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ADA 084188

DIRECTORY OF CONSTRUCTION ENGINEERING PROGRAMS
IN
ORGANIZATION AND MANAGEMENT OF CONSTRUCTION

PREPARED BY
CIB W-65 COMMISSION
ON
ORGANIZATION AND MANAGEMENT OF CONSTRUCTION

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ELECTE **D**
MAY 14 1980
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DEPARTMENT OF THE ARMY
CONSTRUCTION ENGINEERING RESEARCH LABORATORY
CHAMPAIGN, ILLINOIS USA

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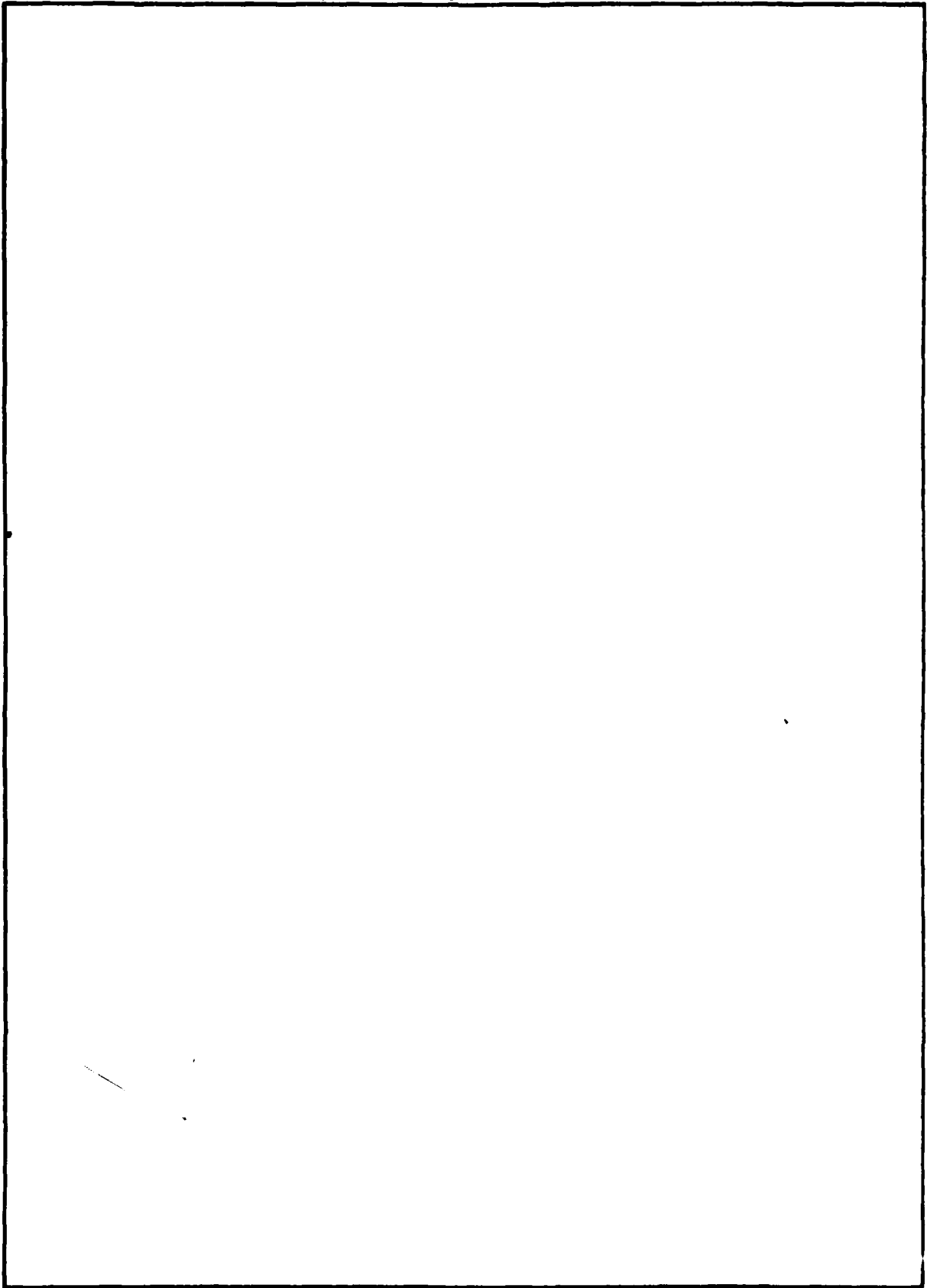
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ABSTRACT (Continue on reverse side if necessary and identify by block number) This first edition of a directory of education programs in engineering and management covers 20 programs in 11 countries. CIB Working Commission 65, Organization and Management of Construction, plans to update the directory periodically.		

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PROLOGUE

The Working Commission W-65, Organization and Management of Construction, (OMC) consists of experts who are addressing research contained in the terms of reference which reads in part: "To develop effectiveness calculations and techniques for evaluating singularly and collectively various organizational forms utilized in the planning, architecture, engineering, construction and for industrialized construction." A major aspect of the program is to effect the transfer of the research into professional practice; a vital mechanism in this transfer are the educational programs in engineering and management.

To facilitate the interchange among experts in education for OMC the Commission recommended the publication of a directory of education programs. This is the first edition of the directory. W-65 intends to update this directory on a regular basis. Information on additional educational programs is welcomed; it should be forwarded to Dr. V. Handa of the Waterloo Construction Council, University of Waterloo, Waterloo, Ontario, CANADA N2L 3G1. Additional copies of the directory are available at a modest charge from the National Technical Information Service (NTIS), Springfield, VA 22151, USA.

Information on W-65 can be obtained by contacting undersigned at the US Army Construction Engineering Research Laboratory, P. O. Box 4005, Champaign, IL 61820, USA. Information on CIB can be obtained by contacting Secretary General, CIB, Postbus 20704, Weena 704, Rotterdam, HOLLAND.

25 April 1980
Champaign, Illinois, USA

L. R. SHAFFER
Coordinator, W-65

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Waterloo Construction Council

Department of Civil Engineering
University of Waterloo
Waterloo, Ontario, Canada
N2L 3G1



Telephone: (519) 885-1211 ext. 2289

March 19, 1980

CIB - Working Commission 65 - Organization and Management of Construction

CONSTRUCTION EDUCATION SURVEY - March 1980

There were 20 replies to the questionnaire sent out in April/May 1979. Three were from the Republic of South Africa, three from Asia - Turkey (2) and Israel, one from Australia, eight from North America - USA (5), Canada (3) and five from Europe - England, Holland, Germany, Switzerland and Denmark. On the basis of the responses it can be seen that the earliest undergraduate programme was established in 1930 at Munich with Florida (1935) closely behind. A fair number of the graduate programmes were established between the late sixties and the early seventies. Most of the research is supported either by government or other means. Industry support for scholarships (6 responses) is better than for research. Their support for administration is 100% in South Africa and in varying amounts elsewhere (3 indicated no direct industry support). Nearly all responses indicated industry liaison and the participation of industry speakers and visitors in their programme, indicating an attempt at keeping the programmes en current. It is something that should be encouraged and probably expanded. The academic curriculum appears to be somewhat similar if liberal allowance is made for interpreting course titles. A lot of the research appears to be concentrated on management and organizational control techniques, indicating that the problems are the same across the different parts of the world.

My appreciation and thanks to all the respondees for their effort in this first venture at establishing some sort of a base for interchange amongst the construction academic fraternity.

V. K. Handa, Professor
Department of Civil Engineering
University of Waterloo
Waterloo, Ontario N2L 3G1
Canada

VKH:pl

April 5, 1979

At the request of the educators attending the 2nd CIB Symposium on Construction Organization and Management held in Hai fa last November, the W-65 Commission undertook to act as a clearing house to gather, collate and DISSEMINATE information on construction education and training programmes. The University of Waterloo Construction Programme has agreed to act as the co-ordinator in this effort.

This is to request your co-operation in this venture. In order to avoid any misinterpretation of information no editing will be done at Waterloo. To expedite matters and minimize effort on your report, the response is limited to one page. Your help in answering the questionnaire will be most appreciated.

