of the road surface and transmits the data to the computer system installed at the motorway maintenance unit. Further sensors measure atmospheric humidity, temperature, wind speed and wind direction and transmit the data to the computer as well. In addition the weatherforecast for the next 24 hours prepared by the meteorological service is accessed. All these data are compiled and evaluated by the motorway unit's computer system so that the condition of the road surface influenced by the local weather can continuously be forecasted for a period of 3 hours. This enables to make an early plan of action e. g. when formation of black ice is expected and the road surface can be treated with salt to prevent traffic congestion and accidents.

Afterwards the section of the A 61 was inspected where bituminous material for overlay was being placed by a paver with a width of 12.5 m.

Third day, Wednesday, 20th of November 1996

In the morning Messrs. BOMAG, a firm which produces road construction equipment was visited. Mr. J. Beatt welcomed the participants and introduced his firm. He informed that the equipment production of BOMAG has 22 % share of the world market, which is equivalent to a turnover of 650 million Deutsch Mark per year. BOMAG has branches e. g. in the United States of America, in South Africa and in Japan. Afterwards Mr. Weberbach guided the study group through the production halls where the production of various machines was explained. The participants had a number of questions which were discussed e. g. concerning an equipment which can measure the density of different soils types.

After a lunch break the group went to Messrs. WIRTGEN where they were welcomed by Mr. Gerntke who explained the organisation of his firm in fluent Russian. After this introduction the production hall and the workshops for road pavement equipment were visited and a video about the application of Wirtgen equipment in the C.I.S. was shown.

Fourth day, Thursday, 21st of November 1996

In the morning German road and bridge standards, e. g. 'Richtlinien für die Standardisierung des Oberbaus von Verkehrsflächen' (Standardised Pavement Design) were explained and discussed with the participants in the head office of KOCKS CONSULT in Koblenz.

Afterwards the group went to Bubenheim to visit an asphalt mixing plant of Messrs. Teerbau. The participants were given a brief introduction into the firm's activities. After visiting the laboratory Mr. Legth, head of Koblenz branch, showed and explained the mixing plant including the computerised mixing process.

In the afternoon the participants returned to KOCKS CONSULT's head office where an electronic theodolite and the transfer of survey data to a computer

programme, evaluation/calculation of the survey data and production of a plot was demonstrated.

Fifth day, Friday, 22nd November 1996

At the last day of the study tour two bridge sites at the motorway A 60 were visited (Kylltal bridge and Nimstal bridge). The Kylltal bridge is situated in a newly constructed road section of the motorway A 60 and consists of two separate parallel structures north and south. The structural system is an arch restrained at both ends. The bridge deck is spandrelled on the arch and restrained at the arch crest.

The technical data are

length of structure	645 m
height above ground	93 m
road width	11.5 m (each direction)
road surface	19.000 m ²
concrete quantity	46.000 m ³
structural steel	5.190 t
costs	60 mill. DM (3,150 DM/m ²)
construction period	5 years

The Nimstal bridge is situated in the motorway section between Bitburg (E 42) and Badem (B 257) where the existing two lane road respectively bridge is being upgraded to four lanes. Construction works for this bridge commenced in 1996.

The technical data are

total span	781.5 m
height above ground	64.00 m
road width	11.5 m
costs	18.1 mill. DM

At the end of the study tour all participants and engineers of KOCKS CONSULT working in the TRACECA States met for dinner where the impressions of the last days were recalled and further questions were discussed.

APPENDIX A 1

Presentation of KOCKS CONSULT GMBH

FIRM PROFILE

KOCKS CONSULT GMBH is an independent firm of planners and consultants founded in 1946 by Friedrich Kocks, Dr. Ing., Dr. Ing. h.c. The firm employs 360 engineers, architects, planners, environmental experts and instructors, collaborating to offer clients a wide range of services. Including KOCKS CONSULT's affiliated companies, there are 600 employees ready to tackle even the most complex tasks.

The range of services offered by KOCKS CONSULT GMBH includes studies and surveys, ecological, economic and engineering expertises, cost and quantity calculations as well as feasibility studies, preliminary and final design. After successful conclusion of the actual planning work, the KOCKS team draws up the necessary tender documents, carries out bid evaluations and supervises construction work and equipment installation. If required, we are also in a position to take over the entire project management, including the financial transactions involved in it. We can offer technical consultancy work during commissioning and train the client's staff to carry out operation and maintenance.

In almost 50 years of successful work, KOCKS CONSULT's engineers have gathered a wealth of experience in the following areas:

- transportation and traffic planning
- structural engineering
- civil engineering
- water management
- environmental assessments
- industrial engineering
- advanced technical training
- waste management.

KOCKS CONSULT's foreign activities began in the early 50s with work on a project in Luxembourg. Within only a few years, this led to numerous activities worldwide:

Europe:	Austria, Bulgaria, Czech Republic, Germany, Greece, Italy, Latvia, Luxembourg, Poland, Russia, Slovak Republic
Africa:	Botswana, Burundi, Cameroon, Ethiopia, Gambia, Ghana, Libya, Malawi, Mali, Mauritania, Morocco, Niger, Nigeria, Somalia, Sudan, Tanzania, Togo
Asia:	Afghanistan, Armenia, Azerbaijan, Bahrain, Bangladesh, China, Georgia, Indonesia, Iran, Kazakhstan, Kuwait, Kyrgyzstan, Malaysia, Maldives, Pakistan, Papua New Guinea, Saudi Arabia, Singapore, Solomon Islands, South Korea, Tadjikistan, Thailand, Turkey, Turkmenistan, Uzbekistan, Yemen
Central America:	Belize, St. Vincent & the Grenadines
South America:	Bolivia, Brazil, Chile, Ecuador

KOCKS CONSULT GMBH has its head office in Koblenz, only a short drive from Federal German Government offices in Bonn and from the economic centres of Frankfurt/Rhine-Main. Registered offices are maintained in both places. **Intraplan Consult GmbH (ITP)** established its headquarters in Munich in 1980 and is active in the fields of traffic analysis, prognosis and economic surveys. **Luxplan S.A.** has been working as an independent company in the sector of transportation management in Luxembourg and in French-speaking Africa since 1981. **UTS Umwelt Technik** was founded in 1994 and is working as environmental consultant and water and waste management specialist. In 1995, **IMC Ingenieur Management Consult GmbH** was founded as another holding in the field of project management, acoustics & sound absorption, thermal protection and transport & economy. KOCKS' holding in the **Verkehrs- und Ingenieurbau Consult GmbH (VIC)** in Potsdam is particularly important for the future development of the group. It is a firm of equal size and also has over 40 years of experience in transportation management work. KOCKS CONSULT's activities in the new federal states in Eastern Germany are being supplemented by its holding in the **Ingenieurgesellschaft Umwelt und Tiefbau mbH (IGUT)**, Erfurt and the **kocks-rebo gmbh**, Eisenach.

In all KOCKS firms, the managers and directors are partners and participate in the company with personal capital. Professional capability is thus tied to financial interest, assuring the client an utmost accuracy in project execution by all KOCKS CONSULT's engineers. Modern technical equipment and up-to-date intelligent software available today supports the work of our well qualified staff.

KOCKS CONSULT GMBH - REGISTERED WITH:

ADB	Asian Development Bank, Manila, Philippines
ADFAED	Abu Dhabi Fund for Arab Economic Development, Abu Dhabi, United Arab Emirates
AFESD	Arab Fund for Economic and Social Development, Kuwait
AFRDB	African Development Bank, Abidjan, Ivory Coast
BADEA	Arab Bank for Economic Development in Africa, Khartoum, Sudan
CDB	Caribbean Development Bank, Barbados
EBRD	European Bank for Reconstruction and Development
EDF	European Development Fund
EEC	European Economic Community, Brussels, Belgium
GTZ	Gesellschaft für Technische Zusammenarbeit mbH, Eschborn, Germany (German Agency for Technical Cooperation)
ICAO	International Civil Aviation Organisation, Montreal, Canada
IDB	Interamerican Development Bank, Washington D.C., USA
KFAED	Kuwait Fund for Arab Economic Development, Kuwait
KfW	Kreditanstalt für Wiederaufbau, Frankfurt, Germany (German Bank for Reconstruction)
OECD	Organisation for Economic Cooperation and Development, Paris, France
OPEC Fund	The OPEC Fund for International Development, Vienna, Austria
SFD	Saudi Fund for Development, Riyadh, Saudi Arabia
UN	United Nations, New York, USA
UNDP	United Nations Development Programme, New York, USA
UNIDO	United Nations Industrial Development Organisation, Vienna, Austria
WB	The World Bank, Washington D.C., USA
	- IBRD International Bank for Reconstruction and Development
	- IDA International Development Association
WHO	World Health Organisation, Geneva, Switzerland

COMPANY DATA

Address	KOCKS CONSULT GMBH Stegemannstraße 32 - 38 56068 Koblenz, Germany	KOCKS CONSULT GMBH P.O. Box 10 60 56010 Koblenz, Germany
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Management	Mr. Jürgen KOCKS, Dipl.-Kfm. (M.BA) Mr. Klaus BETZINGER, Dipl.-Ing. (M.Sc.) Mr. Ulrich SPRICK, Dipl.-Ing. (M.Sc.) Mr. Michael LEINHOS, Dipl.-Ing. (M.Sc.) (see "Management Staff")
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Business residences	Head Office: Koblenz Branch Offices: Bonn, Frankfurt Other Offices: see "Branches and Offices"
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Shareholdings	kocks-rebo, IGUT, IMC, ITP, LUXPLAN, VIC, UTS (see "Affiliated Companies")
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Activities	Transportation and Traffic Engineering, Water and Waste Management, Structural Engineering, Environmental Engineering, Planning, Consultancy, Management
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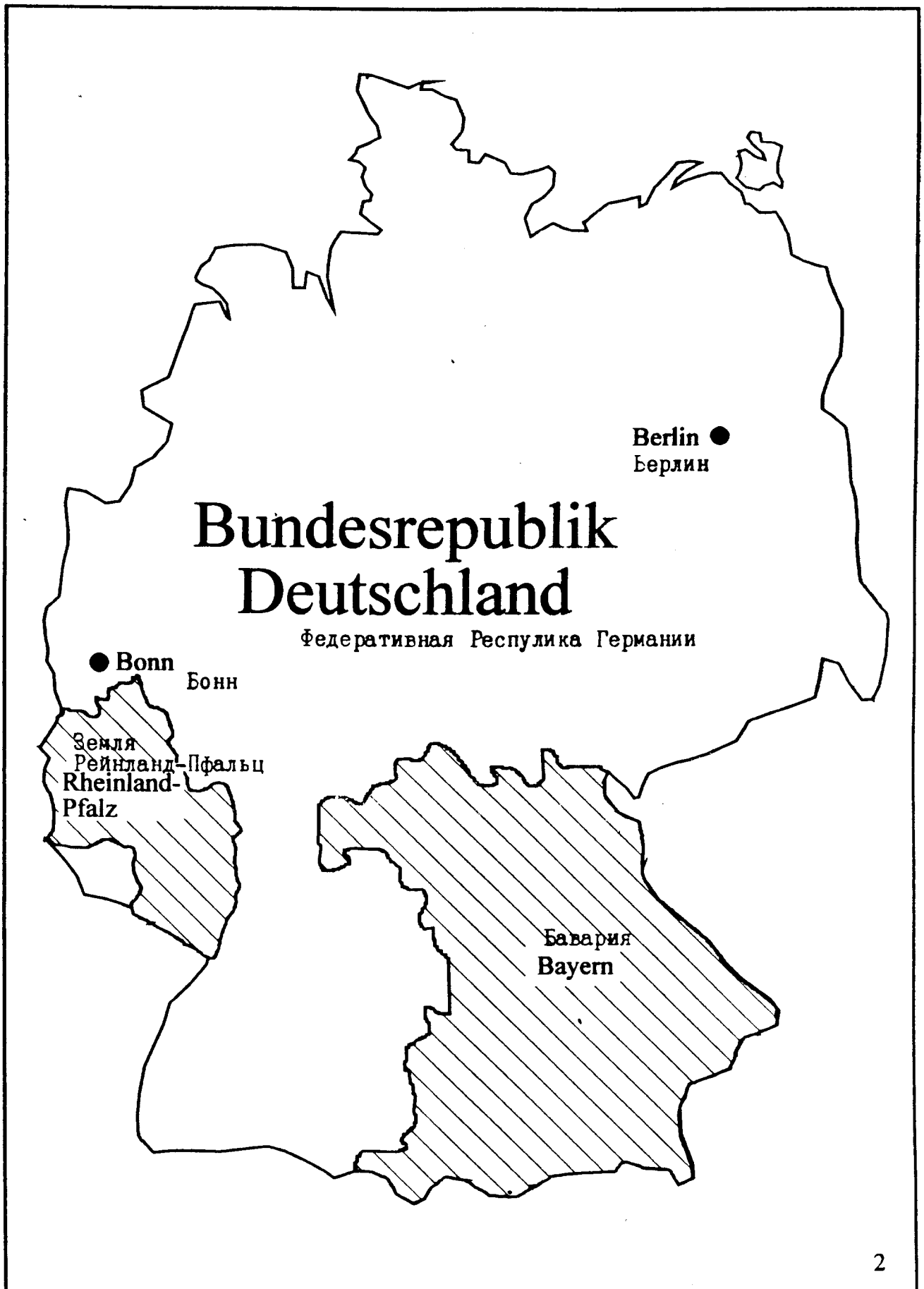
Staff	Transportation and Traffic Engineering	95
	Hydrological and Water Management Engineering	60
	Structural Engineering, Industrial Engineering	65
	Environmental Engineering and Waste Management	85
	Management Consultants	13
	Instructors	11
	Freelance Experts	<u>31</u>
	KOCKS in Total	360
	Affiliated Companies	<u>300</u>
	Total Staff Capacity	660

Memberships	VUBI - Association of Independent Consulting Engineering Firms VSVI - Association of Road Construction and Traffic Engineers Chamber of Consulting Engineers in Rhineland-Palatinate
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APPENDIX A 2

Organisational Structure of

- road administration
- motorway maintenance unit
- road maintenance unit



Berlin ●
Берлин

Bundesrepublik Deutschland

Федеративная Республика Германии

● Bonn
Бонн

Земля
Рейнланд-Пфальц
Rheinland-
Pfalz

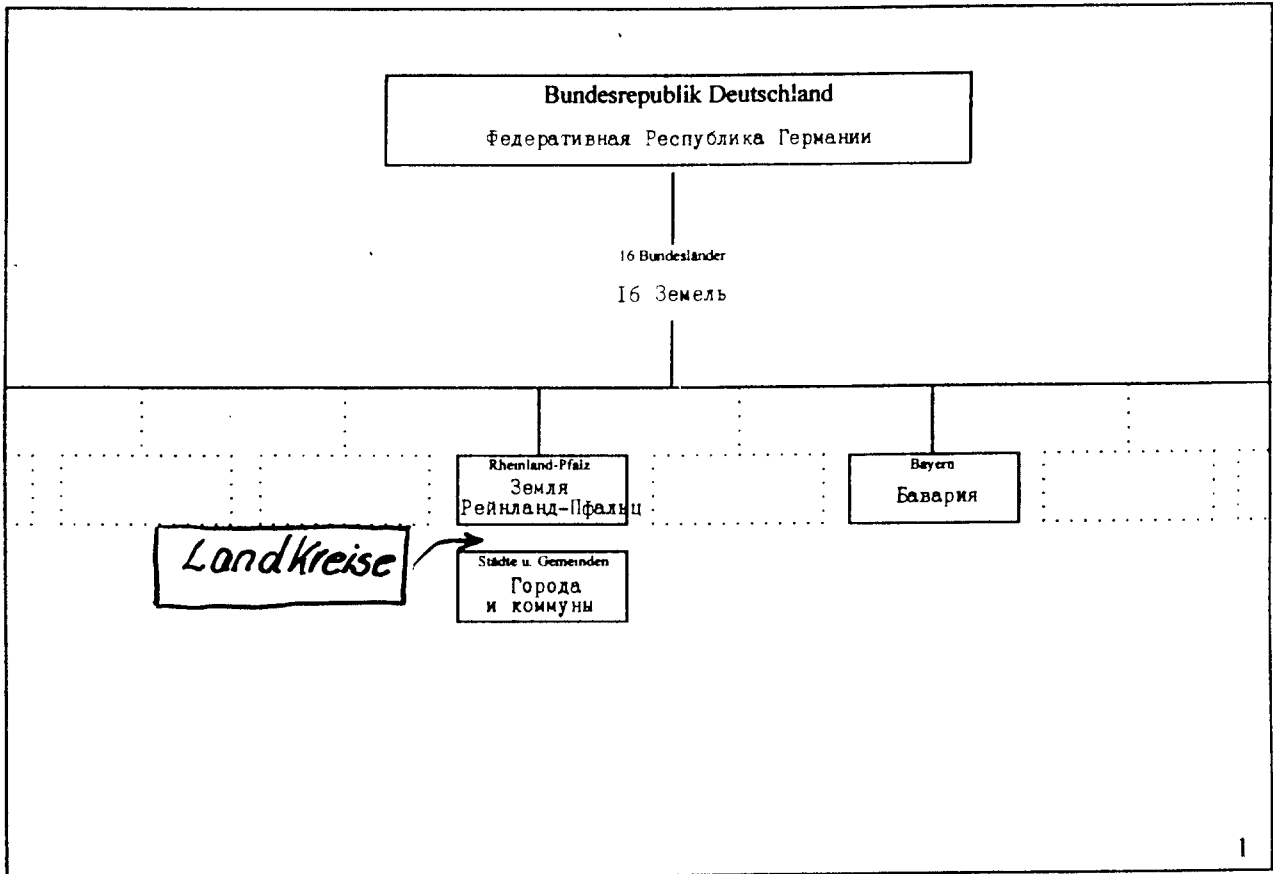
Бавария
Bayern

Bundesrepublik Deutschland (16 Bundesländer)

