319.1 (1932-33)

Department of Tactics

Major C. C. Gee, C. E., Director and Instructor
Captain H. A. Buckley, Cav. (DOL), Instructor
Captain Robert J. Hoffman, Inf. (DOL), Instructor

Department of General Instruction

Lt. Col. L. V. Frazier, C. E., Director and Instructor
Major L. W. Miller, C. E., Instructor
1st Lt. C. H. Chorpening, C. E., Instructor

Department of Extension Course of the Engineer School

Lt. Col. L. V. Frazier, C. E., Director
Captain A. C. Lieber, jr., C.E., to February 27, 1933
1st Lt. Robert G. Lovett, C.E., since February 27, 1933
1st Lt. Miles Reber, C.E., to August 25, 1932
1st Lt. Gordon E. Textor, C. E., from August 26, 1932 to May 23, 1933.

Board on Preparation of Engineer Training Regulations

Lt. Col. L. V. Frazier, C.E., President
Captain A. C. Lieber, jr., C.E., to February 27, 1933
1st Lt. Robert G. Lovett, C.E., since February 27, 1933
1st Lt. Miles Reber, C.E., to August 25, 1932
1st Lt. Gordon E. Textor, C.E., from August 26, 1932 to May 23, 1933.

Department of Enlisted Specialists School

1st Lt. Herbert B. Loper, C.E., Senior Instructor
1st Lt. G. C. Reinhardt, C. E., Instructor
M. Sgt. F. H. Bloom, ESD(W), Instructor in Map Reproduction and Photography
M. Sgt. John Heitmann, ESD(W), Instructor in Surveying and Drafting
M. Sgt. G. M. Follis, ESD(W), Instructor in Map Reproduction and Photography
T. Sgt. J. H. Bakewell, ESD(W), Instructor in Surveying and Drafting
S. Sgt. F. H. Schulte, ESD(W), Instructor in Surveying and Drafting
T. Sgt. C. Laird, ESD(W), Instructor in Map Reproduction and Photography
Sgt. C. L. Harris, ESD(W), Instructor in Photography
Sgt. S. P. Howard, ESD(W), Instructor in Automotive & Electrical Engineering
Sgt. R. E. Fennel, ESD(W), Instructor in Lithography
Sgt. D. C. Carmichael, ESD(W), Instructor in Water Purification Unit
Corp. J. R. Wynne, ESD(W), Instructor in Automotive Engineering
Corp. W. W. Holland, ESD (W), Instructor in Photography

HEADQUARTERS THE ENGINEER SCHOOL

OFFICE OF THE COMMANDANT

EHS/d

319.1 AG (Engr. School)-33

In reply refer to: Fort Humphreys, Va.

319.1 July 8, 1933

3 unk'd. incls. acc.

Subject: Report of Operations of the Engineer School for the School Year 1932-1933.

To: The Adjutant General, Washington, D. C. (Through The Chief of Engineers, Washington, D. C.)

1. The following report is submitted in compliance with paragraph 3 c(2)(a), AR 350-110.

2. The activities of the Engineer School comprise:

a. Conduct of the Company Officers Course.
b. Conduct of the National Guard and Reserve Officers Course.
c. Conduct of the Enlisted Specialists Course.
d. Preparation of the Extension Course of the Engineer School.
e. Preparation of the Conference Course in Military Engineering for National Guard and Reserve Officers throughout the country.
f. Preparation of the Conference Course in Military Engineering for Engineer R.O.T.C. units throughout the country.
g. Operation of official mailing list, a Book Department, and the dissemination of information concerning recent developments in military engineering.
h. Preparation of Engineer Training Regulations and review and recommendation as to certain training regulations prepared by other branches.
i. Special studies concerning organization, duties, and functions of special engineer units.

3. THE STAFF OF THE SCHOOL was as follows:

Colonel Edward H. Schulz, C. E., Commandant
Lt. Colonel Laurence V. Frazier, C.E., Assistant Commandant
Major Wm. E. R. Covell, C.E., Executive Officer to May 6, 1933.
Major Edwin A. Bethel, C.E., Executive Officer since May 6, 1933.
1st Lt. C. H. Chorpening, C.E., Secretary.