Dr. L.R. Shaffer, Co-ordinator of the W-65 Commission, has kindly agreed to disseminate the information to all the respondees after its processing at Waterloo.

Please type or print your response in black ink, as the forms will be reduced and reproduced for distribution. Return the completed questionnaire to:

Prof. V.K. Handa
Department of Civil Engineering
University of Waterloo
Waterloo, Ontario N2L 3G1
Canada

Please forward the extra copies enclosed to other institutions who have construction programmes in your area. The following have already been requested directly by us.

April 5, 1979

3. Organizational and Legal Responsibilities in Construction Management by Dycker, (Paper, 8 p) Canadian Building Contracts
4. Administration of Construction Projects
5. Construction Methods and Equipment Publication #4 and 6 below
6. Construction Planning (Operations Research)

Name of Institution University of Waterloo
 Faculty/School Department of Civil Engineering, Construction Management Group
 Address Waterloo, Ontario Canada N2L 3G1

Name, Title of Contact Dr. V. K. Handa, P. Eng.
 Name, Title of Responder

Programme/s offered	Degree	Degree	Non-dg.	Part of	Other:
	Bachelor	Master	Diploma	Certificate	Programme
Year Programme Established	1977	1971	1961	/	
Duration (years) - length of Programme	12 months	8 months	one course	senior year	undergraduate
Availability (Indicate current student nos)	2	1			
Part-time	10				
Other (specify)					
National	10				
Foreign	2				
Admission Requirements	undergraduate honours				
Course Requirements - list of courses needed & thesis/project	degree 73% average 8 + project				
Scholarship, Fellowship	6				
Bursaries, etc. available	Yes - varying amounts				
	Yes				

Language of Instruction	English	National	68	Foreign	3
Total Numbers of Students Graduated	Administration	Scholarship	Research		
Funding: Government	x	x	x		
Industry	100%	100%	x		
Other (specify)	x	x	x		
Staff Numbers: Totals (Indicate \$,)	Faculty	Full Time (3)	Part time (3)	Industry, Instructors, Speakers (29)	
Industry Input (Please tick)	Financial Administrative (x)	Curriculum Development x			
Course, Titles, Descriptions (Indicate Text Title (if any))	Scholarship, Bursaries, etc(x)	Overseeing Body Industry Liaison (x)			

1. Labour Relations in the Construction Industry Publication # 142 below
2. Construction Economics. Accounting and Finance. Finance for the Non Financial Manager by H. T. Spiro (Wiley, Interscience) Const. Accounting (continued) A Financial Management by Coombs and Palmer (McGraw Hill).

Educational Programme Objectives:
 Provide a vehicle by which the performance of the Construction Industry is improved. The objectives are to: 1) transmit existing management techniques through research in order that they can be applied to construction, and 2) educate professionals on the application of these techniques towards resolving the special problems of construction. Organizational (Applied) (x) Engineering (Hard) () (Please tick)

Research Funding (Indicate source & amount (US \$)) National Research Council, Industry Contracts 8000 - 10,000 per year 3000 - 4000

Describe Nature/objectives of Research Organization, Management, some operations research techniques, labour relations, safety. Attempts being made to increase direct input from industry with respect to research objectives and needs.

Research Facilities (Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

1. Allen, P. M. and Eayrs, M. H., Labour Relations for Construction Employers in Ontario 1972, (\$5.00) + postage and handling
2. Allen, P. M., A Study Guide to Employee Relations 1973 (\$3.00)
3. Campbell, D. H., Construction Equipment Management, 1974 (\$5.00)
4. Campbell, D. H. Craning Principles, 1974 (\$5.00)
5. Equity in Construction Contracts and Claims, Proceedings of Seminar May 1976 (\$8.00)
6. Campbell, D. H., Construction Equipment Management 1978 (\$9.75)

(x) Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

- 3.
- 4.
- 5.
- 6.

Name of Institution: Bradley University
 Faculty/School: 1501 W. Bradley Avenue
 Address: Peoria, IL 61625 U.S.A.
 Name, Title of Contact: M. I. Guest, Professor, Chairman, Dept. of Construction
 Name, Title of Respondee: Art: Department of Construction

Programme/s offered: Degree Bachelor Non-deg. Non-deg. Part of Other: Certificate Programme Specify
 Year Programme Established: Ca. 1958
 Duration (years) - length of Programme: 4 yrs.

Availability (Indicate current student nos): Part-time 4, Full-time 130, Other (specify) --
 National Year 1978-79: 127
 Foreign: 3

Admission Requirements: High School graduate, ACT Composite 20min, SAT 975 combined (min). See University catalog for details.
 Course Requirements - list of Minima: Construction 50 sem hrs, Management 14 sem hrs, course needed & thesis/project Math/Science 24 sem hrs, Humanities/Social Science 23 sem hrs; electives to add to 124 sem hrs. minimum
 Scholarship, Fellowship Bursaries, etc. available: Limited; administered by Financial Aids Office

Language of Instruction: English
 Total Numbers of Students Graduated since 1966: National 335, Foreign 2

Funding: Government, Industry, Other (specify) Administration, Scholarship, Research
 Staff Numbers: Faculty Full Time (4), Part time (1), Industry, Instructors, Speakers ()

Industry Input (Please tick): Financial Administrative (), Curriculum Development (x), Scholarship, Bursaries, etc(x), Overseeing Body, Industry Liaison (x)

Course, Titles, Descriptions: 1. See attached lists. Insufficient room provided to describe 18 Construction courses plus other course requirements for a BS degree.
 Indicate Text Title (if any): 2.

Educational Programme Objectives: To provide the basic (BS) professional degree for the Constructor. To this end the curriculum provides the balanced cultural, technical, managerial and professional foundation necessary for a career and for further individual development.

Research None (X) Organizational (Applied) () Engineering (Hard) () (Please tick)

Research Funding (Indicate source & amount (US \$) None

Describe Nature/objectives of Research None

Research Facilities (Describe briefly if any) None

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

- Adrian, James J., Quantitative Methods in Construction Management, Elsevier, 1973
- Adrian, James J., Business Practices for Construction Management, Elsevier, 1976
- Adrian, James J., Construction Accounting, Reston, 1979

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

(continued)

BRADLEY UNIVERSITY
College of Engineering and Technology
CONSTRUCTION CURRICULUM (Typical)

Junior Year

First Semester	Hours
CON 342 Construction Equipment and Methods	3
CON 368 Advanced Environmental Technologies in Construction	3
CON 372 Materials and Methods of Construction III	3
*EFE 300-Level Advanced Writing	3
Approved Management Elective	3
	<u>15</u>

Second Semester	Hours
CON 310 Construction History	3
CON 392 Construction Management	3
C/E 320 Introductory Soil Mechanics	2
Accounting (ATG 157 or ATG 300)	2-3
Approved Management Electives	6
	<u>16-17</u>

Senior Year

First Semester	Hours
CON 486 Structures I	4
CON 492 Construction Contracts	2
BMA 352 Business Management	3
Approved Construction, Management, Mathematics or Science Electives	6
	<u>15</u>

Second Semester	Hours
CON 408 Senior Seminar	2
CON 409 Structures II	4
CON 494 Construction Practice	3
CON 496 Construction Estimating	3
Approved Elective	3
	<u>15</u>

Note: This typical program will be modified as necessary for those admitted with academic deficiencies; such students will of necessity require additional semester hours and time for completion.