- Fläche: rd. 357.000 km²
- Einwohner: rd. 80 Millionen
- Bevölkerungsdichte: ca. 220 Einwohner je km²
- Straßennetz der 11 alten Bundesländer:
 - Bundesautobahnen 9.000 km
 - Bundesstraßen 31.900 km
 - Landesstraßen 63.100 km
 - Kreisstraßen 71.000 km
 - ca. 175.000 km

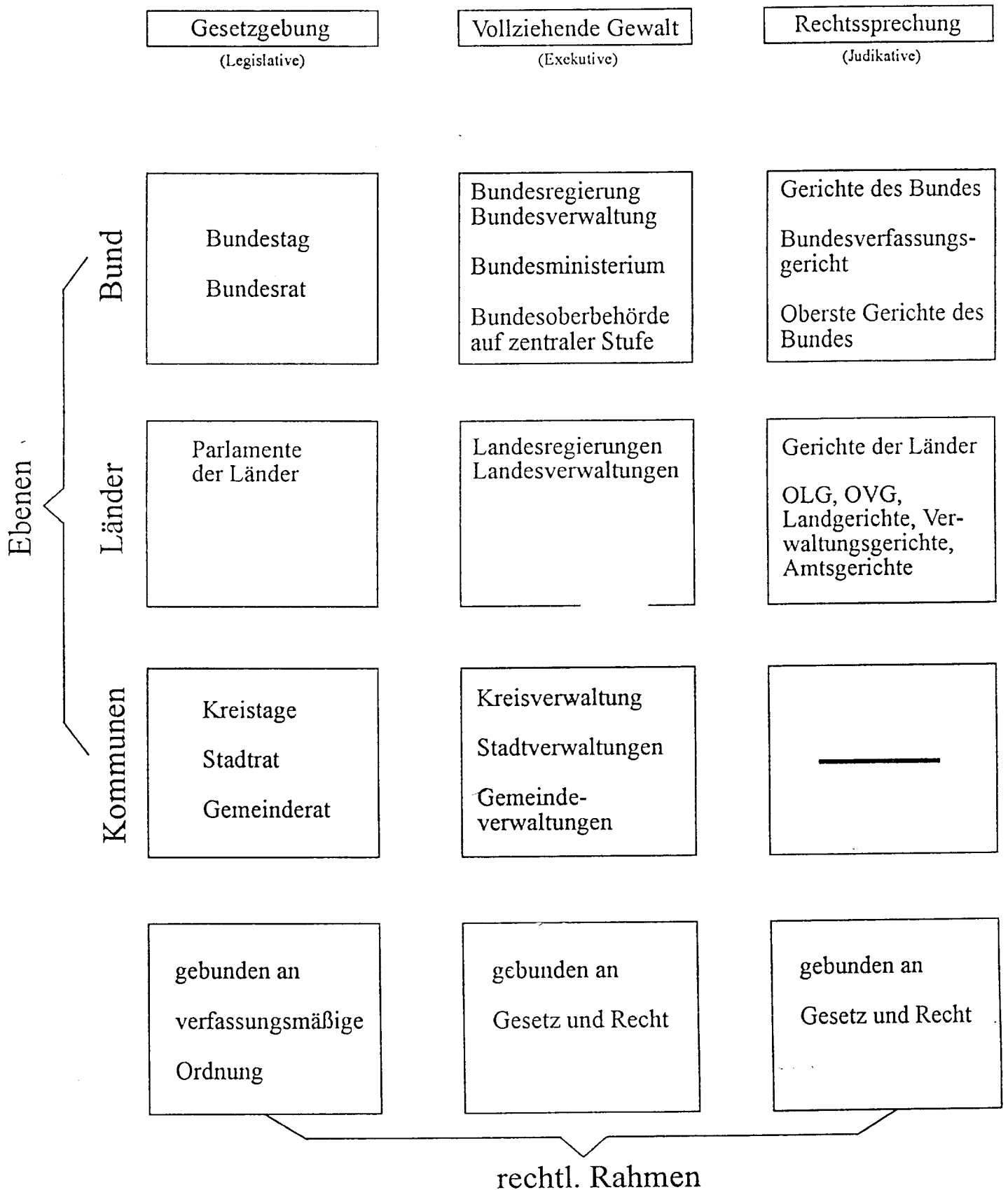
- Stadtstraßen, Gemeinde-
straßen + Bezirksstraßen 318.000 km
- insgesamt: 493.000 km

- Verkehrsentwicklung (alte Bundesländer):
 - Kraftwagen 32,5 Mio.
 - Pkw/Kombi 30,2 Mio.
 - Motorisierung ca. 525 Kraftwagen/1.000 Einwohner
ca. 490 Pkw/Kombi/1.000 Einwohner

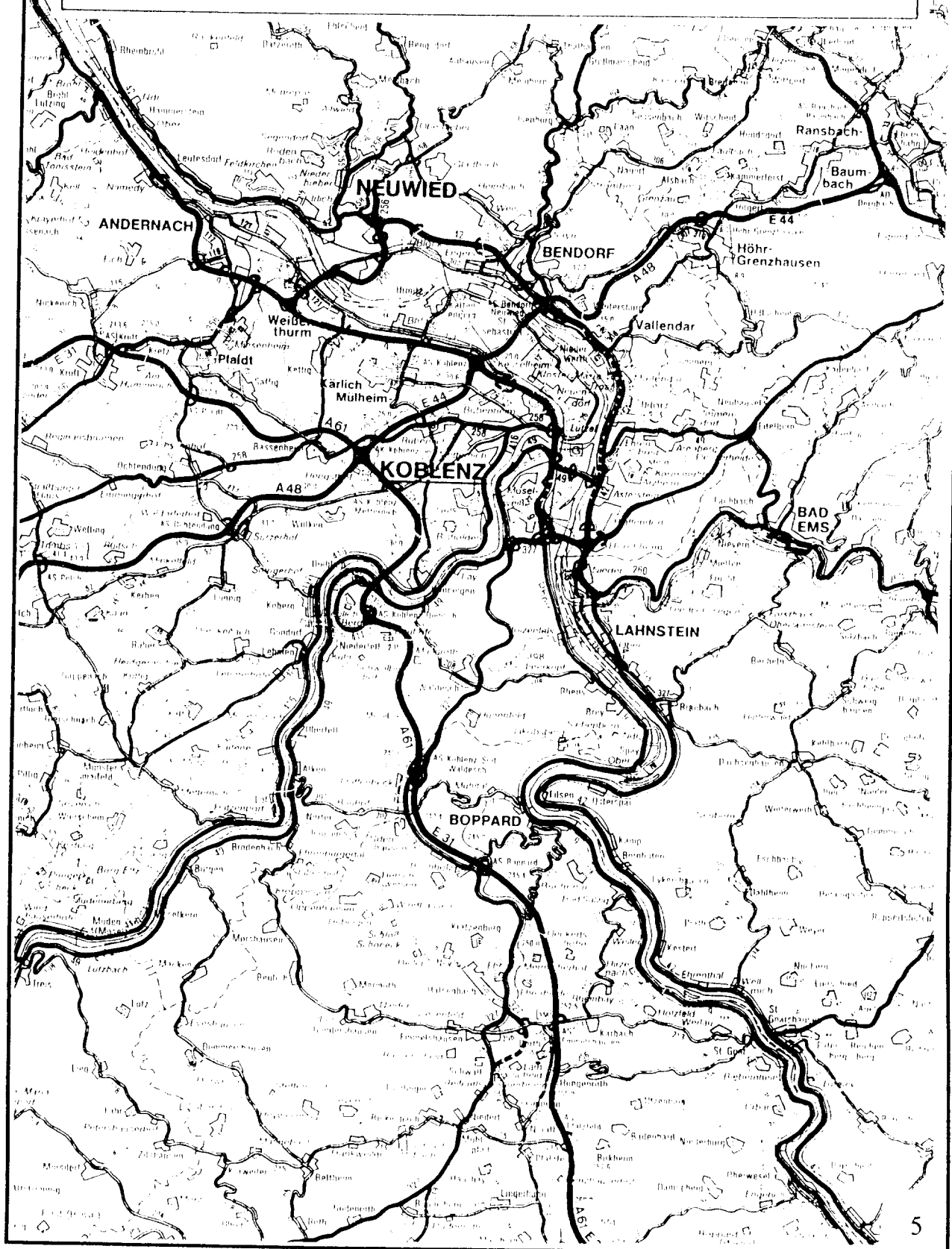


Staatsaufbau der BRD

Säulen



Straßenkarte Rheinland-Pfalz (Ausschnitt)
Карта дорог Земли Рейнланд Пфалз (вырезка)



Rheinland-Pfalz

- Fläche: rd. 20.000 km²
- Einwohner: rd. 3,7 Mio.
- Bevölkerungsdichte: ca. 185 Einwohner je km²
- Straßennetz:

<u>Bundesautobahnen</u>	800 km
<u>Bundesstraßen</u>	3.100 km
<u>Landesstraßen</u>	7.100 km
Kreisstraßen	<u>7.350 km</u>
	insgesamt: <u>18.350 km</u>

- Verkehrsentwicklung :

Kraftwagen	2,20 Mio.
Pkw/Kombi	1,90 Mio.
Motorisierung	ca. 595 Kraftwagen/1.000 Einwohner
	ca. 510 Pkw/Kombi/1.000 Einwohner

МИНИСТР ТРАНСПОРТА

ВЕРХОВНЫЙ

Bundesminister für Verkehr

Oberste
Bundesbehörde

ФЕДЕРАЛЬНЫЙ
ОРГАН ВЛАСТИ

Abteilung
Straßenverkehr

Abt. Binnenschiff-
fahrt u. Wasserstr.

Abteilung
Straßenbau

ОТДЕЛ ДОР
ОЖНОГО ТРА
НСПОРТА

ОТДЕЛ
НИХ ВО
РОГ И

ВНУТРЕН-
НЫХ ДО-
СУДОХОД-
СТВА

ОТДЕЛ
ДОР
ОЖНОГО
СТРОИТ-ВА

Федеральное
Кraftfahrt-
Управление
Bundesamt
по транспорту

ВЕРХНИЙ
Obere
Bundesbehörde
ФЕДЕРАЛЬНЫЙ
ОРГАН ВЛАСТИ

Дирекция водного
Wasser- und Schiffahrts-
direktion
пароходства

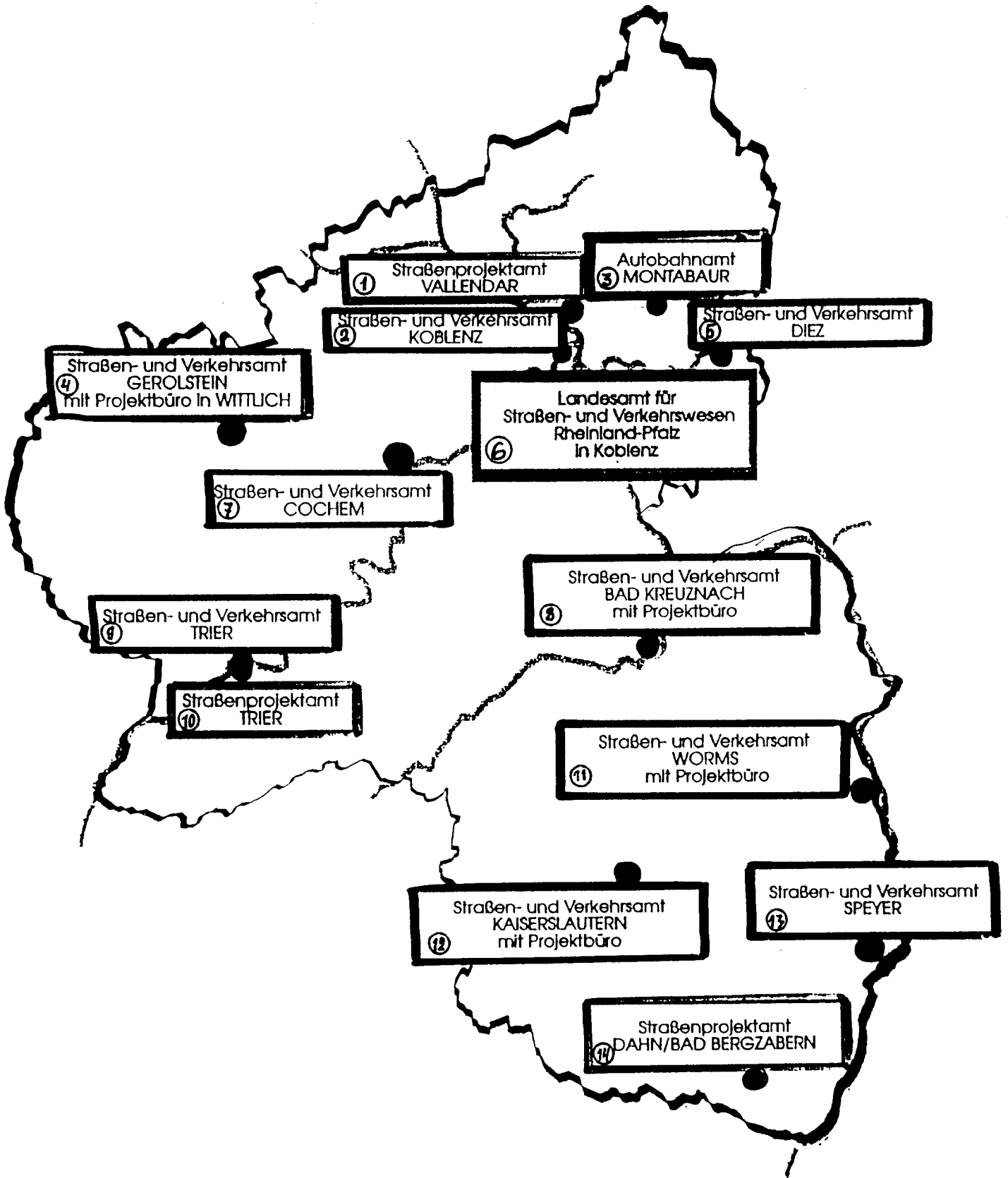
СРЕДНИЙ
Mittlere
Bundesbehörde
ФЕДЕРАЛЬНЫЙ
ОРГАН ВЛАСТИ

Управление водного
Wasser- und Schiffahrts-
ämter
пароходства

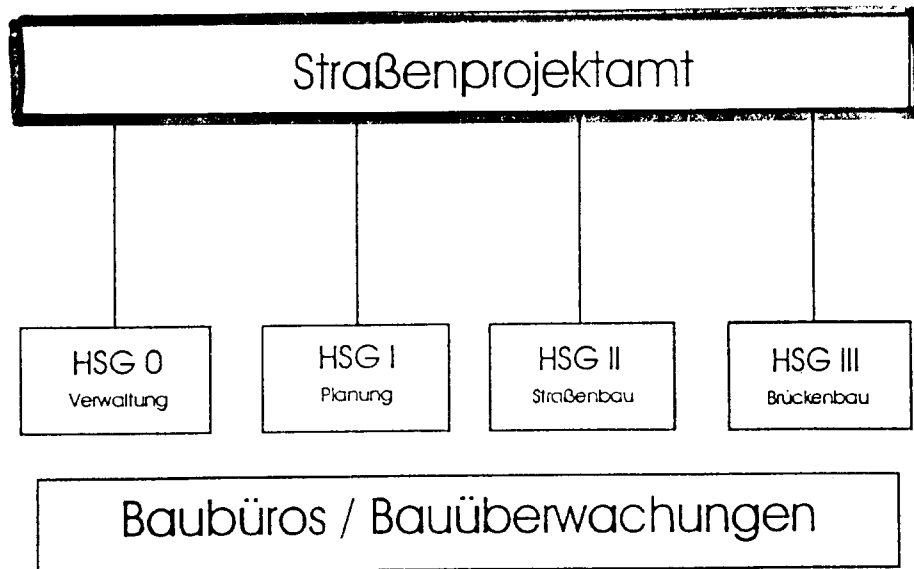
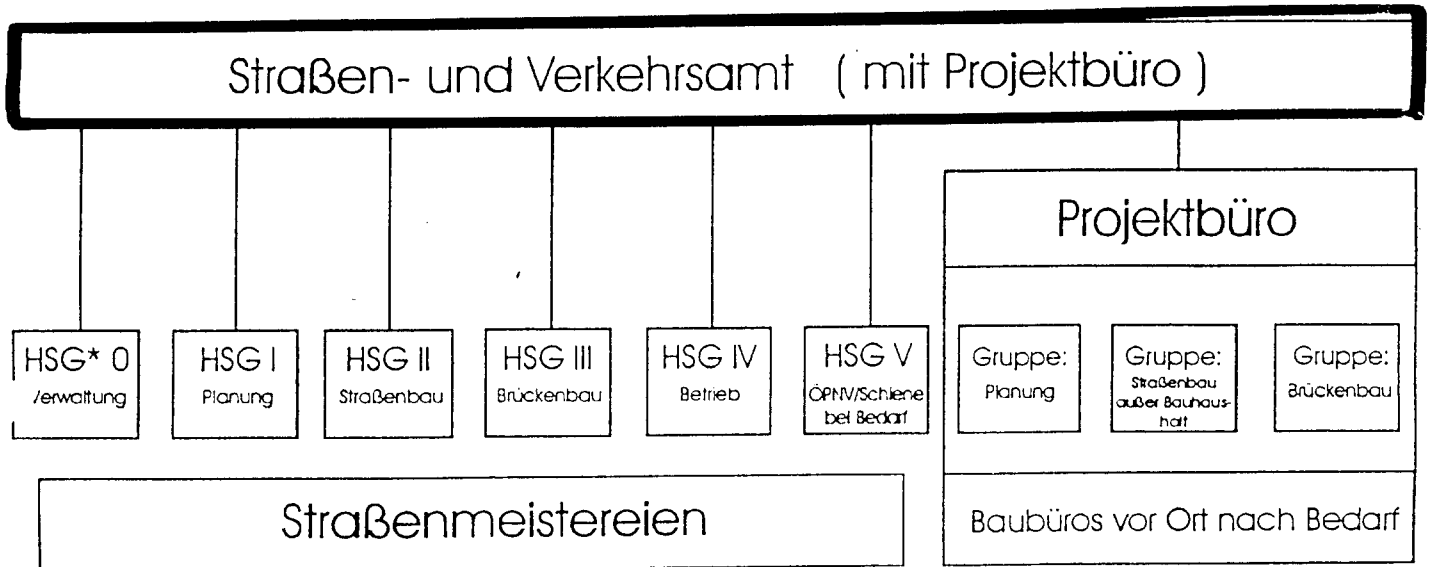
НИЖШИЙ
Untere
Bundesbehörde
ФЕДЕРАЛЬНЫЙ
ОРГАН ВЛАСТИ