Department of Civil and Military Engineering

Lt. Col. R. T. Coiner, C.E., Director and Instructor to Dec. 2, 1932.
Major P. S. Reinecke, C.E., Director and Instructor since Dec. 2, 1932.
Major B. B. Browne, C.E., Instructor
Major L. W. Miller, C.E., Instructor
Captain Wm. N. Thomas, jr., C.E., Instructor
1st Lt. H. B. Loper, C.E., Instructor

4. THE COMPANY OFFICERS COURSE commenced on September 2, 1932, covering the subjects and scope as given in Appendix I. The class comprised 22 officers, including -

1 Captain, Corps of Engineers
5 First Lieutenants, Corps of Engineers
14 Second Lieutenants, Corps of Engineers
2 Lieutenants, Siamese Army

On May 22, 1933, the course was terminated and graduation exercises held. All students satisfactorily completed the course and were awarded diplomas. Their names are listed below in order of class standing:

1. 1st Lt. William C. Baker, jr., C.E.
2. 2d Lt. Rudolph E. Smyser, jr., C.E.
3. 2d Lt. Horace F. Sykes, jr., C.E.
4. 2d Lt. James L. Green, C.E.
5. 2d Lt. Frederick J. Dau, C.E.
6. 2d Lt. Raymond L. Hill, C.E.
7. 1st Lt. Charles H. McNutt, C.E.
8. 1st Lt. Joseph W. Cox, jr., C. E.
9. 2nd Lt. Raphael B. Ezekiel, C. E.
10. 2nd Lt. Francis H. Falkner, C. E.
11. 2nd Lt. Frank H. Forney, C. E.
12. 2nd Lt. Thomas A. Lane, C. E.
13. 2nd Lt. Samuel R. Browning, C. E.
14. 1st Lt. Harry O. Paxson, C. E.
15. 2nd Lt. Alan J. McCutchen, C. E.
16. 2nd Lt. Lyle E. Seeman, C. E.
17. 2nd Lt. John L. Person, C. E.
18. Captain Russel McK. Herrington, D. C.
19. 1st Lt. Frank A. Pettit, C. E.
20. 2nd Lt. George A. Lincoln, C. E.
21. 2nd Lt. J. L. Chuan Chuen Kambhu, Siamese Army
22. 2nd Lt. Bun Mar Praband, Siamese Army

First Lieutenant Hugh J. Casey, C. E., was awarded a diploma in Civil Engineering per authority contained in 2d Indorsement, 201 Reg(Casey, Hugh J.)7, Office, Chief of Engineers, November 30, 1932.

Colonel Edward H. Schulz, C.E., was awarded a diploma per authority contained in 1st Ind., AG 352.08(5-4-33), Off Div WD AGO, May 19, 1933.

Major General Lytle Brown, The Chief of Engineers, delivered the graduation address and presented the diplomas to both the Company Officers Class and the National Guard and Reserve Officers Class.

5. THE NATIONAL GUARD AND RESERVE OFFICERS COURSE commenced on March 3, 1933 and terminated May 22, 1933, when graduating exercises were held. The course covered the subjects and scope as shown in Appendix II. The class consisted of 37 officers of the National Guard and Corps of Engineers Reserve, distributed as follows:

Grade	N.G.	Engr-Res.	Total
Captains	5	10	15
1st Lieutenants	3	9	12
2d Lieutenants	2	8	10
Totals	10	27	37

All students satisfactorily completed the course except as noted below, and were awarded diplomas. Their names are listed below in order of class standing:

1. 2d Lt. Gordon W. McLeod, Engr-Res.
2. Captain John E. Soule, Engr-Res.
3. 2d Lt. George G. Smith, Engr-Res.
4. 2d Lt. Alvah E. Perkins, Engr-Res.
5. Captain Harrison D. Wilson, jr., Illinois N.G.
6. Captain Thomas E. Ormiston, Engr-Res.
7. 1st Lt. Albert W. Bruce, Engr-Res.
8. 1st Lt. Frank N. Sands, jr., Engr-Res.
9. 1st Lt. Walter C. Underwood, Engr-Res.
10. 1st Lt. James P. Hall, Missouri N. G.
11. 1st Lt. William S. Arrasmith, Engr-Res.
12. Captain Bernhard M. Dornblatt, Engr-Res.
13. 2d Lt. Donald E. Farr, Engr-Res.
14. Captain Leo R. Adams, Mass. N. G.
15. 2d Lt. Jack C. Baker, Engr-Res.
16. 1st Lt. Lothar C. Maurer, Engr-Res.
17. Captain Bernhard Gasser, Engr-Res.
18. Captain William H. Davis, Texas N. G.
19. 2d Lt. Charles E. Jung, Engr-Res.
20. 1st Lt. David I. Dodenhoff, Miss. N. G.
21. Captain James F. Hoffman, Engr-Res.
22. 1st Lt. Robert P. Breckenridge, Engr-Res.
23. Captain John B. Baker, New Mexico N. G.
24. 2d Lt. Norman D. Dole, Engr-Res.
25. Captain Herbert M. Stoll, Engr-Res.
26. 1st Lt. Raymond G. Plimpton, Engr-Res.
27. 1st Lt. Ralph S. Reynolds, Idaho, N.G.
28. Captain Russell E. Freeman, Engr-Res.
29. Captain Henry C. Willcox, Engr-Res.
30. Captain Earl M. Clawson, Engr. Res.
31. 1st Lt. George E. Edmonds, Engr-Res.
32. 2d Lt. Robert T. Fox, Rhode Island N.G.
33. 1st Lt. Andrew Malone, Engr-Res.
34. Captain Don Carlos Dubois, Engr-Res.