Possible modifications in cooperation with other departments to meet special career needs:
1. Emphasis on Electrical Construction Management
2. Emphasis on Mechanical Construction Management
3. Emphasis on Heavy Construction

* All-University requirement
4/76

BRADLEY UNIVERSITY
College of Engineering and Technology
CONSTRUCTION CURRICULUM (Typical)

Freshman Year

First Semester	Hours
CON 100 Introduction to Construction	2
*EFE 101 Composition and Rhetoric	3
MTH 121 Unified Calculus I	4
PSY 103 Psychology	3
Approved Humanities or Social Science Elective	3
	<u>15</u>

Second Semester	Hours
CON 132 Construction Graphics	3
*SPT 103 Basic Speech	3
EEO 100 Economics	3
PHY 104 Foundations of Modern Physics	3
MTH 122 Unified Calculus II	4
	<u>16</u>

Sophomore Year

First Semester	Hours
CON 270 Materials and Methods of Construction I	3
C/E 206 Surveying	4
TSC 206 Statics	3
ONS 104 Introductory Fortran Programming	3
Approved Humanities or Social Science Elective	3
	<u>16</u>

Second Semester	Hours
CON 262 Mechanical and Electrical Systems for Buildings	3
CON 272 Materials and Methods of Construction II	3
TSC 307 Strength of Materials	4
Approved Construction, Management, Mathematics or Science Electives	6
	<u>16</u>

* All-University requirement
10/77

April 5, 1979

Name of Institution University of Florida
 Faculty/School School of Building Construction
 Address Gainesville, Florida 32611 USA

Name, Title of Contact Don A. Halperin, Director
 Name, Title of Responder Same

Educational Programme Objectives: To teach youngsters to think within the confines of the discipline of construction

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()
 Difficult, in fact

Research Funding (Indicate source & amount (US \$))

Describe Nature/objectives of Research

Teaching to us seems far more important

Research Facilities Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

x) Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

Programme/s offered Degree Degree Degree Non-deg. Non-deg. Part of Other:
 Bachelor Master Ph.D. Diploma Certificate Programme Specify

Year Programme Established 1935 1957

Duration (years) - length of Programme 4 1

Availability (Indicate current student nos) Part-time Full-time Equivalent - 35 25
 (2 years general education + 2 years professional)

National Year Foreign Taking Electives
 60

Admission Requirements 2 yrs. College for Bach.; "B" average + 1000 graduate record
 exam plus degree in Bus. Ad., Building Const., Civil Eng or
 Architecture M.S.

Course Requirements - list of courses needed & thesis/project See attached sheets

Scholarship, Fellowship Bursaries, etc. available Several Scholarships, Teaching assistants

Language of Instruction English

Total Numbers of Students Graduated National 2300+ Foreign 30+

Funding: (Indicate %) Government 100
 Industry
 Other (specify)

Staff Numbers: Totals (Indicate #s) Faculty Full Time (17) Part time (6) Industry, Instructors, Speakers (4)

Industry Input (Please tick) Financial Administrative () Curriculum Development
 Scholarship, Bursaries, etc(X) Overseas Body/Industry Liaison ()
 Course, Titles, Descriptions Whatever that means
 Indicate Text Title (if any) See attached sheets

(continued)

SCHOOL OF BUILDING CONSTRUCTION
University of Florida

GRADUATE STUDIES

Advanced Construction Techniques
Temporary Structures
Construction Methods Improvement
Construction Methods Improvement
Survey of Construction Techniques
Construction Cost Analysis
Labor Problems
Special Studies in Construction (Combined Structures)
Special Studies in Construction (Construction Uses of Computers)
HI-Rise Construction
Construction Management
Human Factors in Construction
Advanced CPM
Construction Management Accounting
Bidding Strategy
Earthwork
Philosophy of Structures

SCHOOL OF BUILDING CONSTRUCTION
University of Florida

Undergraduate Students

Construction Materials
Construction Mechanics I
Construction Techniques I
Construction Techniques II
Construction Techniques III
Construction Drawing
Construction Methods Laboratory
Construction Mechanics II
Structures I
Structures II
Quantity Surveying
History of Construction
Computers in Construction
Construction Techniques Iv
Structures III
Temporary Structures
Environmental Technology I
Environmental Technology III
Environmental Technology II
Construction Estimating
Cost Estimation Analysis
Construction Management I
Construction Management III
Construction Labor
Construction Planning and Control
Construction Management II
Site Development

April 5, 1979

A Construction Management Programme is run annually at:

Name of Institution UNIVERSITY OF CAPE TOWN

Faculty/School

Address RONDEBOSCH, CAPE. R.S.A.

Name, Title of Contact MR. M.C. VORSTER
CO-ORDINATOR

Programme/s offered Degree Bachelor Degree Master Ph. D. Non-deg. Diploma Certificate Programme Specify Part of Other:

Year Programme Established
Duration (years) - length of Programme

Availability (Indicate current student nos) Part-time Full-time Other (specify)

National Year Foreign

Admission Requirements GRADUATE WITH 5 YEARS PLUS MANAGEMENT EXPERIENCE.

Course Requirements - list of courses needed & thesis/project
Scholarship, Fellowship Bursaries, et c. available

Language of Instruction ENGLISH

Total Numbers of Students Graduated National 90 Foreign

Funding: (Indicate %) Government 100% Industry Other (specify) Administration Scholarship Research

Staff Numbers: Totals (Indicate #s) Faculty Full Time () Part time (1) Industry, Instructors, Speakers (7)

Industry Input (Please tick) Financial Administrative (✓) Curriculum Development Scholarship, Bursaries, etc (✓) Overseeing Body Industry Liaison (✓)

Course, Titles, Descriptions (Indicate Text Title (if any)) CONSTRUCTION MANAGEMENT COVERS:

1. OPERATION ANALYSIS FOR WORK IMPROVEMENT
2. PROJECT PLANNING AND CONTROL

(continued)

3. CONTRACT LAW AND INSURANCE.

4. THE HUMAN FACTOR.

5. MANAGEMENT ACCOUNTING AND FINANCE.

6. MEASUREMENT AND VALUATION.

Educational Programme Objectives:

To provide professional management training to those with a purely technical background.

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$))

Describe Nature/objectives of Research

Research Facilities (Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check if interested in having above listed in National Technical Information Service for wide distribution. (Separate instructions will follow on procedures for submittal).

April 5, 1979

A CONSTRUCTION MANAGEMENT PROGRAMME IS RUN ANNUALLY AT:

Name of Institution UNIVERSITY OF PRETORIA
 Faculty/School
 Address PRETORIA, 0002, R.S.A.

Name, Title of Contact MR. F. FOURIE
 Name, Title of Respondee CO-ORDINATOR

Programme/s offered Bachelor Degree Non-deg. Non-deg. Part of Other:
 Bachelor Master Ph. D. Diploma Certificate Programme Specify

Year Programme Established 1976
 Duration (years) - length of CMP
 Programme 6 WEEKS
 Availability (Indicate current (with examination, included as a credit for the B.Sc. (Hons.) in Construction Management)
 Part-time 1978
 Full-time 55
 Other (specify)

National Year PRETORIA
 Foreign

Admission Requirements Graduate with + 5 years experience.

Course Requirements - list of courses needed & thesis project

Scholarship, Fellowship Bursaries, etc. available

Language of Instruction ENGLISH

Total Numbers of Students Graduated Attended since 1976 National 66 Foreign

Funding: Government 100%
 Industry
 Other (specify)

Staff Numbers: Totals Faculty Full Time () Part time (2) Industry, Instructors, Speakers (5)

Industry Input (Please tick) Financial Administrative (✓) Curriculum Development Scholarship, Bursaries, etc (✓) Overseasing Body Industry Liaison (✓)

Course, Titles, Descriptions CONSTRUCTION MANAGEMENT PROGRAMME COVERS:
 Indicate Text Title (if any)

1. FINANCIAL MANAGEMENT

2. PROJECT PLANNING AND CONTROL

(continued)

- 3. CONTRACT LAW
- 4. ENGINEERING ECONOMY
- 5. OPERATIONS ANALYSIS
- 6. CONSTRUCTION PLANT

Educational Programme Objectives:

To provide professional management training to those with a purely technical background.

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$))

Describe Nature/objectives of Research

Research Facilities (Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

April 5, 1979

-2-

- 3. THE CONTRACT (LEGAL ASPECTS)
- 4. COSTING AND ACCOUNTING
- 5. EARTHMOVING METHODS AND EQUIPMENT
- 6.