Landesamt für Straßen- und Verkehrswesen Rheinland - Pfalz mit Ämtern

УПРАВЛЕНИЯ ПО ДОРОГАМ И ТРАНСПОРТУ
ЗЕМЛИ РАЙНЛАНД - РФАЛЬЦ



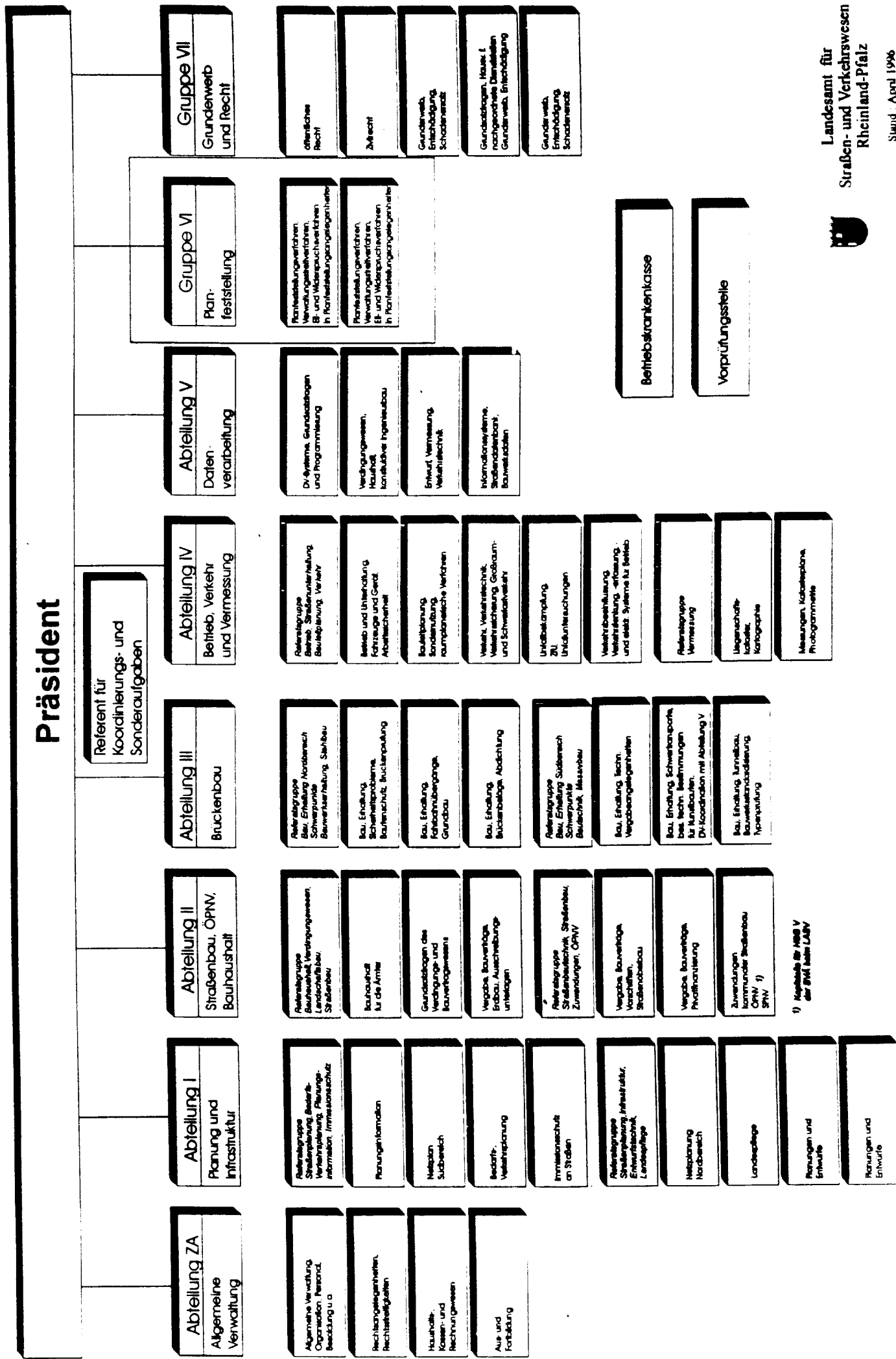
Organisationsplan eines Straßen- und Verkehrsamtes / Straßenprojektamtes im Bereich des Landesamtes für Straßen- und Verkehrswesen Rheinland-Pfalz



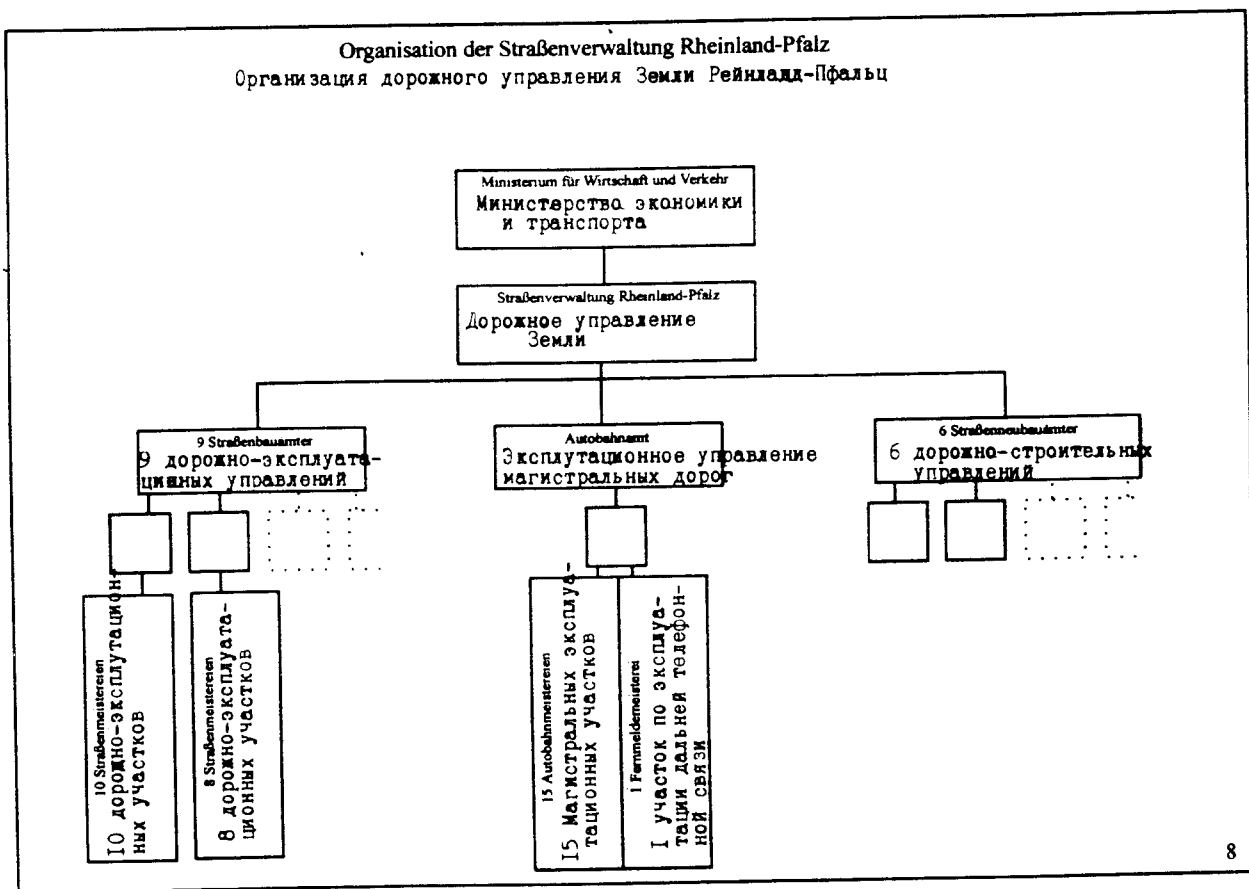
*HSG: Hauptsachgebiet



Organisationsplan des Landesamtes für Straßen- und Verkehrswesen Rheinland-Pfalz

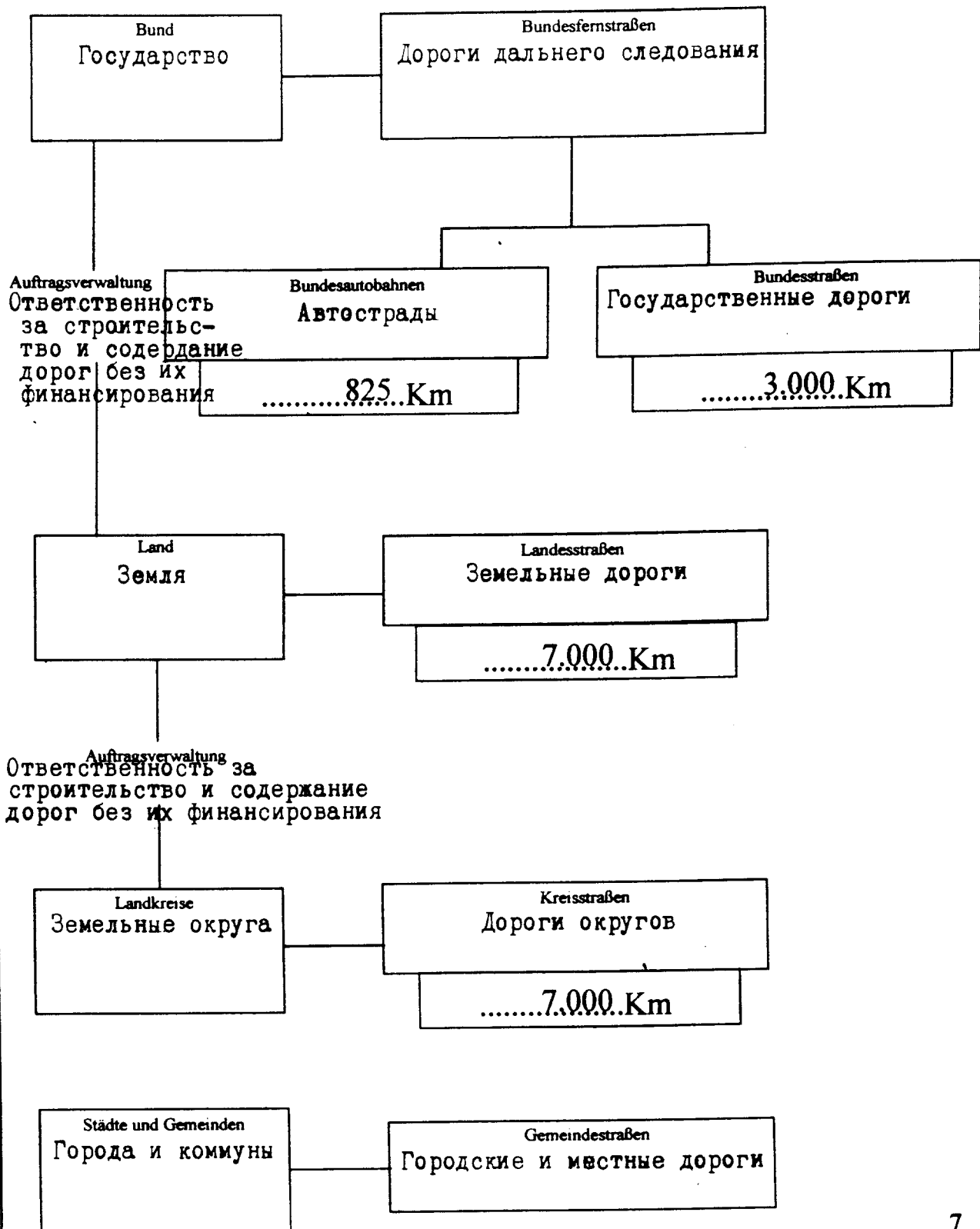


Organisation der Straßenverwaltung Rheinland-Pfalz
 Организация дорожного управления Земли Рейнланд-Пфальц



Straßenklassifizierung und Straßenbaulast

Классификация дорог и ответственность за строительство и содержание



Autobahnamt
Эксплуатационное
управление магистраль-
ных дорог

Автостралы
Bundesautobahnen

Проходящий участок
Durchgehende Strecke 825 Km

Verbindungsrampen 450 Km
Соединительные разъезды, развилки, подьезды

15 Autobahnmeistereien
15 магистральных
эксплуатационных участков

Проходящий участок
Durchgehende Strecke 55 Km

Verbindungsrampen 30 Km
Соединительные разъезды, развилки, подьезды

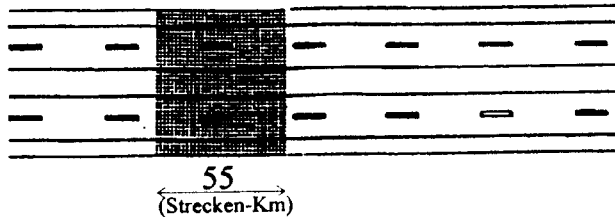
1 Fernmeldemeisterei
Участок по эксплуатации
дальней телефонной связи

Общая сеть автострал земли Рейнланд-Пфальц
Gesamtes Autobahnnetz in Rheinland-Pfalz

Autobahnmeisterei : Personal-, Fahrzeug-und Geräteausstattung

Магистральный эксплуатационный участок: оснащение техникой, оборудованием, персоналом

Обслуживаемый участок
Zu betreuende Strecke:
Участок с коммутатором для
AM mit Notrufvermittlung **ВЫЗОВА СПЕЦСЛУЖБ**



Personal: Штат:

Bauingenieur Verwaltungsangestellter+ Techniker	Telefonisten	Straßenwärter und Mechaniker
Служащие	Телефонисты	Дорожные рабочие, мастера, механики

Anzahl: 3 + 4 + 32
К-во:

AM ohne Notrufvermittlung Участок без коммутатора

Personal: Штат:

Bauingenieur, Verwaltungsangestellter, Techniker	Straßenwärter und Mechaniker
Служащие	Дорожные рабочие, мастера, механики

Anzahl: 3 + 32
К-во:

Автомобили
Fahrzeuge:

К-во
Anzahl:

6	4	1	1

Разбрасыватели
Streuautomaten

К-во
Anzahl:

7			2
7			2

Снежные
плуги
Schneepflüge

К-во
Anzahl:

Автомобили
Fahrzeuge

К-во
Anzahl:



6



4



1



1

Автомобили
частных
Unternehmerfahrzeuge
предприятий

К-во
Anzahl:



1

Снежные
фрезы
Schneefräsen
Schneesleudern
Роторные сне-
гоочистители

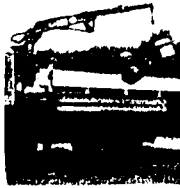
Анzahl: К-во



1

Автокран
Ladekran

К-во
Anzahl:



1

Телескопическая
косилка
Auslegermähergerät

К-во
Anzahl:



1

Косилка для
обкашивания
обочин дорог
Randstreifenmähergerät

К-во
Anzahl:



1

Машина для
мойки столбиков
Leitpfostenwaschgerät

К-во
Anzahl:



1

Автомобили

Fahrzeuge:

К-во
Anzahl:



6



4





1



1

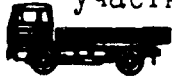
Навесная под-
метальная маш-
на
Vorbauehrmaschine

К-во
Anzahl:

			
			1
Измельчитель сучков, веток Buschholzhackmaschine			
К-во: Anzahl:			1

Personalbestand Autobahnmeisterei
(Bemessungsgrundlage: Winterdienst-Einsatz)
Персонал магистрального эксплуатационного участка
(из расчета на зимний период эксплуатации)