35. 2d Lt. Carl N. Wagner, Engr-Res.
36. 2d Lt. John W. Scott, New York N. G.

Captain Godfrey P. Keebler, Penn. N.G., failed to complete the course due to physical incapacity and was relieved upon his transfer to Walter Reed General Hospital, May 3, 1933.

6. THE ENLISTED SPECIALISTS SCHOOL was conducted from October 4, 1932 to May 19, 1933, and comprised three courses with subjects and scope as given in Appendix III. Thirty-seven (37) students were assigned to the school as shown by the following table:

Organization	T. Sgts.	S.Sgts.	Sgts.	Corps.	Pvts 1/c	Pvts.	Total
Engr Sch Det (W)		*1					1*
Engr Det USMA						1	1
Engr Det Hq I CA			1				1
1st Engrs				2	3	2	7
2d Engrs					2	1	3
6th Engrs			1		1	1	3
8th Engrs				2			2
9th Engrs					1		1
13th Engrs	1	*(1) 6	3	1	*1	4	16
FA		1				1	2
Totals	1	8	5	5	8	10	37

*Did not complete course.

Staff Sgt. Woldemar Krock, 6681727, ESD(W), was detailed to take the Surveying and Drafting Course December 1, 1932, in order to fit himself for duties as instructor in this course. He was relieved February 6, 1933, because it was not believed he would make a suitable instructor.

Staff Sgt. Kenneth M. Green, R-470314, Company B, 13th Engineers, was relieved from the Surveying and Drafting Course on March 16, 1933, due to illness which made necessary his transfer to Fitzsimmons General Hospital, Denver, Colorado.

Pvt 1/c Ernst Karweina, 6812020, H&S Company, 13th Engineers, was relieved from the Surveying and Drafting Class on November 22, 1932 because of lack of necessary qualifications to take the course.

Thirty-four students satisfactorily completed the courses and were awarded diplomas:

17 in Surveying and Drafting Class
7 in Map Reproduction and Photography Class
10 in Operators Course
34 total graduates

The names of the Enlisted Specialist students are listed below, by class, in order of final standing:

319.1 (1932-1933)

SURVEYING AND DRAFTING COURSE

	NAME	A.S.N.	RANK	ORGANIZATION
1	Inhelder, William	6540813	Sergeant	Co. D, 6th Engineers
2	Payne, Maurice R.	6211584	Pvt SP 3/C	Co. B, 29th Engineers
3	McLean, George	6510925	Staff Sgt	Co. A, 29th Engineers
4	Halseth, Alden E.	6617411	Pvt 1/c	Tr. A, 9th Engineer Squadron
5	Sargent, Frederick N.	6843313	Private	Co. B, 13th Engineers
6	Flaherty, William M.	6244524	Pvt 1/c	Co. C, 2d Engineers
7	Williams, Emory L.	6240854	Private	H&S Co, 2d Engineers
8	O'Hagerty, John F.	R-360961	Sergeant	Engr Det, Hq, 1st C.A.
9	Burgess, William O.	6361903	Corporal	H&S Co, 13th Engineers
10	Krystof, Thomas	6099012	Corporal	Co. D, 1st Engineers
11	Rodriquez, Regino	6727776	Sergeant	Co. D, 13th Engineers
12	Saunders, William	6683059	Corporal	Co. A, 1st Engineers
13	Dyson, Stephen L.	6344732	Staff Sgt	Co. F, 13th Engineers
14	Sadler, Lawrence E.	R-322173	Staff Sgt	Co. E, 13th Engineers
15	Holtzclaw, Everst A	6642955	Sergeant	Co. A, 13th Engineers
16	Lenvendosky, Charles L.	6700265	Pvt 1/c	Co. C, 1st Engineers
17	Bulcock, Benjamin	R-394344	Private	H&S Co, 1st Engineers

MAP REPRODUCTION AND PHOTOGRAPHY COURSE

1	Olson, Richard	6117236	Staff Sgt	Co. D, 13th Engineers
2	Lawshe, George M.	6536428	Pvt 1/c	H&S Co, 1st Engineers
3	Harrison, Robert P.	R-154937	Tech Sgt	H&S Co, 13th Engineers
4	Scherer, Andrew F.	6819354	Pvt 1/c	Co. C, 2d Engineers
5	Blochowicz, Ignacy	6452584	Staff Sgt	Co. A, 13th Engineers
6	Lafountaine, Arthur F.	6699142	Private	Engr Det, U.S.M.A.
7	Bates, Arthur L.	R-1021183	Staff Sgt	H&S Co, 13th Engineers