Name of Institution CIVIL ENGINEERING INDUSTRY TRAINING BOARD
 Faculty/School PRIVATE BAG 1 GARDENVIEW 2047
 Address REPUBLIC OF SOUTH AFRICA

Name, Title of Contact MR. R. G. SFAKIANOS
 Name, Title of Respondee DIRECTOR OF TRAINING

Programme/s offered Degree Degree Non-deg. Non-deg. Part of Other:
 Bachelor Master Ph.D. Diploma Certificate Programme Specify

Year Programme Established 1978
 Duration (years) - length of 1 week
 Programme

Availability (Indicate current student nos) Part-time Full-time Other (specify) + 25 per course

National Year Foreign

Admission Requirements CONSTRUCTION EXPERIENCE IN SITE MANAGEMENT LEVEL - BETWEEN 2 TO 5 YEARS.
 Course Requirements - list of courses needed & thesis/project

Scholarship, Fellowship Bursaries, etc. available

Language of Instruction

Total Numbers of Students Graduated National + 170 Foreign
 Administration Scholarship Research

Funding: Government 100%
 (Indicate %) Industry Other (specify)

Staff Numbers: Totals Faculty Full Time () Part time (2) Industry, Instructors, Speakers & (Indicate #s)

Industry Input Financial Administrative (X) Curriculum Development
 (Please tick) Scholarship, Bursaries, etc () Overseeing Body Industry Liaison (X)

Course, Titles, Descriptions Indicate Text Title (if any)

- 1. METHOD STUDY

- 2. PROJECT PLANNING & RESOURCE MANAGEMENT

(continued)

Educational Programme Objectives:

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$))

Describe Nature/objectives of Research

Research Facilities (Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

6

3. DRAWING AND DESIGN
4. BUSINESS MANAGEMENT FOUNDATION
5. LIBERAL ARTS AND SCIENCES
6. ELECTIVES

Name of Institution KRATT INSTITUTE
 Faculty/School CONSTRUCTION MANAGEMENT PROGRAM / SCHOOL OF ARCHITECTURE
 Address HIGGINS HALL, BROOKLYN, NEW YORK 11205
 Name, Title of Contact NATHAN STREITMAN, CHAIRMAN, CONSTR. MGMT.
 Name, Title of Respondee " "

Programme/s offered Degree Degree Non-deg. Non-deg. Part of Other:
 Master Ph.D. Diploma Certificate Programme Specify

Year Programme Established 1945
 Duration (years) - length of Programme FOUR
 Availability (Indicate current student nos) Part-time 64
 Full-time 28
 Other (specify) 75 PERCENT US. 25 PERCENT FOREIGN
 National Year HIGH SCHOOL DIPLOMA OR EQUAL.
 Foreign 132 CREDITS INCLUDING THESIS REQUIRED
 Admission Requirements YES
 Course Requirements - list of courses needed & thesis/project
 Scholarship, Fellowship Bursaries, etc. available

Educational Programme Objectives: TO PROVIDE A LIBERAL AND PROFESSIONAL EDUCATION TO STUDENTS SEEKING A MANAGEMENT CAREER IN CONSTRUCTION FROM THE CONCEPT STAGES THROUGH TO COMPLETION OF CONSTRUCTION.
 Research Organizational (Applied) Engineering (Hard) ()
 (Please tick)

Research Funding (Indicate source & amount (US \$)) 0

Describe Nature/objectives of Research ---

Research Facilities (Describe briefly if any) ---

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print) ---

Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

Language of Instruction ENGLISH
 Total Numbers of Students Graduated National 400 Foreign 100
 Funding: Government Administration Scholarship Research
 (Indicate %) Industry 0% 0% 10% 0%
 Other (specify) STUDENT \$ 100% 80% 0%
 Staff Numbers: Totals Faculty Full Time () Part time (20) Industry, Instructors, Speakers (10)
 (Indicate #'s)
 Industry Input Financial Administrative Curriculum Development
 (Please tick) Scholarship, Bursaries, etc Overseeing Body Industry Liaison ()
 Course, Titles, Descriptions SUBJECT AREAS FOR DEGREE PROGRAM
 Indicate Text Title (if any) 1. CONSTRUCTION MANAGEMENT
 2. CONSTRUCTION THEORY

(continued)

- 7. Construction Labour Economics and Labour Relations
- 8. Analysis in Real Estate Development
- 9. Legal Problems in Construction
- 10. Legal Regulation of the Building Process
- 11. Seminar in Construction Engineering and Management
- 12. Project and Company Organizations

Name of Institution Massachusetts Institute of Technology
 Faculty/School Dept. of Civil Engineering, Room 1-253
 Address Cambridge, MA 02139

Name, Title of Contact Robert D. Logcher
 Name, Title of Responder Professor of Civil Engineering

Programme/s offered Degree Master Ph.D. Diploma Certificate Programme Specify Part of Other:
 Bachelor 1974

Year Programme Established	1978	1972	1977	-	-	-	-	-	-
Duration (years) - length of Programme	4	1	3-5	-	-	-	-	-	2-3
Availability / Indicate current student nos	-	6	-	-	-	-	-	-	-
Part-time	6	30	4	1	1	1	1	1	1
Full-time	6	19	1	0	0	0	0	0	0
Other (specify)	0	11	3	1	1	1	1	1	1
National	0	11	3	1	1	1	1	1	1
Year 1978-79	0	11	3	1	1	1	1	1	1
Foreign	0	11	3	1	1	1	1	1	1

Admission Requirements
 Course Requirements - list of courses needed & thesis/project (See attached)
 Scholarship, Fellowship, Bursaries, etc. available Rarely available, graduate assistantships support about 35% of graduate students

Language of Instruction	English	National	52	Foreign	28	Research
Total Numbers of Students Graduated						
Funding: (Indicate %)	Government	0	0	0	95	
Industry	0	0	5	0		
Other (specify)	0	0	0	0		
Staff Numbers: (Indicate #s)	Faculty	Full Time (35)	Part time (11)	Industry, Instructors, Speakers (-)		
Industry Input (Please tick)	Financial Administrative ()	Curriculum Development	Scholarship, Bursaries, etc ()	Overseeing Body Industry Liaison ()		

- Course, Titles, Descriptions All Graduate Courses:
 Indicate Text Title (if any):
 1. Introduction to Project Management
 2. Construction of Buildings
 3. Project Organization and Control
 4.65. Modelling of Construction Processes I & II
 6. Resources & Markets in Construction

Educational Programme Objectives: - Treat entire development process technical problem and decision processes for design & constr. processes
 - Develop & introduce new techniques & approaches to
 - Train new leaders to work for owners, designers & contractors
 Organizational (Applied) () Engineering (Hard) ()

Research (Please tick)
 Research Funding U.S. Dept. of Transportation \$240,000
 (Indicate source & amount (US \$) Jewish Agency for Israel 150,000
 U.S. Dept. of Labor 21,000
 U.S. Dept. of H.U.D. 281,000
 Describe Nature/objectives of Research

Research Facilities (Describe briefly if any) Extensive materials, soils and rock mechanics laboratories
 Extensive computational facilities, including interactive graphics.

Publications by Programme - only those - COSTHOD: A Cost Modeling System-User's Manual, R77-15 that can be purchased (do not list articles - Analysis of Component Interfaces and Effect on Construction Coordination, MIT Department of Civil Engineering, R77-42.
 -Productivity Improvement Study-Summary Cost Report, Dec. 1977, R77-43.
 -Summary Report-Project for Innovation and Improvement in Housing, Jan. 1978.
 -The Effect of Technology on Scheduling: A Comparative Study of U.S. and Israeli Residential Construction, R78-2.
 -An Approach to Cost Estimating for Planning and Design-Part I: System Concepts and Specifications, March 1978, Technical Report 062. IBM Israel.
 -Burns, R.H., Levitt, R.E. and Logcher, R.D., Cooperative Control Systems for Improving Construction Productivity, No. 630, June 1978.