Автомобили
участка



Eigene LKW's

Мотоблоки



Motorgeräte-
träger

Двор



Gehöft

Больные



Krank



24

+

2

+

2

+

4 = 32

Straßenbauamt

Дорожно-эксплуатационное управление

Государственные дороги: 400 Km
Bundesstraßen:
Средняя протяженность дорожной Сети

Дороги земельного значения: 800 Km
Landesstraßen:

Городские и местные дороги: 800 Km
Kreisstraßen:

Mittlere Netzlänge: 2000 Km
Средняя протяженность дорог:

9 Straßenmeistereien

9 дорожно-эксплуатационных участков

Государственные дороги: 45 Km
Bundesstraßen:

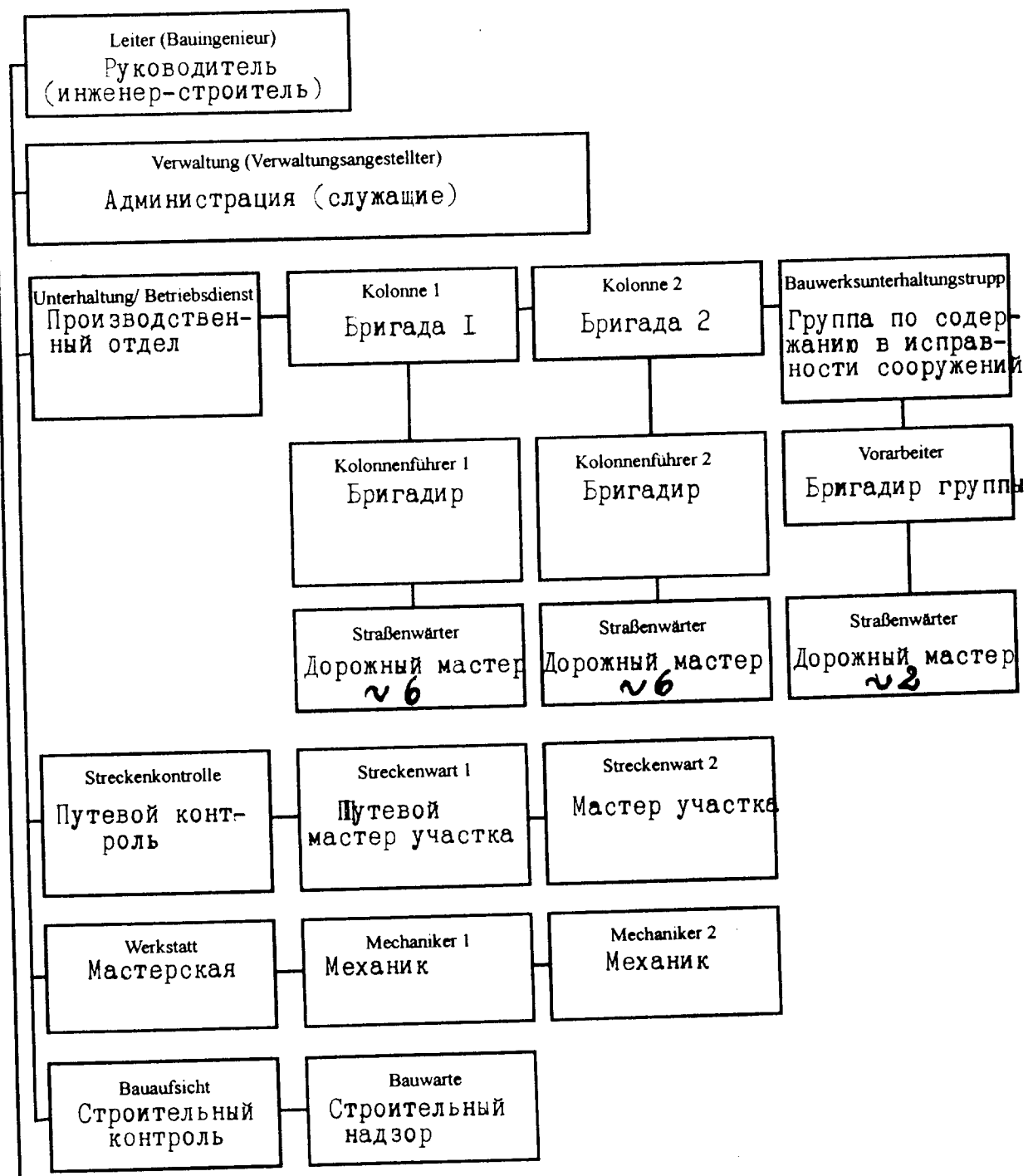
Дороги земельного значения: 90 Km
Landesstraßen:

Городские и окружные дороги: 90 Km
Kreisstraßen:

Mittlere Netzlänge: 225 Km
Средняя протяженность дорог:

Straßenmeisterei Organisation
 Организация эксплуатационного участка

(Д Э У)



Автомобили:
Fahrzeuge:

К-во:
Anzahl:



2



3



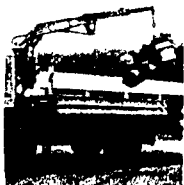
2



2

Автокран:
Ladekran

К-во:
Anzahl:



1

Телескопическая косилка
Auslegemähgerät

К-во:
Anzahl:



1

Ковилка для
обкашивания
дорог
Randstreifenmähgerät

К-во:
Anzahl:



1

Машина для мойки
столбиков
Leitpfostenwaschgerät

К-во:
Anzahl:



1

Навесная подметальная машина
Vorbauehrmaschine

К-во:
Anzahl:



1

Измельчитель веток и сучков
Buschholzhackmaschine

К-во:
Anzahl:



1

**Personalbestand Straßenmeisterei
(Bemessungsgrundlage: Winterdienst-Einsatz)**

Персонал дорожно-эксплуатационного участка
(из расчета на зимний период эксплуатации)

Автомобили
принадлежащие
участку



Eigene LKW's

Автомобили
частных пред-
приятий



Unternehmer LKW's

Мото-
бло-
ки



Motorgeräte-
träger

Автомобиль
мастера
участка



Streckenwart-
fahrzeug

Двор



Gehöft

Больные



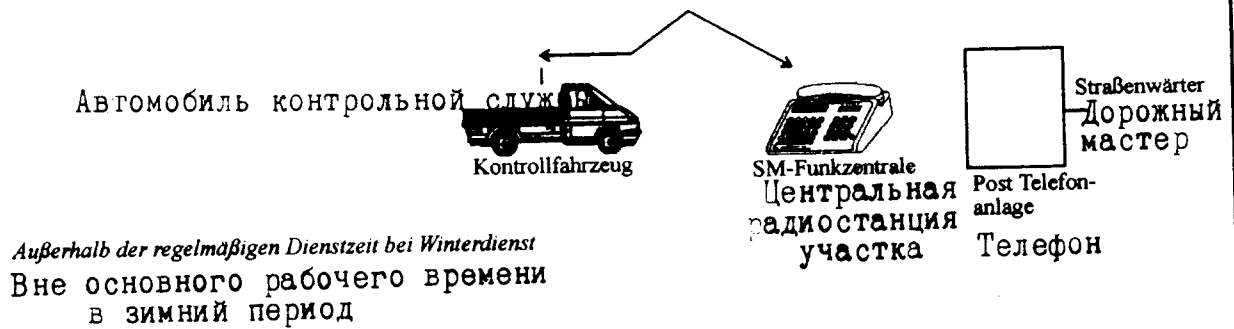
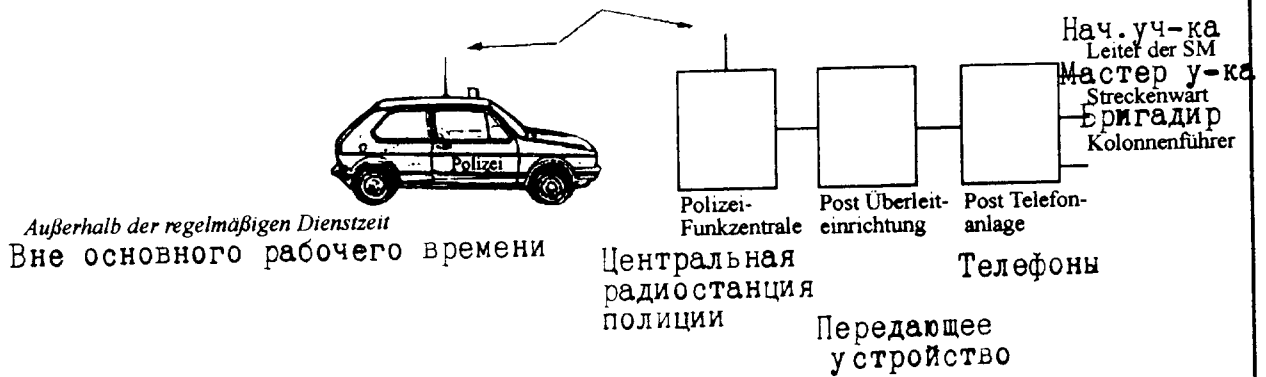
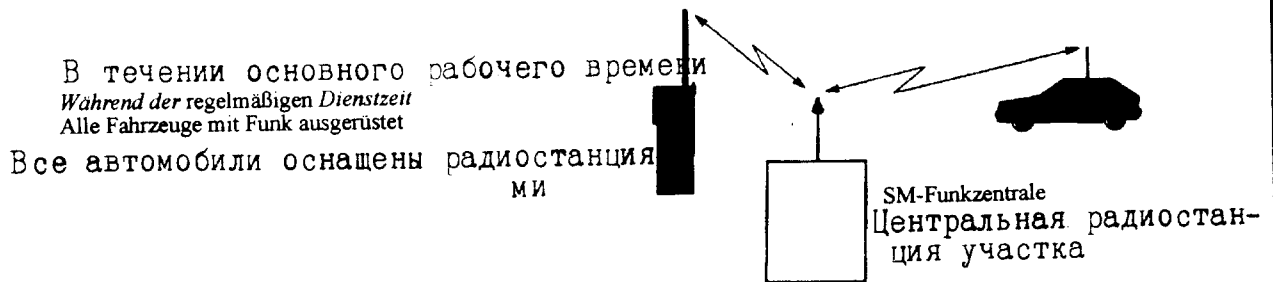
Krank



$$8 + 5 + 4 + 1 + 2 + 4 = 24$$

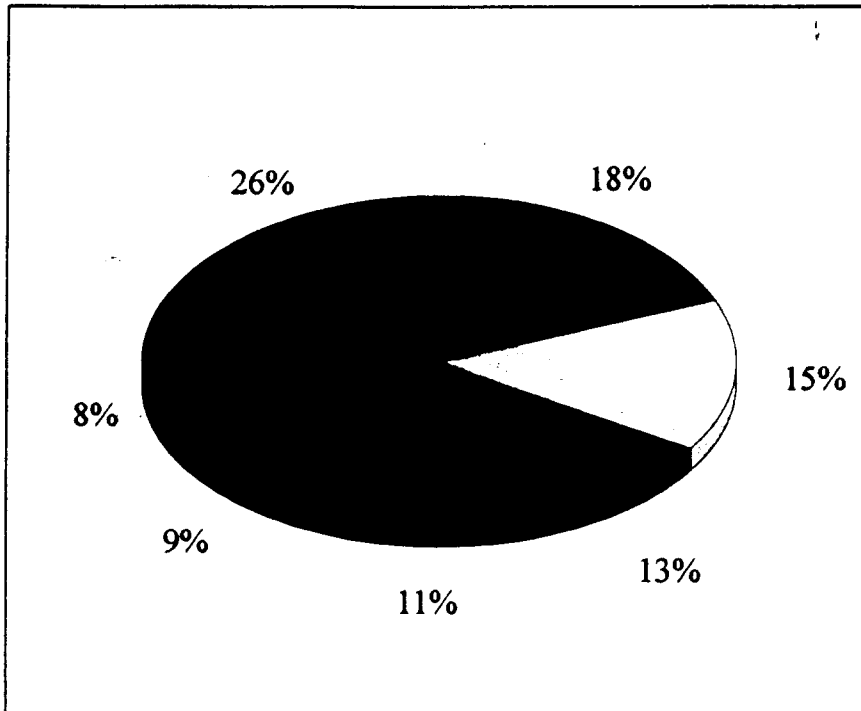
Kommunikation Straßenmeisterei

Средства связи дорожно-эксплуатационного участка



Tätigkeiten des Straßenunterhaltungspersonals

Разделение деятельности дорожно-эксплуатационного персонала по видам работ



Содержание в исправности дорожных сооружений

1) 26% Bauliche Unterhaltung der Straßenanlagen

Работа в зимний период

2) 18% Winterdienst

Уход за зелеными насаждениями

3) 15% Grünpflege

Очистные работы

4) 13% Reinigung

Содержание технических дорожных сооружений

5) 9% Unterhaltung der verkehrstechnischen Anlagen

Ремонт и содержание техники, зданий

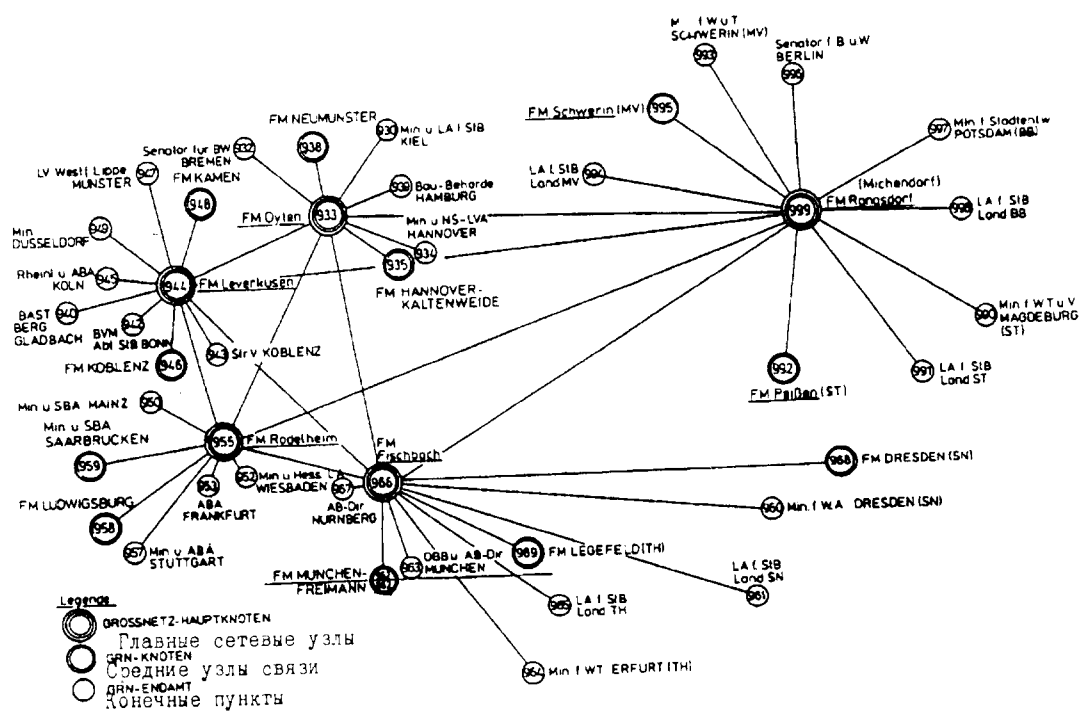
6) 8% Unterhaltung der Fahrzeuge und Gebäude