OPERATORS COURSE

1	Vaughn, John L.	6229208	Corporal	Tr B, 8th Engineer Squadron
2	Bailey, John J., jr.	6540949	Pvt 1/c	H&S Co, 6th Engineers
3	Thomas, Jesse D.	6025162	Pvt 1/c	H&S Co, 1st Engineers
4	Young, Charles W.	R-1274583	Sergeant	Co. A, 13th Engineers
5	Rokenbrod, Paul E.	6843248	Private	Co. F, 13th Engineers
6	McLaughlin, Eugene F.	6703360	Private	Co. C, 6th Engineers
7	Crum, Edward A.	6696323	Private	Co. C, 1st Engineers
8	Owens, Joseph	6232661	Corporal	Tr. A, 8th Engineer Squadron
9	Taylor, Foy	6839297	Private	Co. B, 13th Engineers
10	Gipple, Henry L.	6809340	Private	Co. D, 13th Engineers

7. THE EXTENSION COURSE DEPARTMENT OF THE ENGINEER SCHOOL AND THE BOARD ON ENGINEER TRAINING REGULATIONS.- a. During the period July 1, 1932 to May 23, 1933, two officers worked full time in connection with the revision of the Extension Courses of the Engineer School, preparation of a Conference Course for the National Guard and Reserve Engineer officers, and of a Conference Course for the Engineer R.O.T.C. units. On May 23, 1933 the staff in this department was reduced to one officer due to Lt. Textor's detail with the Civilian Conservation Corps. One officer is insufficient to carry on this work to best advantage.

b. Extension Course of the Engineer School.- During the period July 1, 1932 to February 15, 1933 two subcourses for the school year 1932-33 were revised and one special text written, in compliance with 6th Indorsement from The Adjutant General, file A.G. 352.6(2-16-32)Misc.(C). These subcourses were submitted, with the new special text, to the Chief of Engineers on the dates indicated below:

10-2, Organization and Duties of Engineers	February 1, 1933
Special Text No. 113	February 1, 1933
10-8, Map and Aerial Photograph Reading (Common Subcourse)	February 6, 1933

The revision program for the school year 1934-35 has been approved and includes the revision of 7 subcourses and the preparation of 4 special texts. These revisions are necessary to bring the subcourses up to date and make them conform to present organization and equipment. Unless an additional officer is made available for this work to replace Lt. Textor, this program of revision will probably have to be revised downward.

c. Conference Course for National Guard and Reserve Officers.- This Conference Course, started during the school year 1927-28, was turned over to the Extension Course Department of the Engineer School at the beginning of the school year 1931-32. During the past fiscal year distribution of material for 8 complete problems was made, without cost, to corps area engineers and instructors of National Guard and Organized Reserve units. The subjects of these problems were as follows:

Problem No. 1 Bivouacs
2 Duties of Engineers in an Advance (Map Maneuver - Battalion of the combat regiment)
3 Duties of Engineers in an Attack (Map Maneuver - Combat Company)
4 Water Supply
5 Engineer Supply (S-4 Staff Exercise)
6 Headquarters and Service Company (Combat Regiment - Map Maneuver)
7 Corps Engineer Force
8 Construction in War

It is contemplated that this service, extended by the school to instructors on Reserve Training duty, will be continued during the school year 1933-34. About 2500 students in all parts of the country are served by these problems. Reports received from instructors throughout the country indicate that the Conference Course is now a definite and valuable part of the inactive training for Engineer Reserve and National Guard officers. These instructors are practically unanimous in their opinion that this course should be continued.

d. Conference Course for R.O.T.C. Units.- During the school year 1931-32 the Extension Course Department of the Engineer School started a new Conference Course for Engineer R.O.T.C. Units. This Conference Course follows the same general plan used for the National Guard and Reserve Officers Conference Course, but contains more elementary material suitable for R.O.T.C. instruction. During the school year 1932-33 this Conference Course was continued and distribution of complete material for eight problems, as listed below, was made without cost to all Engineer R.O.T.C. Units, about 800 students being served:

Problem No.	1	Military Roads
	2	Infantry Rifle Platoon in the Attack
	3	Military Explosives and Demolitions
	4	Duties of Engineers in an Attack
	5	Military Bridges
	6	River Crossings
	7	Field Fortifications
	8	Duties of Engineers in a Defensive Situation