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

Advanced Cost and Value Engineering
 Construction Planning and Scheduling
 Construction Labor Management
 Advanced Building Estimating
 Conceptual Estimating

Name of Institution University of Southern California
 Faculty/School Civil Engineering Dept of Civil Engineering
 Address University of Southern California
 Los Angeles California 90089
 Name, Title of Contact Prof. E. L. Bidwell
 Name, Title of Respondent John Bidwell
 Position in Company Prof. Bidwell

Programme/s offered Bachelor Degree Non-deg. Non-deg. Part of Other:
 Master Ph.D. Diploma Certificate Programme Specify

Year Programme Established 1970 1970
 Duration (years) - length of 15 units 30 units
 Programme 1 unit is 3 hrs of class/1 hr for 15 hrs

Availability (Indicate current student nos)
 Part-time 5 10
 Full-time 15 15
 Other (specify)

National Year
 Foreign
 Admission Requirements Bachelor's degree & undergraduate average in any construction related administrative, design or technical science.
 Course Requirements - list of 30 units of course work beyond the Bachelor's degree courses needed & thesis/project
 Scholarship, Fellowship Bursaries, etc. available

Language of Instruction English
 Total Numbers of Students Graduated National ~ 30 Foreign ~ 30
 Administration Scholarship Research 50%

Funding: Government
 (Indicate %) Industry
 Other (specify) USC via Private Institution
 Faculty Full Time () Part time (10) Industry, Instructors, Speakers ()

Staff Numbers: Totals (Indicate %)
 Industry Input (Please tick)
 Course, Titles, Descriptions
 Indicate Text Title (if any)
 Financial Administrative () Curriculum Development
 Scholarship, Bursaries, etc (4) Overseeing Body Industry Liaison ()
 Contracts and Specifications
 Construction Contracting
 General Construction Estimating
 Construction Methods and Equipment
 Functions of the Constructor
 Construction Accounting and Finance
 Heavy Construction Estimating
 Building Design Processes

Educational Programme Objectives:

To educate engineers for responsible careers in the construction industry

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$)) Industry 50%
 Govt 50%

Describe Nature/objectives of Research
 Use of CR & work improvement techniques in construction

Research Facilities (Describe briefly if any) No special facilities

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. Separate instructions will follow on procedures for submittal.

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(continued)

April 5, 1979

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Name of Institution Middle East Technical University
Faculty/School Faculty of Engineering, Department of Civil Engineering,
Address Division of Construction Strategy., Ankara, TURKEY

Name, Title of Contact Dr. D. Arslan, Asst. Prof. of Civil Eng., Head of the Division
Name, Title of Responder of Construction Strategy

Programme/s offered Degree Degree Non-dg. Non-dg. Part of Other
Bachelor Master Ph. D. Diploma Certificate Programme Specify

Year Programme Established 1967

Duration (years) - length of Programme 2 to 3.5

Availability (Indicate current student nos) Part-time

Full-time

Other (specify)

National

Year

Foreign

Admission Requirements

Course Requirements - list of courses needed & thesis/project

Scholarship, Fellowship

Bursaries, etc. available

Language of Instruction English

Total Numbers of Students Graduated

National 10 Foreign 1

Funding: Government

Industry

Other (specify)

Staff Numbers: Totals

(Indicate #s)

Industry Input

(Please tick)

Course, Titles, Descriptions

Indicate Text Title (if any)

Administration Scholarship Research

100 % 90 % 90 %

- 10 % 10 %

- - -

Faculty Full Time (2) Part time (2) Industry, Instructors, Speakers (2)

Financial Administrative () Curriculum Development

Scholarship, Bursaries, etc (X) Overseeing Body Industry Liaison (X)

(CE 231, Engineering, Economy (At undergraduate level)

2. CE 432, Construction Engineering and Management

(At undergraduate level)

(continued)

3. CE 434, Construction Planning

4. CE 436, Forms and Scaffolding for Reinforced Concrete Structures.

5. CE 403, Construction Site Techniques.

6. CE 507, Application of Operational Research Methods Construction Management Problems.

7. CE 541, Introduction to Tunnel Construction.

Educational Programme Objectives: To produce Civil Engineers who are aware of the problems in the industry and who are well equipped for higher managerial posts.

Research (Please tick)

Organizational (Applied) : X Engineering (Hard) : X

Research Funding

(Indicate source & amount (US \$) None

Describe Nature/objectives of Research

Research is of the "Applied" type. Research projects generally bring a solution to a specific problem encountered at company level or industry level. The objective is to increase efficiency by the use of modern methods or adequate measures whenever problems arise.

Research Facilities

(Describe briefly if any) None

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

- The Application of Construction Planning, D. Sorguc, METU, 1975

- Laws and Contracts in Construction, D. Sorguc, METU, 1975

(X) Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

- 3. System analysis
- 4. Industrialized Building Systems
- 5. Building Law and Codes
- 6. Human Factors and Labour Relations

Educational Programme Objectives:

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$)) approx. 20,000.- / year

Describe Nature/objectives of Research

Research Facilities (Describe briefly if any) All research facilities of the Technon

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print) In Hebrew only

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

Name of Institution TECHNION - Israel Institute of Technology
 Faculty/School Faculty of Civil Engineering
 Address Technion City, Haifa 32-000, Israel

Name, Title of Contact Division for Construction Management
 Name, Title of Responder 1. Prof. S. Pe'er
 2. Prof. D. Armon

Programme/s offered Degree Bachelor Master Ph.D. Diploma Non-deg. Certificate Programme Other: Specify

Year Programme Established	1970	1970	--	--	B.Sc
Duration (years) - length of Programme	2	3			Civil.Eng.

Availability (Indicate current student nos) Part-time 20 5 ---
 Full-time -- -- 100
 Other (specify) ---

National Year Nat. Nat.
 Foreign

Admission Requirements B.Sc M.Sc.

Course Requirements - list of courses needed & thesis/project 10 + 3 +
 theses

Scholarship, Fellowship Bursaries, etc. available yes yes
 yes yes

Language of Instruction Hebrew

Total Numbers of Students Graduated National 40 Foreign ---

Administration Scholarship Research

Funding: Government: No separate funding
 (Indicate %) Industry
 Other (specify)

Staff Numbers: Totals Faculty Full Time (4) Part time (5) Industry, Instructors, Spoken (8)

Industry Input Financial Administrative () Curriculum Development
 (Please tick) Scholarship, Bursaries, etc () Overseeing Body Industry Liaison ()

Course, Titles, Descriptions Indicate Text Title (if any)

1. Building Economy

2. Cost estimating and control

(continued)

April 5, 1979

- 3. PROJECT ORGANISATION
Text "Project Organisatie"
- 4. FUNCTIONAL DESIGNING OR FACILITIES
Text "Functioneel ontwerpen"
- 5. ENGINEERING DESIGNING METHODS
- 6. SYSTEM DYNAMICS
Text "System Dynamics"

Name of Institution DELFT UNIVERSITY OF TECHNOLOGY
 Faculty/School DEPARTMENT OF CIVIL ENGINEERING, SECTION OF CONSTRUCTION AND MANAGEMENT
 Address STEVINWEG 1, DELFT, HOLLAND

Name, Title of Contact ir. D. W. Greven, M.Sc.
 Name, Title of Responder same
 Programme/s offered Baccalaureate Degree in Technology, Part of ~~Graduate~~ Programme
Master Ph. D. Diplomas ~~in Construction Management~~

Year Programme Established (Un. of. Tech. 1842)
 Duration (years) - length of Programme CONSTRUCTION & MANAGEMENT OPTION SINCE 1964.

Availability (Indicate current student nos)
 Part-time 10
 Full-time 80
 Other (specify)
 National 86
 Foreign 4

Admission Requirements GYMNASIUM B OR ATHENEUM B or equal

Course Requirements - list of courses needed & thesis/project
 Scholarship, Fellowship Dutch Bursaries for nationals
 Bursaries, et c. available

Language of Instruction Dutch

Total Numbers of Students Graduated in Civil Engineering Per Year	National		Foreign		10 AVERAGE per YEAR	
	25	25	10	10	AVERAGE	per YEAR
Funding: Government	100Z					
Industry						
Other (specify)						

Staff Numbers: Totals (Indicate #s)
 Faculty Full Time (3) Part Time (5) Industry, Instructors, Speakers (4)

Industry Input (Please tick)
 Course, Titles, Descriptions
 Indicate Text Title (if any)
Administrative () Curriculum Development (x)
Scholarship, Bursaries, et c. () Overseas Body Industry Liaison (x)
Proudling Thesis Proj. (x) Joint research (x)

- 1. The organisation of the building process
Text "De organisatie van het bouwen"
- 2. Costing of Civil Engineering Projects
Text. "Namen van kosten"

(continued)

Educational Programme Objectives: The construction option provides knowledge and working skills for the construction, organisation and management of building- and civil engineering projects.