Прочие

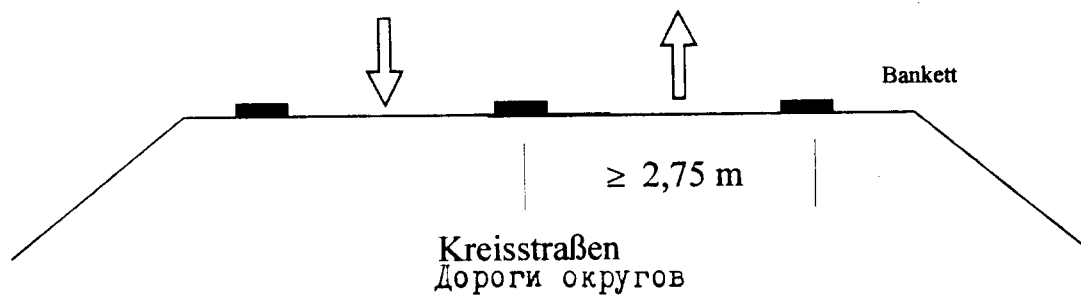
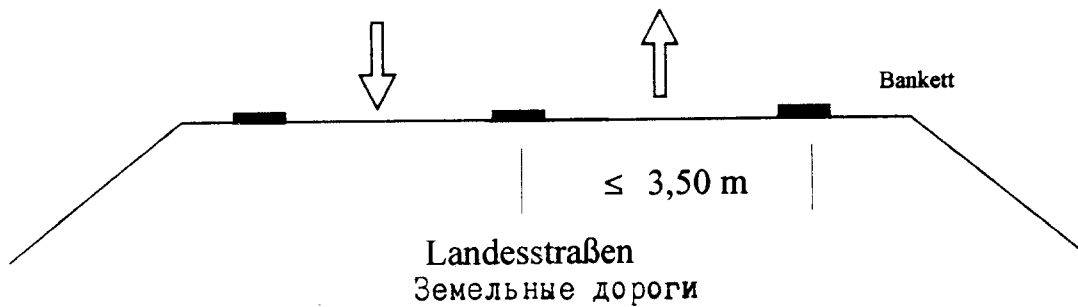
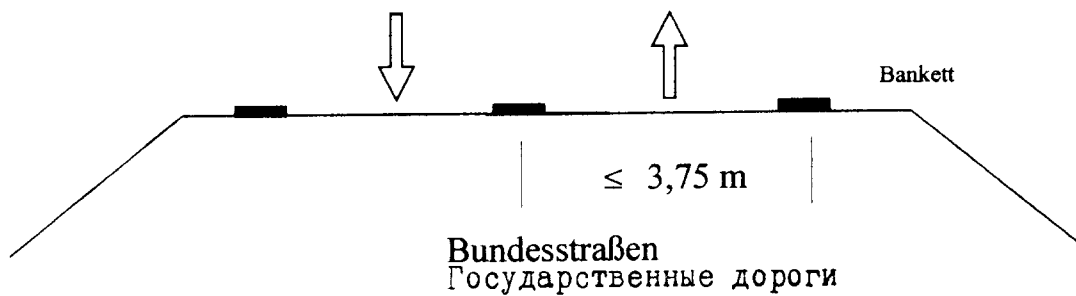
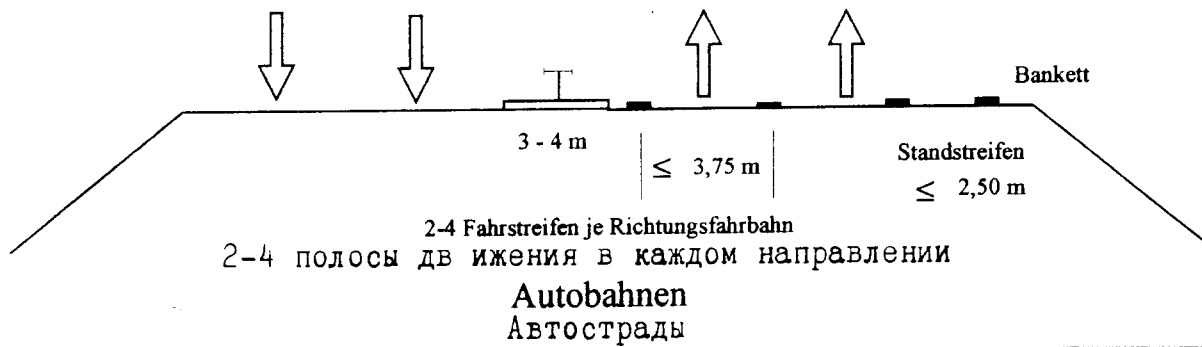
13% Sonstiges

Autobahnfernmeldenetz (Schema)

Схема дальней телефонной связи магистральной дорожи

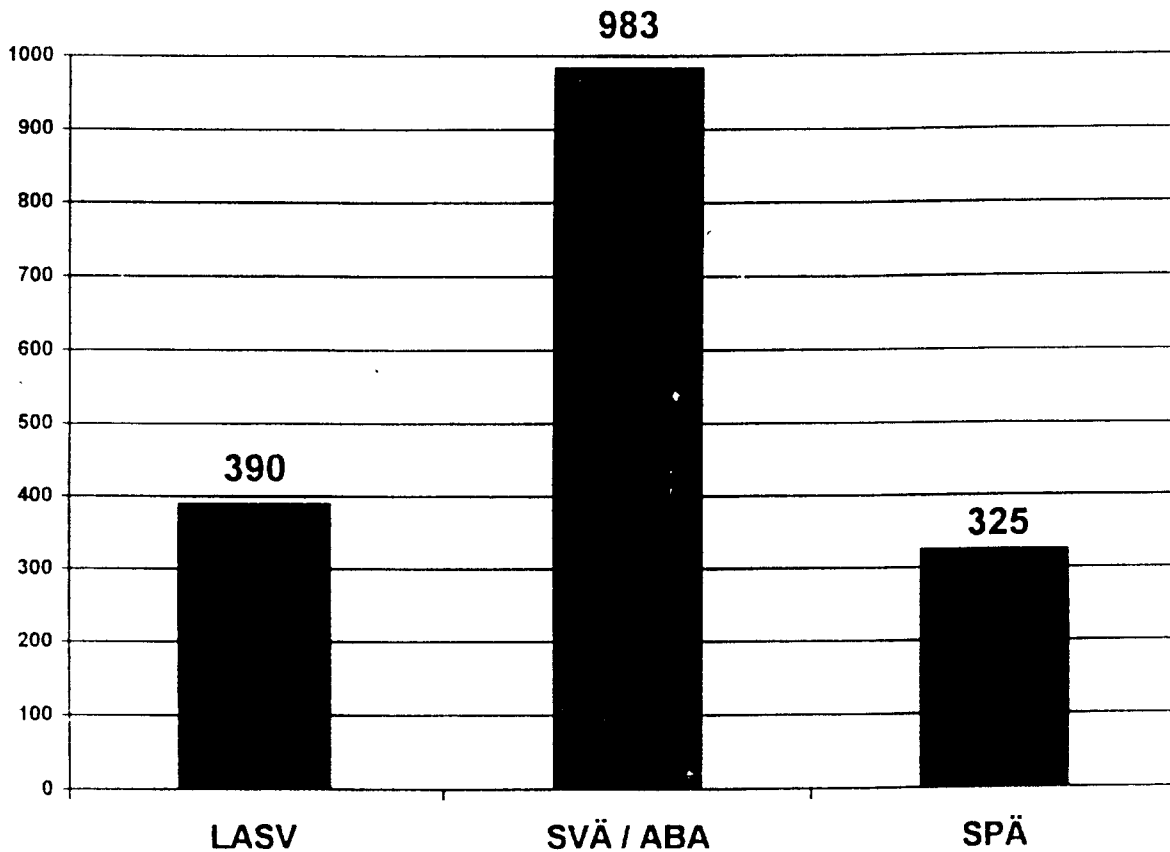


Regelquerschnitte
Типовые поперечные сечения дорог



Personalverteilung

(Innendienst)



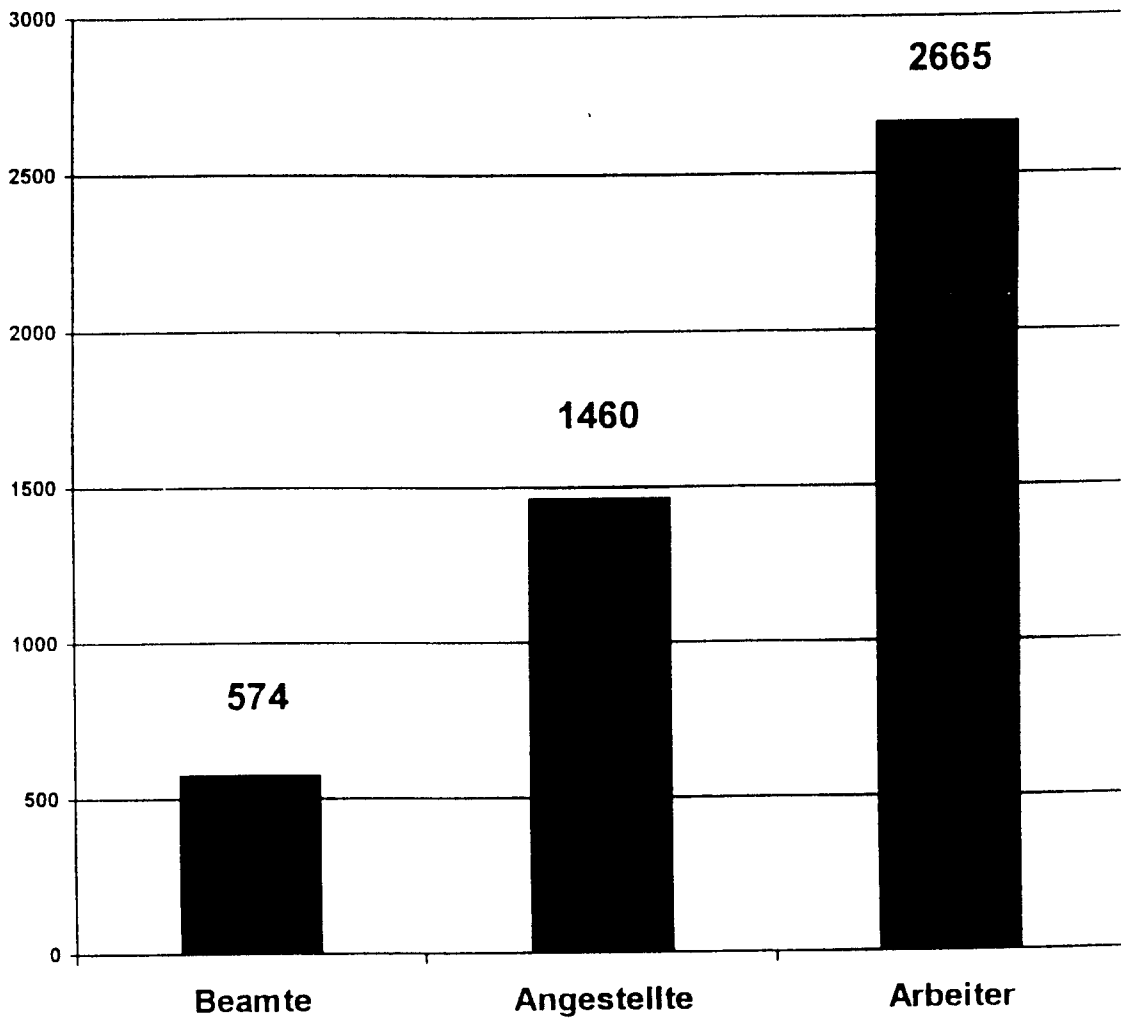
zuzüglich : 109 Reinemachefrauen

AM / SM gesamt: 2892

Stand: 30.09.1996

Personalstruktur

gesamt: 4.699

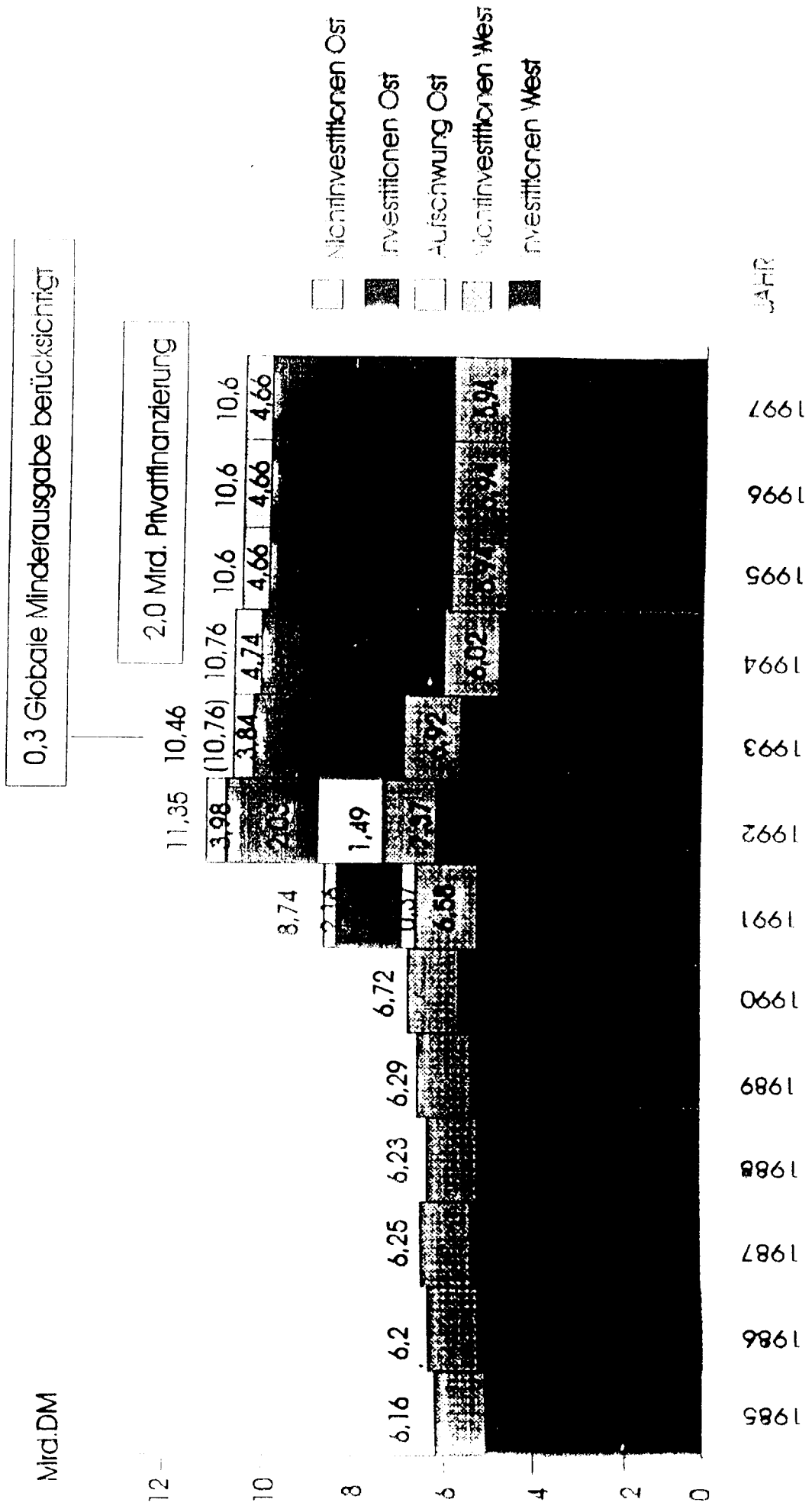


Betriebsdienst:
2441

Stand : 30.09.1996

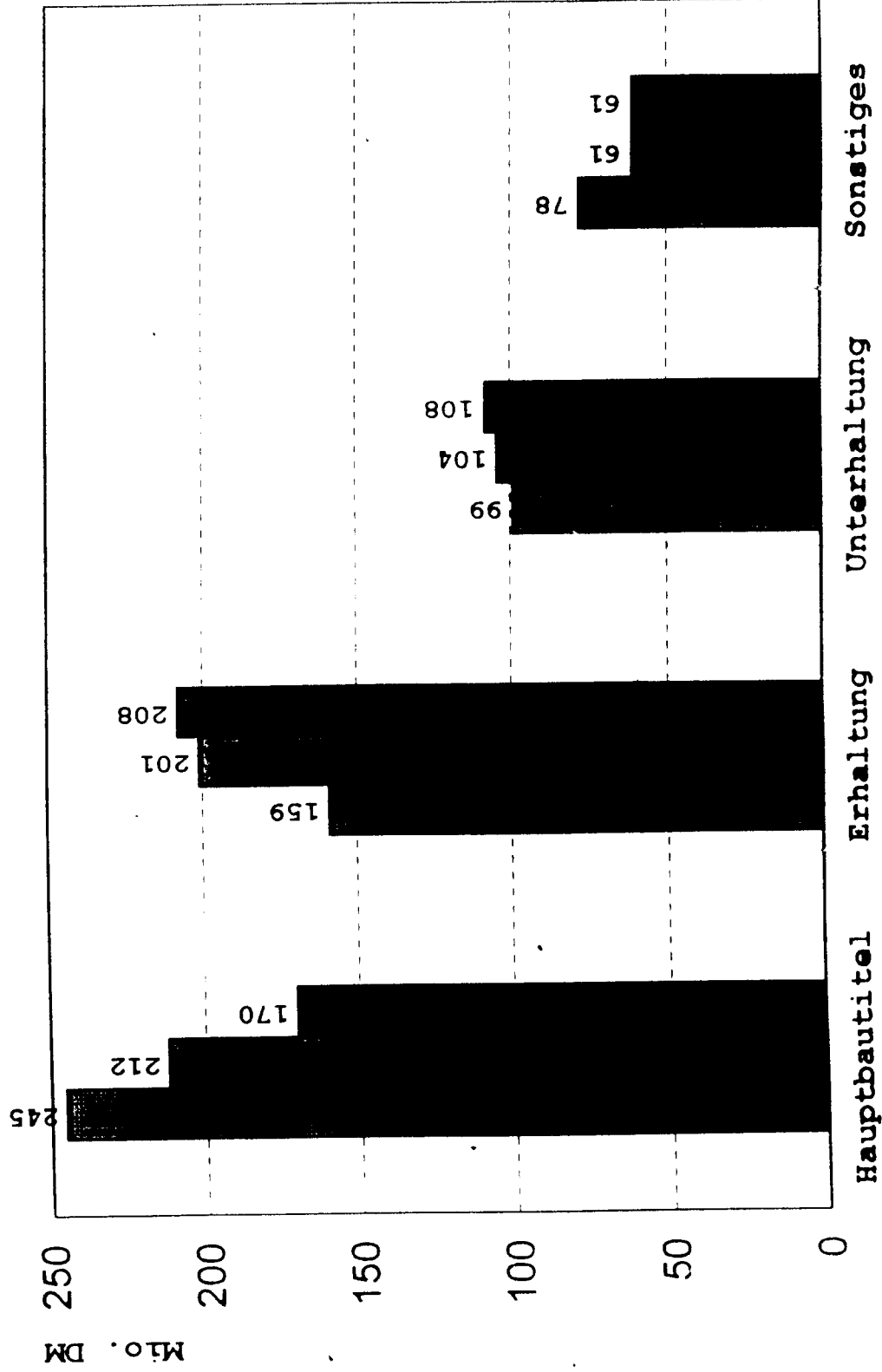
Entwicklung der Ausgaben für Bundesfernstraßen (3RD)