Instructors of various Engineer R.O.T.C. Units throughout the country report that these Conference Course problems fit in very satisfactorily with their instruction schedules and should be continued. It is contemplated that eight problems for R.O.T.C. units will be prepared and distributed during the school year 1933-34, if the situation with respect to instructor personnel permit.

e. The work of printing the two revised subcourses and one special text of the Extension Course, the eight National Guard and Reserve Officers Conference Course problems, and the eight R.O.T.C. Conference Course problems has been done at the Printing Plant of the Engineer School. In addition, reprints have been made of each of the following subcourses and special texts of the 1932-33 Extension Course program in the quantities indicated:

Subcourse		No. Copies
10-2	Organization and Duties of Engineers	500
20-1	Military Roads (2 parts)	1500
20-2	Military Bridging (3 parts)	1500
20-3	Explosives and Demolitions (2 parts)	1000
20-4	Mapping (3 parts)	1500
20-5	Tactics I (3 parts)	1000
20-6	Organization of the Ground I (2 parts)	1000
20-7	Field Fortifications (4 parts)	500

Subcourse		No. copies
30-9	Infantry Combat Principles (2 parts)	1,000
40-1	Traffic Circulation	1,000
40-2	Tactics III	500
40-3	Organization of the Ground III	500
40-4	Training Management	500
Special Texts		
108	Fixed and Floating Bridges	1,500
109	Mapping	1,500
111	Military Roads	1,500
112	Engineer Supply	500

f. The distribution of the Conference Course material for National Guard and Reserve Engineer officers and for R.O.T.C. units was handled by the Book Department of the Engineer School.

g. Board on Preparation of Engineer Training Regulations.- Due to the heavy demands in connection with the Extension Course, and the preparation of Conference Courses, no new training regulations were prepared during the past year.

8. REMARKS AND RECOMMENDATIONS.- The various courses as given at the school are considered as satisfactory in general, and to require only minor modifications.

The reduction in the authorized number of engineer staff and faculty at special service schools to twelve (12), in accordance with Table VIII of "Tables of Current Allotment of Officers," (AG 320.2 (7/26/32) Mis Ret-MA), will leave this school with insufficient instructor personnel. One of the twelve is on duty at Fort Benning with the Infantry School, leaving only eleven (11) for duty at Fort Humphreys. Deducting four (4) officers pertaining to post and school overhead, Commandant, Assistant Commandant, Executive Officer, and Secretary, leaves but seven (7) officers to conduct the instruction of The Company Officers and the National Guard and Reserve Officers Classes and also the Extension and Conference Courses for National Guard and Reserve Officers and the R.O.T.C. Six (6) engineer instructors are required for instruction of the Company Officers and the National Guard and Reserve Officers classes. Even with this number, it has been necessary for the Assistant Commandant and the Secretary to conduct part of the courses, the latter taking the equivalent of one full course. This will leave only one instructor for the Extension and Conference courses which are too extensive to be handled by one officer. An additional instructor by detail will be necessary, else the Conference Course for R.O.T.C. units must probably be discontinued. This course is considered of sufficient merit and importance to warrant continuance and the detail of an additional officer.

Edward H. Schulz

EDWARD H. SCHULZ,
Colonel, Corps of Engineers,
Commandant.

3 Incls.
(1) Appendix I (CO's Course)
(2) Appendix II (NGARO Course)
(3) Appendix III (Enlisted Specialists Courses)

HEADQUARTERS
THE ENGINEER SCHOOL
FORT HUMPHREYS, VIRGINIA

PROGRAM OF INSTRUCTION
NATIONAL GUARD AND RESERVE OFFICERS' COURSE, 1933
(Approved by 3d Ind., AG 352.01 (7-13-32) Misc. C dated 7-29-32.)

1. SCOPE.-

Subjects that will qualify National Guard and Reserve Officers to function intelligently with combat engineer units and as instructors in elementary military subjects; encouragement of military study.

2. DURATION OF COURSE.-

Three months - March 3, 1933 to June 2, 1933.

3. PROGRAM:

		Approximate Hours
I.	General Subjects.- The Army of the United States, emphasizing the functions and organization of the infantry division; the functions of the Corps of Engineers; customs of the service and military courtesy; demonstrations of engineer equipment; opening and closing exercises of the School.	12
II.	Training Management.- Training methods adapted to field service and also to conditions under which National Guard and Reserve officers serve in time of peace; engineer training programs and schedules; mobilization procedure.	18
III.	Staff and Supply.- Basic principles of staff organization and operations in small units; Class I supply of smaller units; establishment and maintenance of the divisional engineer dump and the engineer supply of a division.	45
IV.	Tactics and Technique of Associated Arms.- Organization, tactics, and combat principles of infantry to include the company, with a brief course in the battalion; organization of the ground; estimate of the situation and preparation and issue of oral and written orders; outlines of functions of associated branches.	110
V.	Animal Management and Equitation.- Theoretical and practical instruction in each subject.	40