Research (Please tick)
 Organizational (Applied) (X) Engineering (Hard) (X)

Research Funding (Indicate source & amount (US \$) est. government funding of \$ 90.000.-- p.u.

- Describe Nature/objectives of Research
- 1) Planning of the building process
 - 2) Construction company-designer intergration
 - 3) Pre design of industrial facilities
 - 4) Computer aided civil engineering design

Research Facilities (Describe briefly if any)
 1) offices
 2) co-usage of IBM 370-158

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print) Test books of courses, thru 6 (in Dutch)

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

April 5, 1979 WATERLOO CONSTRUCTION CHURCH

Name of Institution: Department of Construction Management
 Faculty, School: The Technical University of Denmark
 Address: Build. 115, 2800 Lyngby (Copenhagen), Denmark, Europe

JUN 06 1979

UNIVERSITY OF WATERLOO

Name, Title of Contact: AXEL GAARSLEV
 Name, Title of Responder: STEEN LICHTENBERG

Programme/s offered: Degree / Degree Non-deg. Part of Other:
 Bachelor / Master / Ph. D. Diploma Certificate Programme Specify

Year Programme Established: 1967 1970
 Duration (years) - length of Programme: 5-6 2-3

Availability (Indicate current student nos):
 Part-time: abt. 100
 Full-time: 12 1
 Other (specify): 12 2
 0 0

National Year 1978: 0 0

Admission Requirements: 1) 2)

Course Requirements - list of courses needed & thesis/project
 Scholarship, Fellowship
 Bursaries, etc. available

1) High school diploma, Danish Language of Instruction
 2) Masters Degree

Total Numbers of Students Graduated: National Foreign

Funding: (Indicate %)	Government	Administration	Scholarship	Research
	Industry	X	X	X
Other (specify)				

Staff Numbers: Totals (Indicate \$): Faculty Full Time (6) Part time (2) Industry, Instructors, Speakers

Industry Input (Please tick): Financial Administrative () Curriculum Development
 Scholarship, Bursaries, etc () Overseasing Body Industry Liaison ()

Course, Titles, Descriptions Indicate Text Title (if any)

1. Main Title (all): "Construction Management"
 1. Basic

2. Production methods, Equipment

(continued)

3. Economy

4. Contracting, Estimating

5. Planning methods, implementation and control

6. Organizational sociology

Educational Programme Objectives:

Research (Please tick): Organizational Applied (X) Engineering (hard)

Research Funding

(Indicate source & amount (US \$): University and govern. funds equivalent To abt. four qualified persons.

Describe Nature/objectives of Research

Basic and applied research in the field of Construction Management

Research Facilities

(Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submital).

April 5, 1979

3. Construction Management II
Description : See attached list
4. Text : Various books in Turkish and in language of each student as his second language (mostly English)
- 5.
- 6.

Chair of Construction Management
Technical University of Istanbul
Faculty of Civil Engineering
I. T. Ü., İnşaat Fakültesi, Yapı İşletmesi Kürsüsü, Taşkışla
Istanbul / Turkey

Name, Title of Contact
Name, Title of Respondee
Prof. Dr.-Ing. V. Dogan Sorguç

Programme/s offered Degree Degree Non-deg. Non-deg. Part of Other:
Bachelor Master Ph.D. Diploma Certificate Programme Specify

Year Programme Established 1977 Planned^x 1977 Planned^{xx}
Duration (years) - length of 3 Courses 1.5 Duration 1 year
Programme in C.E. years depends on
Availability (Indicate current education thesis.
student nos) ~~Research~~ diploma-project
Full-time 50 (attended courses above
Other (specify) mentioned only)

National Year 45 1979
Foreign 5

Admission Requirements Prerequisite :
Course Requirements - list of "Construction Management II"
courses needed & thesis/project

Scholarship, Fellowship General scholarships
Bursaries, etc. available available to C.E. students

Language of Instruction Turkish

Total Numbers of Students Graduated National 7 Foreign
(Students who have received B.S. degree in Construction Management)

Funding: Government 100% Scholarship 100%
(Indicate %) Industry Negligible 100%
Other (specify) Starting

Staff Numbers: Totals Faculty Full Time (6) Part time (1) Industry, Instructors, Speakers (1)
(Indicate %s) (2 Prof., 4 Assistants)

Industry Input Financial Administrative () Curriculum Development^x
(Please tick) Scholarship, Bursaries, etc () Overseeing Body Industry Liaison^Y)

Course, Titles, Descriptions^x Planned development related with X and XX above
Indicate Text Title (if any)

1. Introduction to construction equipment.
Description : See attached list
Text : "Yapı Makinaları" Prof. S. Ersoy (3 volumes)
2. Construction Management I
Description : See attached list
Text : Notes and various books in Turkish (continued)

Educational Programme Objectives: To-day's objective : Basic education of C.E. students in Construction Management and practical training in construction industry through diploma-project considering the subjects of the basic education.
Future objective : Training of managers and businessmen of the Construction Sector.

Research Organizational (Applied) (x) Engineering (Hard) ()
(Please tick)

Research Funding Technical and Scientific Research Council of Turkey (1 project)
(Indicate source & amount: /US \$) 4.000 US \$

Describe Nature/objectives of Research Research works are being yet carried out for the acquisition of academic degrees (Ph.D.) and oriented to solve the practical problems of the construction sector and industry like developing cost control systems in Turkish conditions, revising safety regulations analysing accidents in sites, developing a uniform model of project analysis, cost and finance minimisation etc...

Research Facilities Computer System Burroughs 3700
(Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

- Laws and Contracts in (Turkish) Construction Assoc. Prof. Dr.-Ing. V. Dogan Sorguç
bookstore of the Middle East Technical University Ankara, Turkey (in English)
- Construction Equipment (3 Volumes - in Turkish Prof. Dr.-Ing. Sedat Ersoy
bookstore of the Technical University of Istanbul
- Project Management Techniques in Construction Prof. Dr.-Ing. V. Dogan Sorguç

(x) Please check if interested in having above [listed in National technical information service for world wide distribution. (Separate instructions will follow on procedures for submittal).

Note : For remarks X, XX, see please : "Development of Construction Education Programme in Turkey". Assoc. Prof. Dr. V. Dogan Sorguç - CIB W-85 II. International Symposium on Organisation and Management in Construction. Technion (Haifa) October 1978 (Vol V)

Name of Institution THE UNIVERSITY OF NEW SOUTH WALES
 Faculty/School FACULTY OF ENGINEERING, SCHOOL OF CIVIL ENGINEERING,
 Address DEPARTMENT OF ENGINEERING CONSTRUCTION AND MANAGEMENT,
 Box 1 P. O. KENSINGTON, N.S.W. 2033. AUSTRALIA
 Name, Title of Contact Professor Ronald W. WOODHEAD, Professor of Civil Engineering,
 Name, Title of Responder Head, Department of Engineering Construction and Management

Programme/s offered	Degree	Degree	Non-deg.	Non-deg.	Part of	Other:
	Bachelor	Master	Ph.D.	Diploma	Certificate	Programme Specify
Year Programme Established	1973	1964	1951	-	-	-
Duration (years) - length of Programme - Construction Studies as % (21%)	4 yrs	1 yr	3 yrs	-	-	-
Availability (Indicate current student nos)	51	46	3	-	-	-
Part-time	420	-	-	-	-	-
Full-time	-	-	-	-	-	-
Other (specify)	-	-	-	-	-	-
National	-	-	-	-	-	-
Foreign	-	-	-	-	-	-
Admission Requirements	University Matriculation	First Degree	Hons First Degree	-	-	-
Course Requirements - list of courses needed & thesis/project	-	-	-	-	-	-
Scholarship, Fellowship	-	-	-	-	-	-
Bursaries, etc. available	-	-	-	-	-	-

see Faculty Handbooks
NOT RECEIVED!