(ab 1993 Soll)



straßenbauvolumen im Bundeshaushalt 1993, 1994, 1995 (RLP)

Stand : Juli 1994



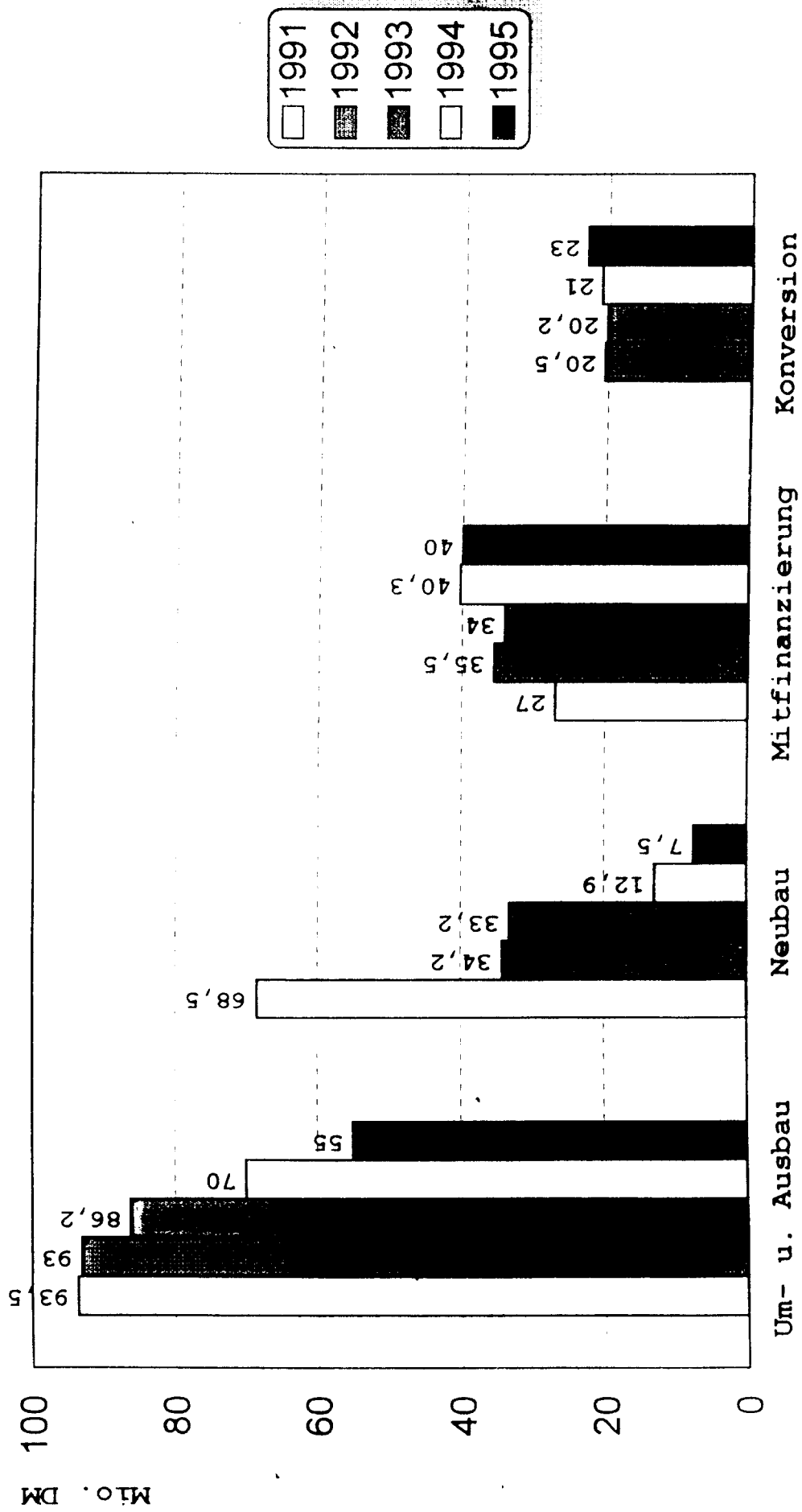
Stand: 10/95

Mio. DM

■	1993	581
■	1994	578
■	1995	547

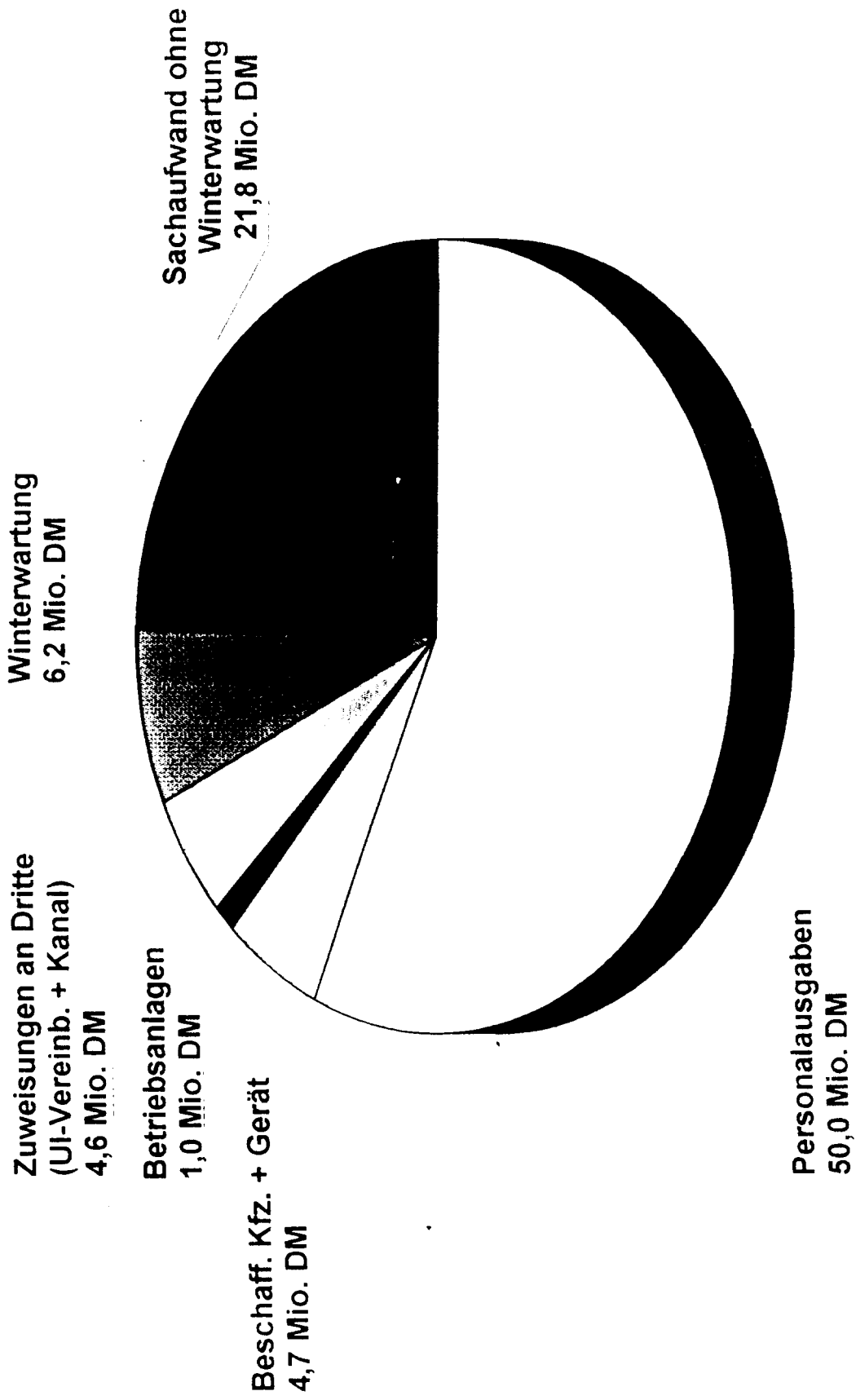
Straßenbauvolumen im Landeshaushalt 1994/1995

Stand : Juli 1994



Baukosten	Bundes- autobahn 4-spurig	Bundes- straße 4-spurig	Bundes- straße 2-spurig
UJ / km 1993	14 Mio DM	11 Mio DM	9 Mio DM
	44.150 DM/km	38.700 DM/km	19.200 DM/km

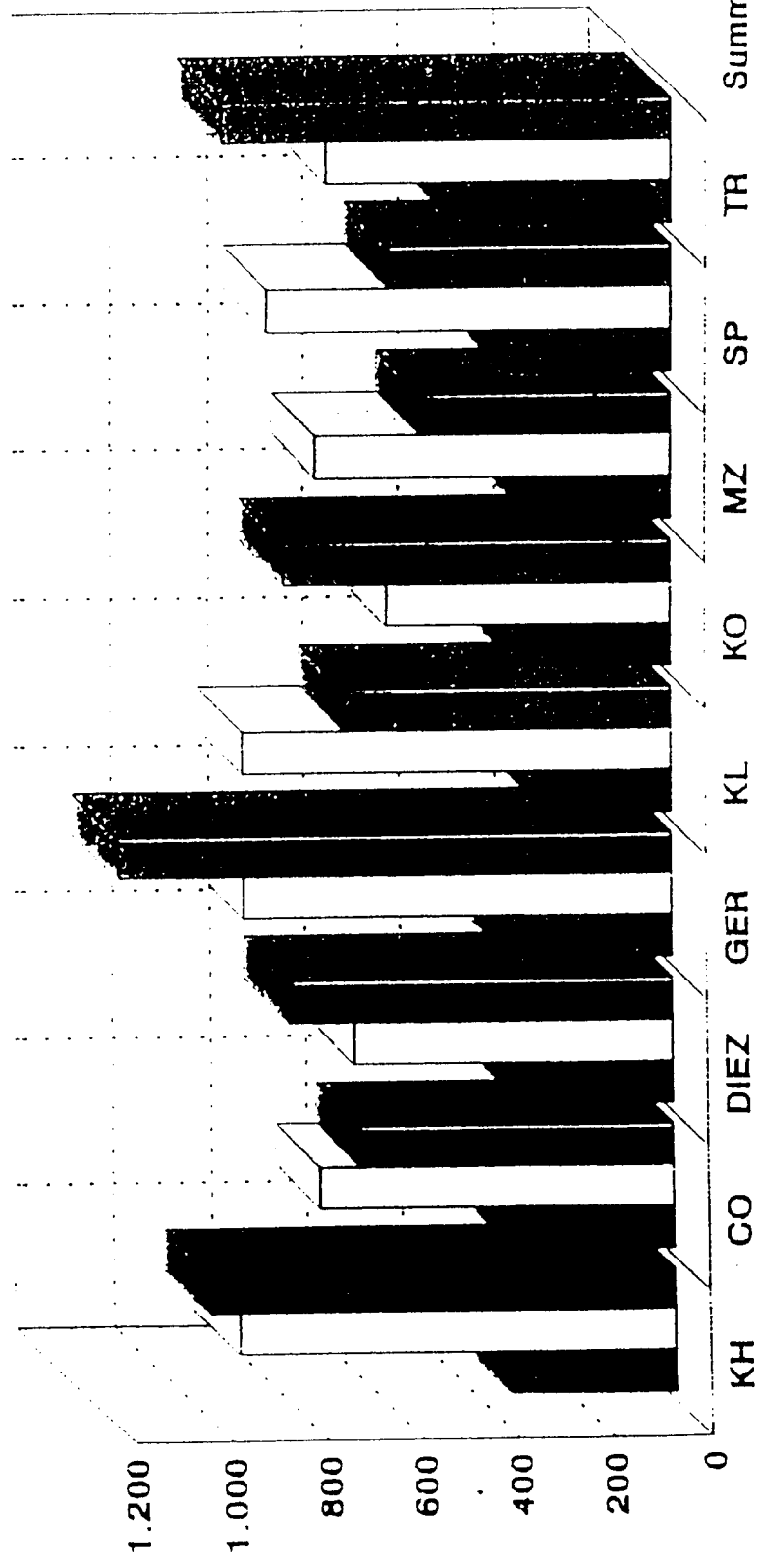
UI - Ausgabemittel Land 1994



АДМИНИСТРАЦИЯ ЗЕМЛИ РАЙНЛАНД - ПФАЛЬЦ - БАНК ДАННЫХ ПО ДОРОГАМ -
Straßenverwaltung Rheinland-Pfalz - Straßendatenbank -

Straßenlängenverzeichnis Stand 1.5.1993

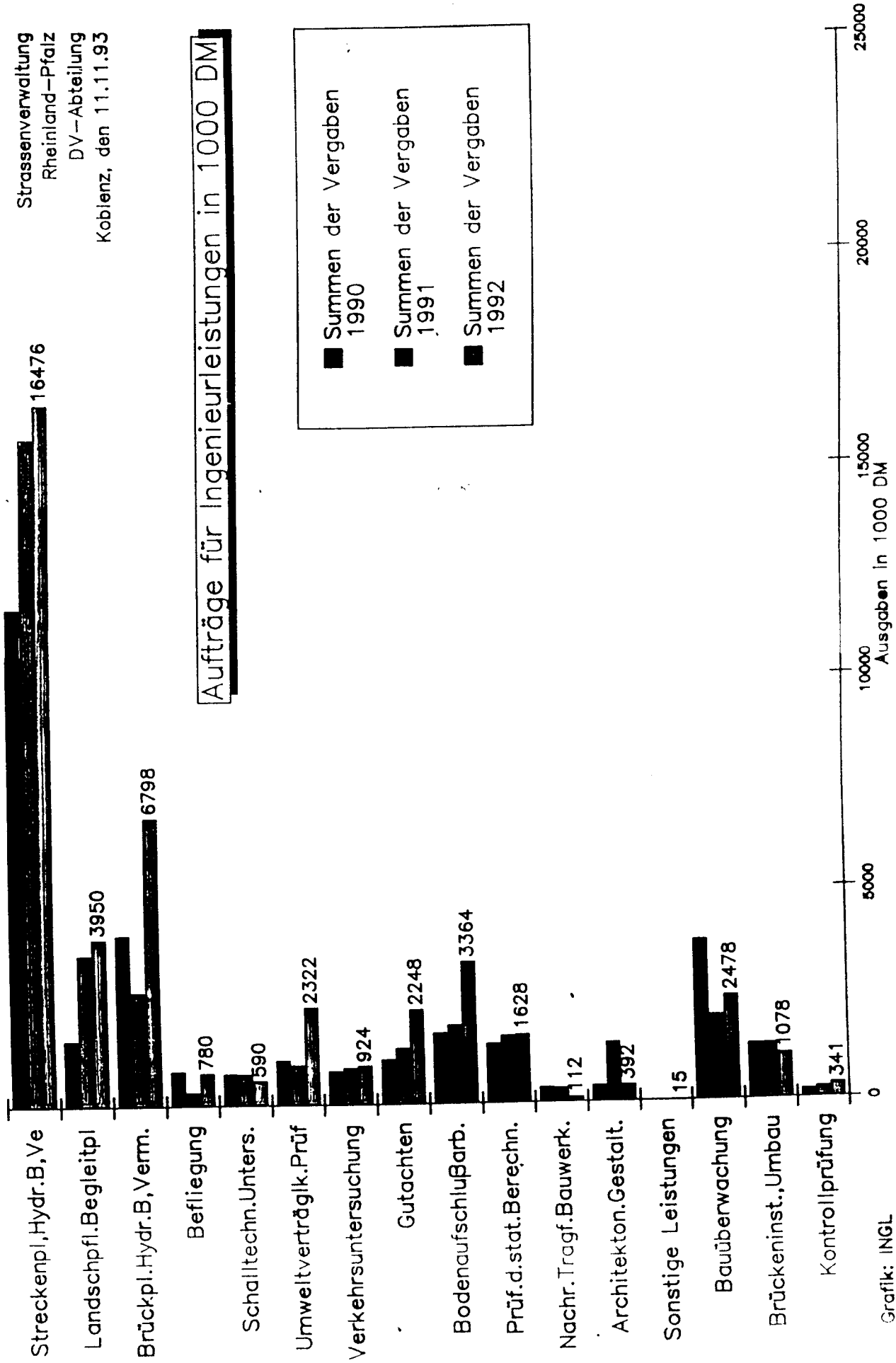
Summenzusammenstellung der B-, L-, und K-Straßen aller Ämter (ohne BFB)



Государственные
 дороги
 Земельные дороги
 Дороги округов
 СУММА

Die Straßenlängen beinhalten die Unterhaltungslängen des Straßenbauamtes, die Längen durch UJ/UA-Verträge sowie Längen in Bauleist Dritter, jedoch keine Längen in Gemeindebauleist.