		Approximate Hours
VI.	Drill and Command.- Practical instruction in close order drill to include the battalion and ceremonies; correct methods of giving commands; physical training methods. (This subcourse to be under the supervision of an officer on duty with the 13th Engineers.)	17
VII.	Map Reading and Military Sketching.- Theoretical and practical work in map reading and use of the compass. Types of military maps. Interpretation of aerial photographs. Use of the sand table. Practical work in military sketching and in use of aerial photographs in map making. Map reproduction, regimental equipment.	90
VIII.	Tactics and Technique of Engineers.- Organization, equipment and duties of engineer troops. Operations of combat engineers to include engineer reconnaissance, demolitions, military bridges, military roads, shelter and water supply, camouflage, mining and mine warfare; field fortification; use of engineer units in combat.	120
IX.	Musketry and Marksmanship.- Theory and effect of musketry fire; range determination; target designation, fire control; methods of instruction in rifle marksmanship and musketry; pistol marksmanship.	27

THE ENGINEER SCHOOL
FORT HUMPHREYS, VIRGINIA
COMPANY OFFICERS COURSE
1932-1933

PROGRAM OF INSTRUCTION
(Approved by The Secretary of War July 26, 1932)
(AG 352.01 (7-12-32) Misc. C)

I SCOPE.-

Tactics and technique of the engineer company covering all engineer activities, including periods allotted to the engineer battalion and regiment; infantry tactics and supply; combat principles of cavalry and artillery troop and battery units; duties of engineers on the staffs of divisions and higher units; duties of assistant district engineers in connection with the civil functions of the Corps of Engineers.

II DURATION OF COURSE.-

September 3, 1932 to June 2, 1933.

III PROGRAM.-

		Approximate Hours
1.	GENERAL SUBJECTS.- The Army of the United States, to bring out clearly the role and functions of each of the component elements; organization of the infantry division; outline of the War Department organization; military policy of the United States; industrial mobilization; opening and closing exercises of the School.	35
2.	TRAINING MANAGEMENT AND INSTRUCTIONAL METHODS.- Technique of teaching, including conduct of conferences and presentation of lectures; planning of troop training; engineer mobilization; problems confronting engineer officers on duty with National Guard, Organized Reserves, and R.O.T.C.; preparation of original map problems.	60
3.	COMMAND, STAFF AND LOGISTICS.- Basic principles of command and staff operation in units up to the division; basic principles of supply and of troop movements by marching, truck, and rail; traffic circulation and control; engineer supply for the infantry division; engineer depots.	100

Approx.
Hours

4. TACTICS AND TECHNIQUE OF ASSOCIATED ARMS.- 375
Organization, tactics, and combat principles of infantry to include the battalion and the howitzer company, with a brief course in the regiment; of field artillery, to include the battery; of cavalry, to include the troop; air corps functions, with demonstration at Langley Field, Virginia; Mechanized Force functions; organization of the ground; estimate of the situation; combat orders; a brief course in musketry; auxiliary weapons; fire problems.

5. ANIMAL MANAGEMENT AND EQUITATION.- 85
Animal draft, care of animals and stable management; equitation.

6. MILITARY HISTORY.- 60
Brief study of the principles of strategy; principles of historical research; Civil War and World War campaigns. (About 20 hours included under this subcourse are chargeable to Subcourse II, in that students are required to conduct the conferences and deliver the lectures connected with historical campaigns.) Inspections of Fredericksburg and Chancellorsville Battlefields.

7. MAP READING AND MAP MAKING.- 150
Practical work in map reading and map making; interpretation of aerial photographs; map reproduction; organization and execution of mapping projects; organization and use of engineer topographic units and of other engineer troops on mapping projects; planning and execution of mapping projects.

8. TACTICS AND TECHNIQUE OF ENGINEERS.- 250
Organization, equipment and duties of engineer troops; tactics and technique of engineer operations; engineer reconnaissance, military bridges; road construction, improvement, and maintenance; military railways; general construction, shelter and water supply, including landing fields, divisional camps and cantonments; camouflage; demolitions, mining and mine warfare; field fortifications. Cooperation between Air Corps and Engineers to be given special attention.

9. PERMANENT FORTS, NAVAL POWER, and COAST DEFENSE.- 100
Factors in land defense; permanent fortifications in World War; land defense in conjunction

Approximate Hours

with seacoast fortifications, including defense of beaches; naval power; effect of naval fire on shore defenses and vice versa; principles of harbor defense, including employment of artillery; seacoast fortification construction; inspection and demonstration of harbor defenses and permanent forts at Fort Monroe, Virginia.