Language of Instruction	ENGLISH		
Total Numbers of Students Graduated	National	Foreign	
Funding: Government	Administration	Scholarship	Research
(Indicate %)	100%	100%	100%
Industry	-	-	-
Other (specify)	-	-	-
Staff Numbers: Total: Engin- (Indicate #s)	Department of Engineering Construction & Management	Full Time (9)	Part time (-)
Industry Input (Please tick)	Financial Administrative ()	Curriculum Development	Industry Liaison (X)
Course, Titles, Descriptions (Indicate Text title (if any))	Scholarship, Bursaries, etc ()	Overseeing Body	Industry Liaison (X)

Course, Titles, Descriptions - Not applicable - see Faculty Handbooks (enclosed)

- 1.
- 2.

(continued)

Educational Programme Objectives: An integrated continuous training programme over four years at the undergraduate level followed by one year of specialisation in various aspects of construction and management at the Masters Degree level

Research (Please tick) Organizational (Applied) (✓) Engineering (Hard) (✓)

Research Funding Australian Research Grants Committee
 (Indicate source & amount (US \$)) Two Projects (see below) \$72,000 U.S.

Describe Nature/objectives of Research
 Project No. 1: (\$48,000) The Influence of Layout and Management of Policies on the Productivity of Material Flow Processes on Construction Sites. (Professor R.W. Woodhead)
 Project No. 2: (\$24,000) Factors Affecting Performance and Production of Modern Heavy Duty Blasthole Drills on Construction Sites. (Professor J.M. Antill and Mr. V. Summersby)

Research Facilities (Describe briefly if any)
 (a) Construction Assembly Laboratory with access to Heavy Structural Testing Bay.

(b) Construction Project Laboratory equipped as a planning and estimating library

(c) Simulated Field Exercises - various Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

A.S.Hall and R.W. Woodhead. Frame Analysis, John Wiley & Sons, Ins, New York. 1st Edition 1961, Japanese edition 1966, 2nd edition 1967.
 J.M. Antill and R.W. Woodhead, Critical Path Methods in Construction Practice, John Wiley & Sons, Ins, New York, 1st ed 1965, Spanish ed 1968, French ed 1968, Portuguese Ed 1968, 2nd ed. 1970.
 D.D. Meredith, K.W. Wong, R.W. Woodhead and R.H. Wortman, Design and Planning of Engineering Systems, Prentice-Hall Inc, New Jersey, 1972.
 D.W. Halpin and R.W. Woodhead, CONSTRUCTO - A Heuristic Game for Construction Management, University of Illinois Press, 1973, Romanian trans 1973.
 D.W. Halpin and R.W. Woodhead, Design of Construction and Process Operations, John Wiley & Son Inc, N.Y., 1976.

(✓) Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submitfol).
 * J.M. Antill, Civil Engineering Management, Angus & Robertson, Sydney, 1st ed 1970, 2nd ed. (Metric) 1973
 J.M. Antill and P.W.S. Ryan, Civil Engineering Construction, Angus & Robertson, Sydney, 1st ed 1957, 2nd ed 1965, 3rd ed 1967, 4th ed (Metric) 1974.

3. (Master's and Ph.D degrees are obtained by research rather than taught courses)
- 4.
- 5.
- 6.

Name of Institution University of Liverpool
 Faculty/School Department of Building Engineering,
 Address P.O. Box 147, Liverpool L69 3BX.

Name, Title of Contact Mr. B. Whitehead,
 Name, Title of Respondent Senior Lecturer

Programme/s offered Degree Non-Dip Non-Dip Part of Other
 Bachelor Ph.D. Diploma Certificate Programme Specify

Year Programme Established 1965
 Duration (years) - length of Programme 3 2 3
 Availability (Indicate current student nos) Part-time - Full-time 72 4 2
 Other (specify)
 National Yr. 1=10, 2=18, 3=16, Yr. 3 1
 Foreign Yr. 1=12, 2=7, 3=9, Yr. 1=3, Yr. 5 1
 Admission Requirements Degree: - 3 GCSE A Level + English Language Ph.D. + Good Honours Degree (All register first for Master's then transfer. if recommended to Ph.D.)
 Course Requirements - list of courses needed & thesis/project - As per syllabus
 Scholarship, Fellowship Bursaries, etc. available A few undergraduate scholarships and postgraduate studentships are available.

Educational Programme Objectives: To produce graduates capable of improving standards in, and acceptable to, the building construction and services engineering industries.

Research (Please tick) Organizational (Applied) (✓) Engineering (Hard) (✓)
 Research Funding Science Research Council - approx. \$50,000 p.a.
 (Indicate source & amount (US \$) for academics.)

Describe Nature/objectives of Research
Acoustics - problems of structure-borne sound transmission in buildings
Materials - curing of cement pastes
Management - layout planning of building spaces

Research Facilities (Describe briefly if any)
 Controlled environment room
 Acoustic suite
 Materials Laboratory

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)
 (all publications in journals).

(✓) Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

Language of Instruction English
 Total Numbers of Students Graduated National 20* Foreign 8* * Average each year

Funding (Indicate %)	Government	Industry	Other (specify)	Administration	Scholarship	Research
	80%	5%	15%			25%

Staff Numbers: Totals (Indicate %)
 Part-time (0) Full-time (0) Industry, Instructors, Speakers () Occasional

Industry Input (Please tick)
 Financial Administrative () Curriculum Development
 Scholarship, Bursaries, etc () Overseasing Body Industry Liaison ()

Course, Titles, Descriptions Indicate Text Title (if any)
 1. Building Construction Engineering) Undergraduate courses
 2. Building Services Engineering)
)
)

(continued)

April 5, 1979

Name of Institution Institut für Baingeburwesen IV, Tunnelbau und Baubetriebslehre
 Faculty/School Technische Universität München
 Address Arcisstrasse 21, 8000 München 2, Fed. Rep. Germany

Name, Title of Contact Prof. G. Burkhardt
 Name, Title of Responder Prof. A. Schub

Programme/s offered Degree Bachelor Non-deg. Certificate Part of Other:
 Bachelor Master Ph.D. Diploma Programme Specify
 Since 1965

Year Programme Established Since 1930
 Duration (years) - length of 2 years
 Programme
 Availability (Indicate current 200 50
 student nos) Part-time
 Full-time
 Other (specify)
 National Year 2 1
 Foreign
 Admission Requirements Bachelor Bachelor
 Course Requirements - list of 7 Courses 11 Courses
 courses needed & thesis/project
 Scholarship, Fellowship No No
 Bursaries, etc. available

Language of Instruction German
 Total Numbers of Students Graduated National 700 Foreign 50
 in Specialization Administration Scholarship Research

Funding: Government 100%
 Industry -
 Other (specify) German Research Foundation (DFG) 20%
 Faculty Full Time (8) Part time (-) Industry, Instructors, Speakers (-) 10%

Staff Numbers: Totals
 (Indicate \$s)
 Industry Input
 (Please tick) Financial Administrative () Curriculum Development
 Course, Titles, Descriptions Scholarship, Bursaries, etc () Overseeing Body Industry Liaison ()
 Indicate Text Title (if any)

1. Construction Management: Scheduling, Estimation,
 System Engineering etc.
 2. Technology and Equipment: Constructions of Concrete,
 Earthmoving, Tunneling etc. (continued)

3. Legal Aspects

4. Project Management

5. Economics

6. Operations Research

Educational Programme Objectives:

Research (Please tick) Organizational (Applied) (x) Engineering (Hard) (x)

Research Funding (Indicate source & amount (US \$) \$ 50 000, - Government, Industry and DFG

Describe Nature/objectives of Research
 Stochastic Influences of Time and Cost by uncertain Activities in Construction.

Research Facilities (Describe briefly if any)
 Four Research Assistants, Terminal with CDC-Computer

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

3. Civil Engineering Project - none
4. Specifications and Estimating Means Cost Data Handbook
5. Contract Law and Labour Relations by Simythe and Sobermann
6. Construction Management - none

Educational Programme Objectives:

Research (Please tick) Organizational (Applied) (✓) Engineering (Hard) (✓)

Research Funding (Indicate source & amount (US \$)) N.R.C. \$20,000 yearly

Describe Nature/objectives of Research To develop new techniques of scheduling and cost control on construction projects

Research Facilities (Describe briefly if any) Computers and various testing laboratories

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

Construction Performance Control by Networks, H.N. Ahuja. Published by John Wiley and Sons.
 Successful Construction Cost Control, H.N. Ahuja. Published by John Wiley and Sons. (In Press).