Aufträge für Ingenieurleistungen in 1000 DM



Grafik: INGL

Der Fiskus und die Straßen

Bund, Länder
und Gemeinden
1989 in Mrd. DM

Einnahmen

9,2

Kfz-Steuer

28,6
Mrd. DM

Mineralöl-
steuer
(nur aus dem
Kraftverkehr)

4,0

Mehrwert-
steuer

3,0

Anlieger-
beiträge,
Gebühren u.a. Verwaltungsein-
nahmen im Straßenwesen

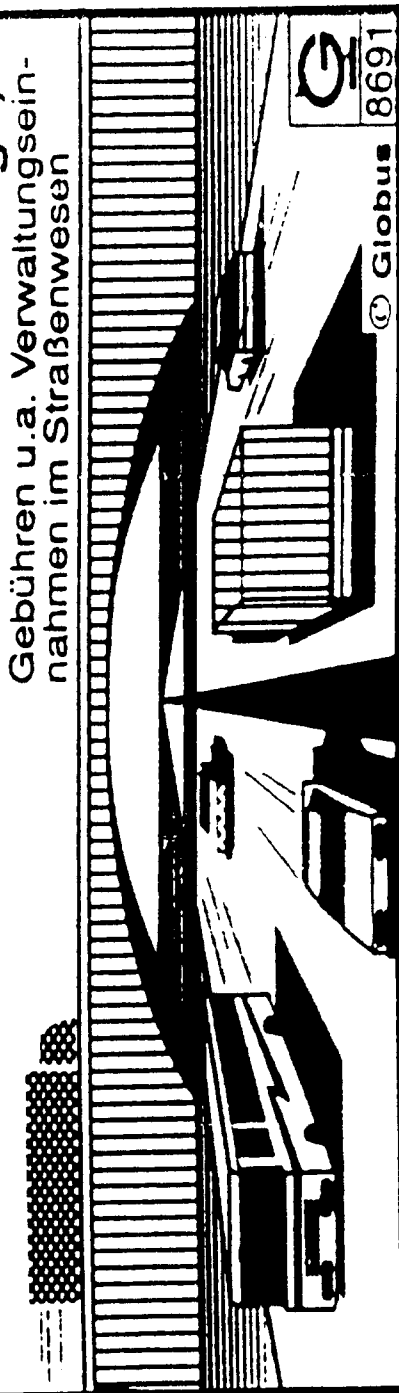
Ausgaben

Straßen-
wesen

21,5
Mrd. DM

Verkehrs-
polizei

3,8



8691

© Globus

APPENDIX A 3
Asphalt Mixing Plant

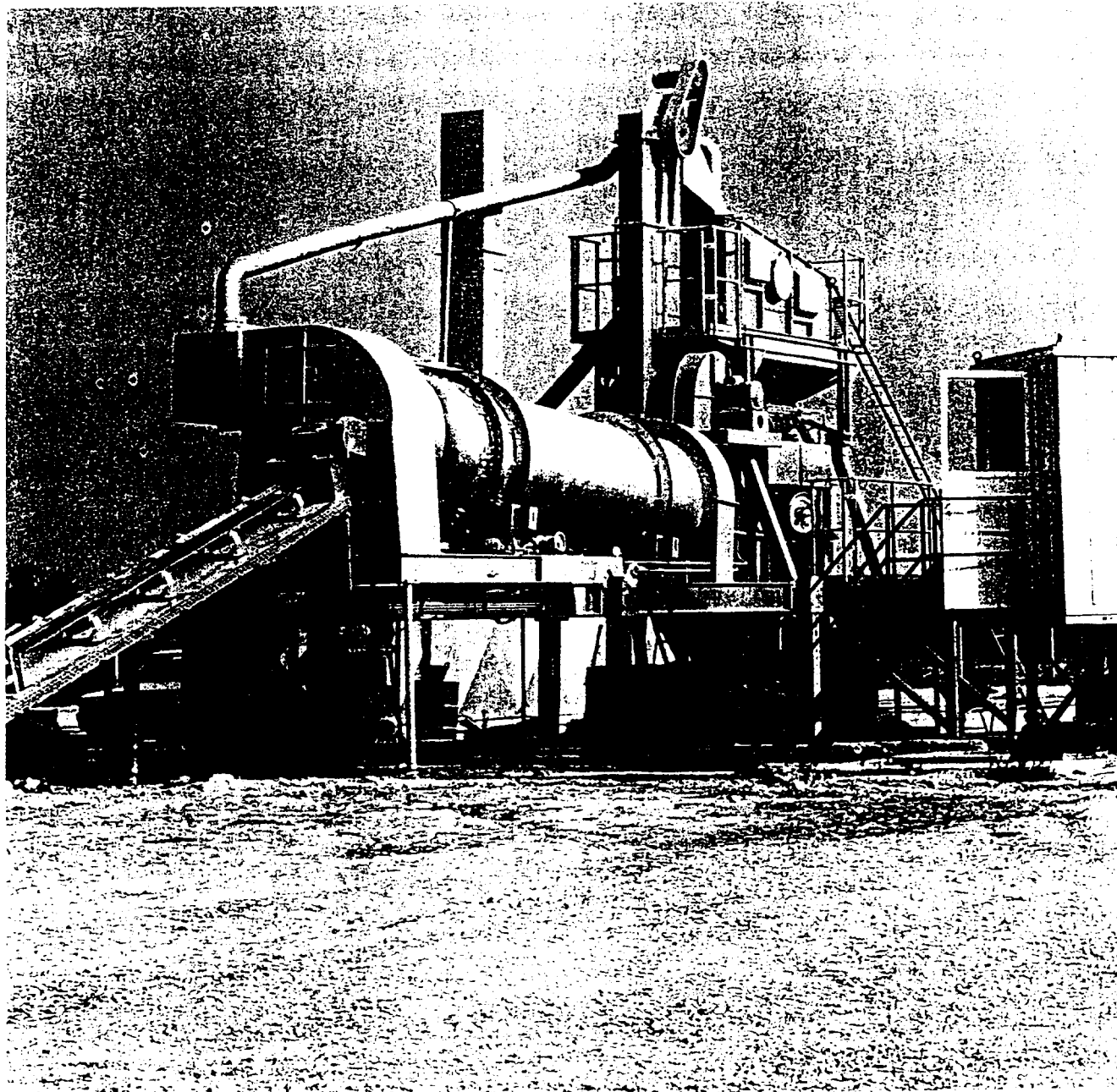
WIBAU

ПЕРЕДВИЖНЫЕ КОМПАКТНЫЕ УСТАНОВКИ

Fahrbare Kompaktanlagen

WHC60

Kompakt und hochmobil für kurzfristigen Standortwechsel.



Fahrbare Kompaktanlagen

WHC 60, 90, 120

Kompakt und hochmobil für
Baustellen mit kurzfristigem
Standortwechsel
Leistung: 60, 90, 120 t/h

Jede WHC Anlage besteht aus transportablen Maschineneinheiten, die für einen schnellen Auf- und Abbau konstruiert sind.

Die WHC 60 ist zweigeteilt in

- die 4-fach Dosiereinheit
- die Trocken-, Misch- und Entstaubungseinheit

Die WHC 90 und WHC 120 ist dreigeteilt in

- die 4-fach Dosiereinheit
- die Trocken- und Entstaubungseinheit
- die Mischeinheit

Mobile compact installations

WHC 60, 90, 120

Compact and highly
mobile for frequent
changes of location
Capacity: 60, 90, 120 t/h

Every WHC installation consists of mobile units which are designed so that they can be assembled and disassembled quickly.

The WHC 60 is divided into:

- the 4 compartment dosing unit
- the drying, mixing and dust extraction unit

The WHC 90 and 120 is divided into:

- the 4 compartment dosing unit
- the drying and dust extracting unit
- the mixing unit

Centrales compactes mobiles

WHC 60, 90, 120

Execution compacte, d'une
grande mobilité, pour trans-
ferts fréquents de sites
Débit: 60, 90, 120 t/h
nes/heure.

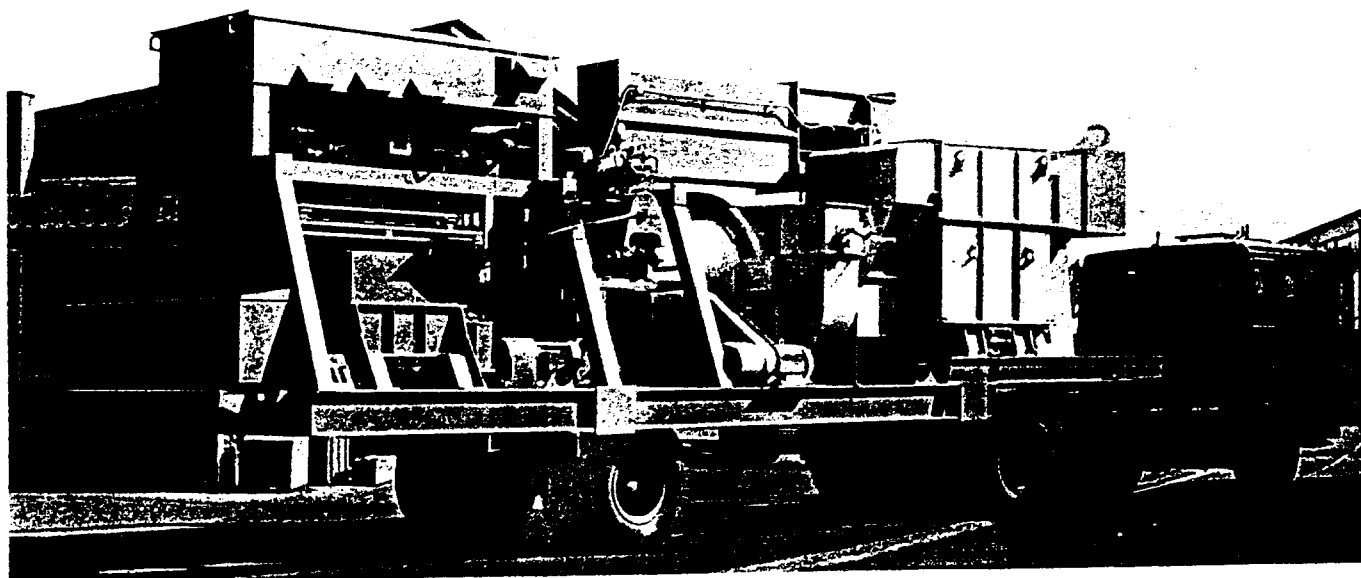
Chaque centrale WHC se compose d'unités transportables, conçues pour un montage et démontage rapide.

La centrale WHC 60 comprend deux unités principales, à savoir:

- l'unité de dosage à 4 compartiments
- l'unité de séchage, malaxage et dépoussiérage.

Les centrales WHC 90 et WHC 120 comprennent trois unités à savoir

- l'unité de dosage à 4 compartiments,
- l'unité de séchage et dépoussiérage,
- l'unité de malaxage



In der WHC-Anlage sind die Erkenntnisse modernster Verfahrenstechnik für Asphalt-Mischanlagen von WIBAU in Einheiten zusammengefaßt, die auf Tiefladern zu transportieren sind. Diese kompakten Anlagen WHC 60, WHC 90 und WHC 120 verfügen über folgende Pluspunkte:

- die Heißmineralstoff-Siebmaschine, 4-fach unterteilt, sibt exakt die Mineralstoffe in die gewünschten Kornfraktionen
- der SPRIDOMAT, kompakt gebaut, dosiert mit einem Höchstmaß an Genauigkeit die Bindemittelmenge

WIBAU asphalt plants for frequent changes of location. In the WHC installation the knowledge of the most modern method of technology for asphalt plants is combined in units for transport on semi trailers. These compact WHC 60, 90 and WHC 120 plants have the following advantages:

- the hot aggregate balance, 4-fold classification, screens the minerals exactly in the required grain fractions
- the SPRIDOMAT, compactly designed, doses the quantity of binding agent with highest degree of accuracy.

Les centrales WHC WIBAU associent les critères d'une technologie de pointe, résultats d'études et de recherches dans le traitement des enrobés, à une conception moderne d'ensembles compactes facilement transportables sur semi-remorque. Les centrales compactes WHC 60, WHC 90 et WHC 120 présentent les avantages suivants:

- le crible d'aggrégats chauds à 4 granulométries assure avec exactitude le criblage des composants minéraux en fonction des granulométries voulues;
- le SPRIDOMAT, de construction compacte dose la quantité de liant requise avec précision;

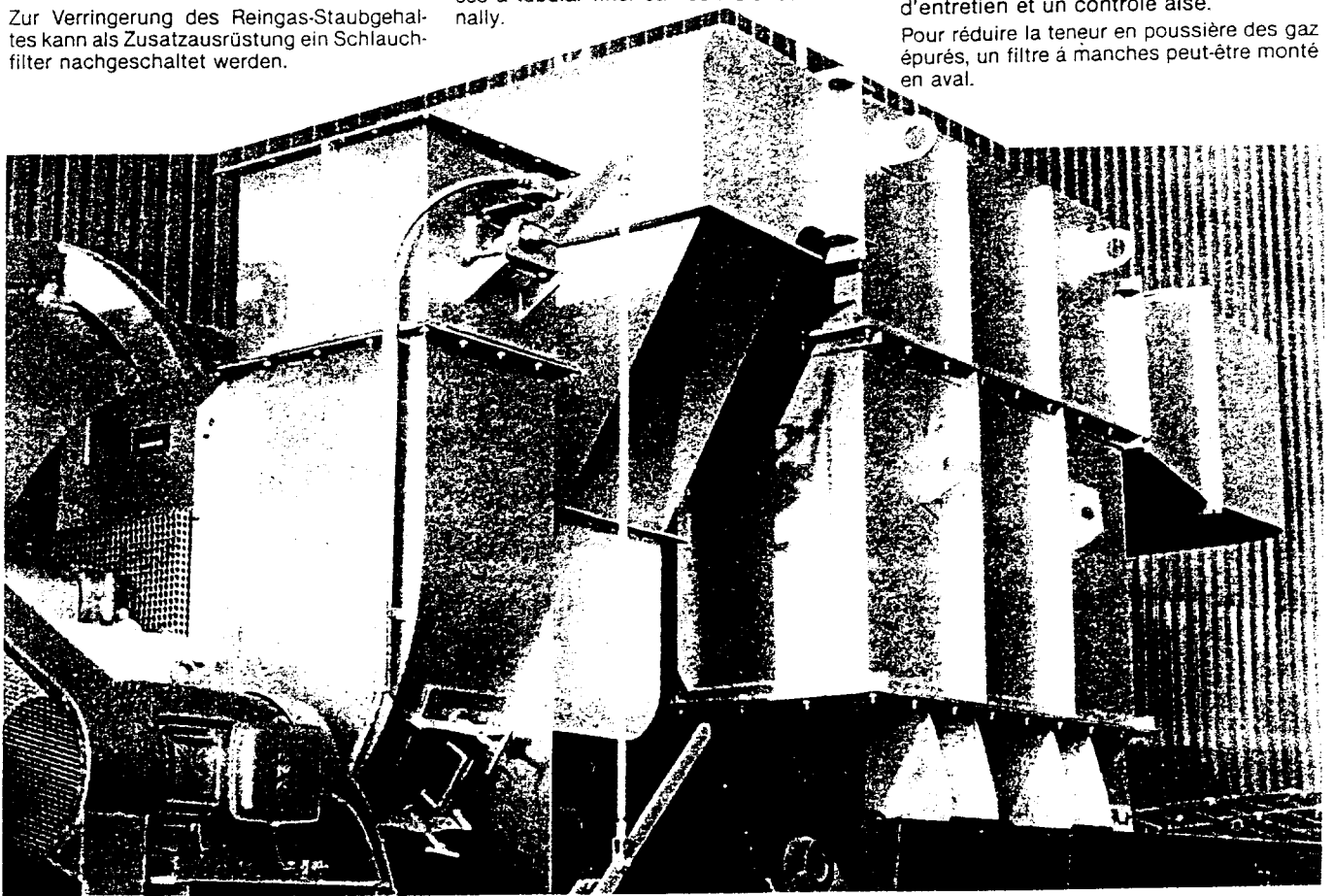
Die kompakt gebaute Multizyklon-Entstaubung reinigt, bei hoher Standzeit der Zyklo- ne, die Abgase aus der Trockentrommel. Der für die Fertigung der Zyklo- ne verwendete verschleißfeste Guß sichert eine lange Lebensdauer. Die wartungs- freundliche Konstruktion ist leicht kontrollierbar.

Zur Verringerung des Reingas-Staubgehal- tes kann als Zusatzausrüstung ein Schlauch- filter nachgeschaltet werden.

The compact multi-cyclone dust extractor cleans the exhaust gases from the drying drum, and it has a long lifetime too. The wear-resistant casted cyclones guaranty a long lifetime. The easy to serve design can be checked without problems. For a more efficient cleaning of the flue gases a tubular filter can be installed additionally.

Le système de dépoussiérage multi- cyclones, de construction compacte à haute durabilité, épure les gaz d'échap- pement provenant du tambour sécheur. L'acier spécial résistant à l' usure utilisé pour la construction des cyclones, garantit une longue durée de vie. La construction offre par ailleurs une grande facilité d'entretien et un contrôle aisé.

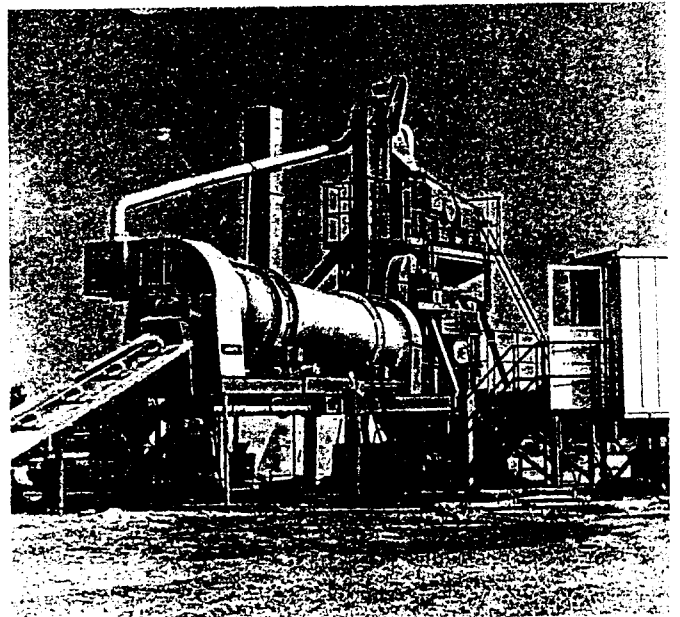
Pour réduire la teneur en poussière des gaz épurés, un filtre à manches peut-être monté en aval.