10. RIVER AND HARBOR IMPROVEMENT.- 270
Hydrology; hydraulics; characteristics of rivers; river regulation and canalization; dredging, rock removal and snagging, flood protection, economics of waterway development; port facilities; waves, tides and currents; harbors; practical demonstration of harbor works; duties of the Engineer Department; law and court decisions, with special reference to federal contracts and laws relating to river and harbor work; cost accounting.

Total 1385

THE ENGINEER SCHOOL
FORT HUMPHREYS, VIRGINIA
COMPANY OFFICERS COURSE
1932-1933

PROGRAM OF INSTRUCTION
(Approved by The Secretary of War July 26, 1932)
(AG 352.01 (7-12-32) Misc. C)

I SCOPE.-

Tactics and technique of the engineer company covering all engineer activities, including periods allotted to the engineer battalion and regiment; infantry tactics and supply; combat principles of cavalry and artillery troop and battery units; duties of engineers on the staffs of divisions and higher units; duties of assistant district engineers in connection with the civil functions of the Corps of Engineers.

II DURATION OF COURSE.-

September 2, 1932 to June 2, 1933.

III PROGRAM.-

	Approximate Hours
1. GENERAL SUBJECTS.- The Army of the United States, to bring out clearly the role and functions of each of the component elements; organization of the infantry division; outline of the War Department organization; military policy of the United States; industrial mobilization; opening and closing exercises of the School.	35
2. TRAINING MANAGEMENT AND INSTRUCTIONAL METHODS.- Technique of teaching, including conduct of conferences and presentation of lectures; planning of troop training; engineer mobilization; problems confronting engineer officers on duty with National Guard, Organized Reserves, and R.O.T.C.; preparation of original map problems.	60
3. COMMAND, STAFF AND LOGISTICS.- Basic principles of command and staff operation in units up to the division; basic principles of supply and of troop movements by marching, truck, and rail; traffic circulation and control; engineer supply for the infantry division; engineer depots.	100

Job No. 7-33

Approximate Hours

4. TACTICS AND TECHNIQUE OF ASSOCIATED ARMS.- 275
Organization, tactics, and combat principles of infantry to include the battalion and the howitzer company, with a brief course in the regiment; of field artillery, to include the battery; of cavalry, to include the troop; air corps functions, with demonstration at Langley Field, Virginia; Mechanized Force functions; organization of the ground; estimate of the situation; combat orders; a brief course in musketry; auxiliary weapons; fire problems.

5. ANIMAL MANAGEMENT AND EQUITATION.- 85
Animal draft, care of animals and stable management; equitation.

6. MILITARY HISTORY.- 60
Brief study of the principles of strategy; principles of historical research; Civil War and World War campaigns. (About 20 hours included under this subcourse are chargeable to Subcourse II, in that students are required to conduct the conferences and deliver the lectures connected with historical campaigns.) Inspections of Fredericksburg and Chancellorsville Battlefields.

7. MAP READING AND MAP MAKING.- 150
Practical work in map reading and map making; interpretation of aerial photographs; map reproduction; organization and execution of mapping projects; organization and use of engineer topographic units and of other engineer troops on mapping projects; planning and execution of mapping projects.

8. TACTICS AND TECHNIQUE OF ENGINEERS.- 250
Organization, equipment and duties of engineer troops; tactics and technique of engineer operations; engineer reconnaissance, military bridges; road construction, improvement, and maintenance; military railways; general construction, shelter and water supply, including landing fields, divisional camps and cantonments; camouflage; demolitions, mining and mine warfare; field fortifications. Cooperation between Air Corps and Engineers to be given special attention.

9. PERMANENT FORTS, NAVAL POWER, and COAST DEFENSE.- 100
Factors in land defense; permanent fortifications in World War; land defense in conjunction

Approximate Hours

with seacoast fortifications, including defense of beaches; naval power; effect of naval fire on shore defenses and vice versa; principles of harbor defense, including employment of artillery; seacoast fortification construction; inspection and demonstration of harbor defenses and permanent forts at Fort Monroe, Virginia.

10. RIVER AND HARBOR IMPROVEMENT.- 270
Hydrology; hydraulics; characteristics of rivers; river regulation and canalization; dredging, rock removal and snagging, flood protection, economics of waterway development; port facilities; waves, tides and currents; harbors; practical demonstration of harbor works; duties of the Engineer Department; law and court decisions, with special reference to federal contracts and laws relating to river and harbor work; cost accounting.