(✓) Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

Name of Institution Memorial University of Newfoundland
 Faculty/School Faculty of Engineering and Applied Science
 Address

Name, Title of Contact Hira AHUJA, Prof. John CHRISTIAN, Dr.
 Name, Title of Responder Hira AHUJA, Prof. John CHRISTIAN, Dr.

Programme's offered Degree Bachelor Degree Non-deg. Non-deg. Part of Other:
 Bachelor Master Ph.D. Diploma Certificate Programme Specify

Year Programme Established 1969
 Duration (years) - length of Programme 4 1/2

Availability (Indicate current student nos) Part-time Full-time Other (specify)
 20

National Year 17
 Foreign Year 3

Admission Requirements Junior Division
 Course Requirements - list of Engineering Project Planning courses needed & thesis project Civil Engineering Project
 Scholarship, Fellowship Specifications and Estimating
 Bursaries, etc. available Contract Law and Labour Relations
Construction Courses within Civil Engineering Program

Language of Instruction English

Total Numbers of Students Graduated 160 National Foreign 10

Funding: Government	Administration	Scholarship	Research
Indicate %	100%	100%	100%
Other (specify)			

Staff Numbers: Totals Faculty Full Time (45) Part time (5) Industry, Instructors, Speakers (6)
 Indicate #'s All Engrg.

Industry Input Financial Administrative () Curriculum Development
 Scholarship, Bursaries, etc (✓) Overseeing Body Industry Liaison ()

- Course, Titles, Descriptions Indicate Text Title (if any)
1. Engineering Project Planning (Construction Performance Control) by Networks by H.N. Ahuja
 2. Construction Equipment and Methods (Construction Planning, Equipment and Methods by Peurifoy (continued)

April 5, 1979

Name of Institution: DEPARTMENT OF CIVIL ENGINEERING, UNIVERSITY OF TORONTO
Faculty/School: TORONTO, MESSIAH, CANADA

Name, Title of Contact: GEORGE S. BIRRELL, ASSOCIATE PROFESSOR

Programme's offered: Degree Bachelor, Master, Ph.D., Diploma, Certificate, Programme, Other
M.Sc. M. Eng 1977
NONE SO FAR ENTRANCE = M.Sc AT TORONTO

Year Programme Established: FULLTIME = 1 1/2 YEARS PARTTIME = 2 YEARS M.A.
Duration (years) - length of Programme: APPROX 20 APPROX 2
Availability (Indicate current student nos): Part-time, Full-time, Other (specify)
National Foreign: M. Eng = CLASSES + RESEARCH WORK M.Sc. = CLASSES + RESEARCH WORK THESIS

Admission Requirements: UNIV. OF TORONTO ACADEMIC MASTERS LEVEL BY GRAD. COURSE
Course Requirements - list of courses needed & thesis/project: TOTAL 24 COURSES EQUIVALENT MIN 4 COURSES IN CONSTRUCTION MAY 2 COURSE THESIS MAY 2 COURSE SPECIAL STUDY TOPIC VERY FEW
Scholarship, Fellowship, Bursaries, etc. available

Language of Instruction: ENGLISH
Total Numbers of Students Graduated: National, Foreign, Administration, Scholarship, Research

Funding: Government, Industry, Other (specify) UNIVERSITY OF TORONTO 100%
Staff Numbers: Totals Faculty Full Time (3) Part time (2) Industry, Instructors, Speakers () TECHNICAL ASSISTANTS

Industry Input (Please tick) NONE
Course, Titles, Descriptions: Financial Administrative () Curriculum Development Scholarship, Bursaries, etc () Overseas Body Industry Liaison () SOME DISCUSSIONS ETC. AS SUITABLE

Course, Titles, Descriptions Indicate Text Title (if any):
1. CIV 1051 CONCRETE CONSTRUCTION THE INGREDIENTS, MAKING AND PLACING CONCRETE
2. CIV 1075 BUILDING SCIENCE SCIENTIFIC STUDY OF A BUILDING AS AN END PRODUCT IN RELATION TO ITS ENVIRONMENT (continued)

- 3. CIV 1076 PROJECT MANAGEMENT AN OVERVIEW OF MANAGING A WHOLE PROJECT
- 4. CIV 1077 CONSTRUCTION ESTIMATING PROCESSES OF COST ESTIMATING FOR CONSTRUCTION WORK
- 5. CIV 1078 PLANNING & CONTRIBUTING CONSTRUCTION TECHNIQUES AND CONSIDERATIONS IN MANAGING THE CONSTRUCTION PROJECTS
- 6. CIV 1079 CONSTRUCTION CONTRACT DOCUMENTS INGREDIENTS OF THE CONTRACTUAL PACKAGE AND LEGAL ASPECTS IN CONSTRUCTION

Educational Programming Objectives: TO EDUCATE PEOPLE IN ESSENTIALS OF MANAGEMENT OF CONSTRUCTION, BE THEY FUTURE MANAGERS OR DESIGNERS OR OWNERS AGENTS

Research (Please tick) Organizational (Applied) (X) Engineering (Hard) (X)

Research Funding (Indicate source & amount (US \$) - SOME OPERATING GRANTS FROM CANADIAN GOVERNMENT RESEARCH AGENCY

Describe Nature/objectives of Research: TO EXAMINE HEURISTIC CONCEPTS IN THE MANAGEMENT ACTIVITIES, FUNCTIONS AND ORGANISATIONS IN THE CONSTRUCTION PROCESSES

Research Facilities (Describe briefly if any): TORONTO HAS A LARGE COMPETENT HEAVY CONSTRUCTION INDUSTRY AS A LABORATORY

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)

() Please check if interested in having above listed in National Technical Information Service for world wide distribution. (Separate instructions will follow on procedures for submittal).

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April 5, 1979

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Name of Institution Federal Institute of Technology (Polytechnic Institute)
Faculty/School Institute for Construction-Planning and Management (Architecture)
Address 8093 Zurich Hinggerberg

Name, Title of Contact Prof. Dr. A. Poppi (Chairman), Prof. Dr. C. H. Walz

Name, Title of Respondent
Programme/s offered Bachelor Degree Non-deg. Non-deg. Part of Other:
Master Ph.D. Diploma Certificate Programme Specify

Year Programme Established
Duration (years) - length of Programme 4
Sept 1979

Availability (Indicate current student nos) Part-time 8-10 in investigation, 80 in total semester
Other (specify)

National Year
Foreign

Admission Requirements High school
Course Requirements - list of courses needed & thesis/project
Scholarship, Fellowship Low on by
Bursaries, et c. available

Language of Instruction German
Total Numbers of Students Graduated National 90% Foreign 10%

Funding: Government
Industry
Other (specify) Administration total Scholarship total Research 70% support 30%

Staff Numbers: Totals Prof. 2 Faculty Full Time () Part time () Industry, Instructors, Speakers ()
(Indicate %s) 2 hours to 9 (6 full time, 3 part time.)
Industry Input Financial Administrative () Curriculum Development
(Please tick) Scholarship, Bursaries, etc () Overseeing Body Industry Liaison ()

Course, Titles, Descriptions of our specialisation
Indicate Text Title (if any) 1. heavy construction
2. site planning, equipment & management

(continued)

3. construction materials
 4. construction from management
 5. project management
 6. financial and cost accounting & control
 7. advanced OR and statistics in construction
- for all universities: 8. engineering economy
Educational Programme Objectives: basic applied OR and statistics in construction

Research (Please tick) Organizational (Applied) () Engineering (Hard) ()

Research Funding (Indicate source & amount (US \$)) Government & industry varying with pay

Describe Nature/objectives of Research
new training: - management system on building sites
- financial model for investment policy of companies
- project management of big projects

Research Facilities (Describe briefly if any)

Publications by Programme - only those that can be purchased (do not list articles in publications or out of print)
Computer programmes available
1) operations with big numbers include calculations with Zimpler's Input & put records
2) action & calculation with Zimpler and 1 inflation table

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