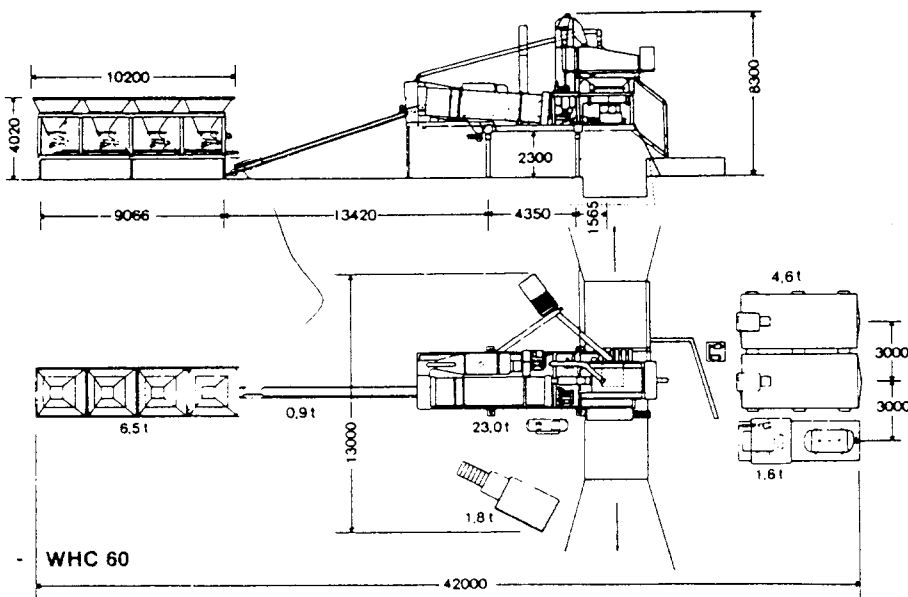
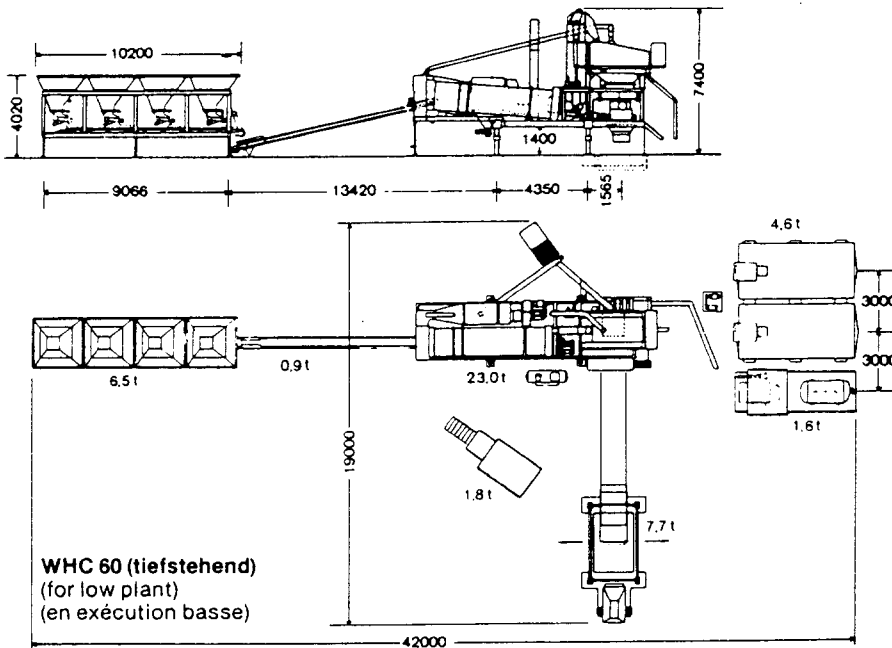
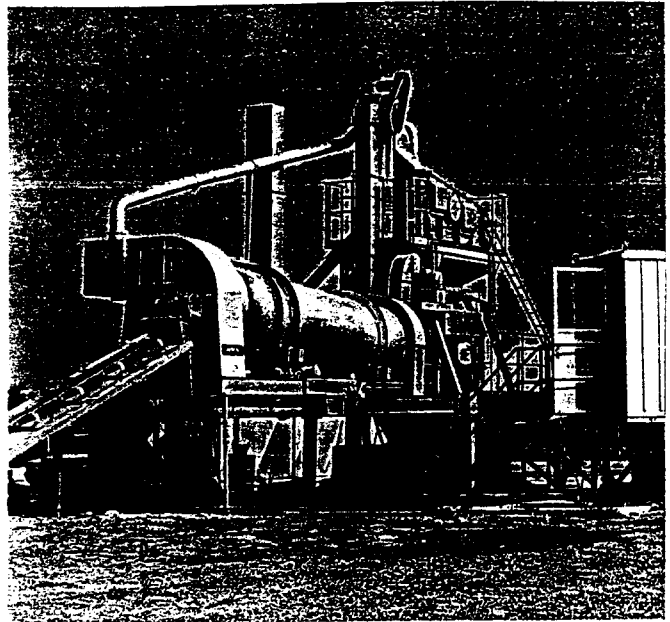
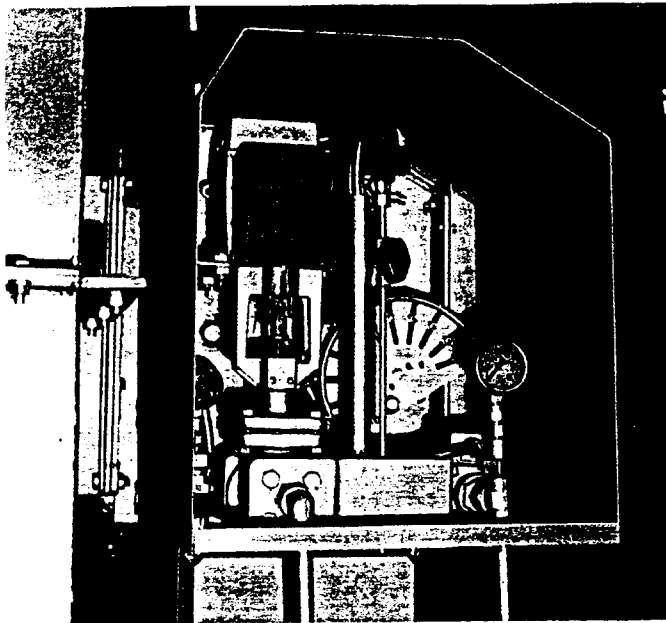


Der moderne Druckzerstäuber-Brenner WZ ist auf die Einbauten der Trockentrommel abgestimmt, wodurch ein hoher thermischer Wirkungsgrad erreicht wird. Dieser fernbedienbare Brenner wurde von WIBAU speziell für den energiesparenden Betrieb von Mineral-Trocknungsanlagen konzi- piert. Der wartungsarme Kettenantrieb läuft geräuscharm und erlaubt durch Kettenum- schlingung auch das Anfahren der ge- füllten Trommel.

The modern high pressure atomizing WZ burner is designed to the drying drum which results in a high thermal efficiency. This remote-controlled burner was specially designed for the energy-saving operation of mineral drying installations. The chain drive, which requires minimum of maintenance, is almost noiseless and, by mounting it on the driving teeth on the periphery of the drum also enables the filled drum to start.

Le brûleur à haute pression WZ, à télé- commande, adapté avec précision au tam- bour sécheur WIBAU garantit une haute efficacité thermique et par conséquent une économie d' énergie. L'unité présente une grande facilité d'entretien et un contrôle aisé. La transmission à chaîne nécessitant peu d'entretien fonctionne silencieuse- ment et permet, grâce à un système parti- culier d'enroulement, de démarrer le tam- bour en charge.





Verlademaße WHC 60	L x B x H m
Vordosierung	10,2x2,5x3,1
Wurfband	11,0x0,9x1,0
Trocken- und Mischanlage	11,2x3,0x3,4
Heißsiebmaschine	4,8x1,7x1,4
Steuerkabine	2,6x2,0x2,7
Thermalöl-Heizaggregat	2,2x1,5x1,5
Bindemittel-Lagertank (1 Stck.)	7,0x2,7x2,9
Verladesilo (für tiefstehende WHC 60)	
– Unterteil	3,1x3,1x2,1
– Oberteil	3,1x2,1x1,5
– Bahndenteil	5,5x1,5x2,0
– Bahnoberteil	7,0x1,5x2,5
– Winde	2,0x1,8x1,1
– Stützen	5,3x2,6x0,8
Loading quantities WHC 60	L x W x H m
prefeeding	10,2 x 2,5 x 3,1
feeding belt	11,0 x 0,9 x 1,0
drying and mixing plant	11,2 x 3,0 x 3,4
hot screening machine	4,8 x 1,7 x 1,4
control cabin	2,6 x 2,0 x 2,7
thermal oil-heating aggregate	2,2 x 1,5 x 1,5
binding agent storage tank	7,0 x 2,7 x 2,9
hot storage hopper (for low erected WHC 60 plant)	
– lower section	3,1 x 3,1 x 2,1
– upper section	3,1 x 2,1 x 1,5
– track end section	5,5 x 1,5 x 2,0
– track upper section	7,0 x 1,5 x 2,5
– winch	2,0 x 1,8 x 1,1
– supports	5,3 x 2,6 x 0,8
Gabarit de chargement WHC 60	L x l x H m
Prédosage	10,2x2,5x3,1
Tapis élévateur	11,0x0,9x1,0
Séchage et malaxage	11,2x3,0x3,4
Crible à chaud	4,8x1,7x1,4
Cabine de commande	2,6x2,0x2,7
Groupe de chauffage à l'huile thermique	2,2x1,5x1,5
Citerne de stockage du liant (1 citerne)	7,0x2,7x2,9
Silo de stockage (pour WHC 60 en exécution basse)	
– partie inférieure	3,1x3,1x2,1
– partie supérieure	3,1x2,1x1,5
– extrémité de la bande	5,5x1,5x2,0
– partie supérieure de la bande	7,0x1,5x2,5
– treuil	2,0x1,8x1,1
– tuyau	5,3x2,6x0,8

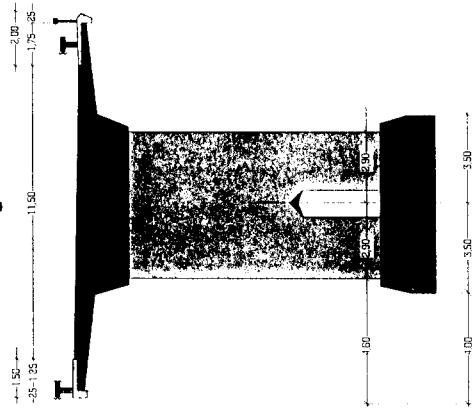
WIBAU Asphalttechnik GmbH
Lagerhausstraße 12
D-63571 Gelnhausen

Telefon 0 60 51/9747-0 · Telefax 0 60 51/9747-20

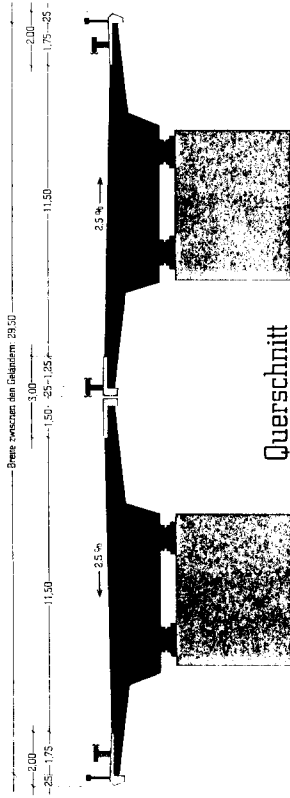
APPENDIX A 4
Kylltal Bridge



Schnitt Bogenständer

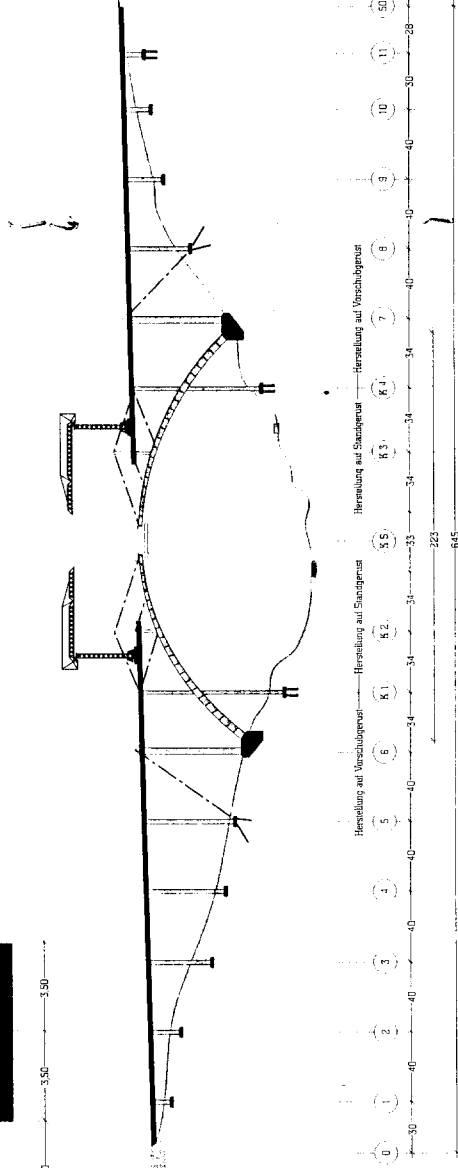


Querschnitt

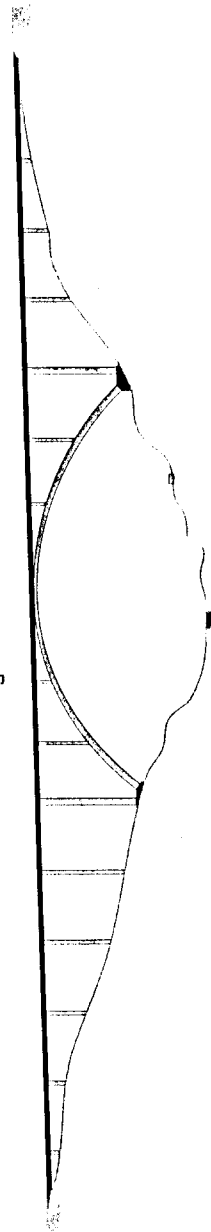


Technische Daten:

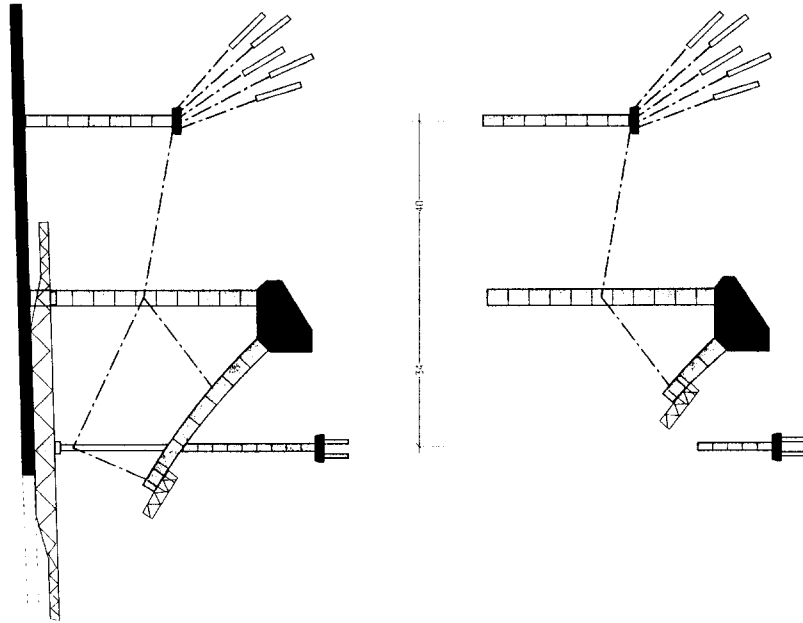
- Bauwerkslänge: 645 m
- Überbautstützweiten: 28 bis 40 m
- Bogenstützweite: 223 m
- Breite zwischen den Geländern: 29,50 m
- Fläche: 19.000 m²
- Höhe über Tal: 93 m
- Konstruktion: Spannbeton - Plattenbalken, d = 1,50-1,80 m
- Überbauten Massivbögen d = 3,50-1,50 m
- Bauverfahren: Überbauten: Vorschubbrüstungen bzw. Ständergerüst.
- Bögen: Freivorbau mit Abspannungen, Hilfspfeilern, Stahlpylonen.
- Felsanker: 116 Stück, je 270 MP Zugkraft, i. M. 45 m lang
- Massen: Beton Überbauten: 25.000 m³ Schläuffelstahl: 4.500 t
- Beton Überbauten: 21.000 m³ Spannstahl 690 t
- Kosten: 60 Mio DM (3150,- DM/m³)
- Bauzeit: 5 Jahre



Längsschnitt - Ansicht



Grundriss



Details Bauzustand