Total 1385

THE ENGINEER SCHOOL
FORT HUMPHREYS, VIRGINIA
ENLISTED SPECIALISTS COURSES
1932-1933

I. The three courses for enlisted engineer specialists will be as follows:
   A. Drafting and Surveying
   B. Map Reproduction and Photography
   C. Operators.

II. Duration of Courses:
   November 1, 1932 to May 19, 1933, Courses B & C
   October 4, 1932 to May 19, 1933, Course A

III. Programs:
   A. Drafting and Surveying Course.- Hours

   1. Military Sketching - 139
   Sketching equipment, drafting equipment, sketching board traverse, symbols, contouring, area sketching, road sketching; with special emphasis placed upon the use of the airplane photo and airplane mosaic in rapid mapping, in the preparation of guide maps, and in the correcting of existing maps to include culture in actual existence. Determination of scales of airplane photographs. Contouring of airplane photographs in the office and in the field. Assemblage of mosaics and interpretation of photographs.

   2. Instrumental Surveying (S).- 294
   Use of chain, tape, leveling profiles, cross-sections, transit, plane table, azimuth determinations, and third order triangulation with care and adjustments of the various instruments used. The establishment of controls for airplane mosaics with the identification of the control points on flat, oblique, and multi-lens photographs.

   3. Geodesy and Astronomy (GA).- 59
   The determination of latitude, longitude, time and azimuth. The adjustment of quadrilaterals and computations of

III. Programs: A (Continued)

Hours

elevations by reciprocal observations; construction of polyconic projection for topographic maps and the study of the construction and development of grid systems, azimuth determinations for primary and third order triangulations. This section of the course is reserved for students who show aptitude and ability during the regular course.

4. Aerial Photographic Mapping (APM).- 202
Use of aerial photographs in mapping, particularly with respect to area sketching, road sketching, and photographic mosaics as an aid to correcting existing maps; determination of scales of airplane photographs, contouring of airplane photographs in the office and the field, interpretation and restitution of photographs.

5. Drafting and Tracing (D) 279
Lettering, conventional signs, map tracing, projections, preparation of field sheets, profiles and cross sections, planimeter, earth work computations, pantograph, drafting with special emphasis upon the rapid preparation of road and guide maps, based upon aerial photographs and mosaics. Revision of existing maps by means of aerial photographs to include existing culture and prominent features necessary for ease in map reading by the line troops.

6. Mathematics (M).- 78
Such practical applications of arithmetic, algebra, plane geometry and plane trigonometry as may be necessary to enable the student to perform the ordinary operations of mechanical drafting and usual field computations in surveying.

Total hours 1012

I. Programs: (Continued)

B. Map Reproduction and Photography Course.-

1. Map Reproduction.- Hours

The theory and practice of map reproduction processes, with emphasis on the care and operation of regimental equipment. Instruction consists of plate graining, hand and machine; autographic transfer process; wet plate photography; photographic transfer process; direct transfer process; retransferring; preparation and use of chemicals; corrections and additions to plate; practical operation of regimental equipment, litho power press and litho hand press; the care and use of duplicator, mimeograph and similar machines. 746

2. Photography.- 166

Such theoretical and practical military photography as is essential for a practical regimental photographer. Instruction consists of dry plate photography, theory and practice; the use of company and regimental photographic equipment and supplies; interior, exterior, flashlight and action photography; developing, printing, enlarging, reducing and copying negatives; preparation of lantern slides; making an aerial mosaic by cutting film and the printing of aerial photographs to emphasize topographical features; blue and brown printing; use of and care of blue printing and drying machines.

Total hours 912

C. Operators Course.-

1. Automotive.- Hours

The operation and care of regimental motor equipment together with the use of air compressors and air tools. The following subjects are covered: the gasoline motor, its maintenance and operation; the truck chassis and auxiliary parts of the truck; the maintenance and operation of the five and ten ton tractors; the operation and care of the outboard motor; the concrete mixer; hoisting engines; truck cranes; boilers; and pile driver. 480

III. Programs: C (Continued)

Hours

2. Electrical.- 288

The theory and practice of direct and alternating currents and machines sufficient for the proper understanding, and the efficient operation and care of the regimental electrical equipment. The following subjects are covered; Elementary magnetism and electricity; D. C. and A. C. circuits; D. C. machines and their characteristics; D. C. instruments; tests and efficiencies; the storage battery, its care and operation.

3. Water Supply.- 144

The elementary theory of hydraulics, hydrology and pumping machinery sufficient for the proper care and operation of the mobile water purification unit. The following subjects are covered; Sources of water; run-off; discharge; the operation and care of hand and power pumps; water points; purification; Army requirements and equipment; the construction, care and operation of the mobile water purification unit; instruction with the water supply equipment of the combat engineer regiment.

Total hours 912