

MICHIGAN
STATE HIGHWAY DEPARTMENT
G. Donald Kennedy
State Highway Commissioner

SELECTED BIBLIOGRAPHY
ON
AIRPORT CONSTRUCTION FOR NATIONAL DEFENSE

By
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INTRODUCTION

This bibliography has been prepared at the request of the sub-committee on flight strips under the direction of the Highway Engineering Committee.

The purpose of the study was to search available technical literature for references to information concerning the design and construction of flight strips and to compile this information for distribution to those members of the department responsible for the development of a flight strip program.

Soon after the start of this project, it was realized that published information on the subject of flight strips was very limited. Due to the paucity of data available, the scope of the bibliography was enlarged to include any information on the planning and construction of airports in general. This was not done with any thought of making the bibliography long and impressive, but rather with the realization that many of the principles of airport planning and construction apply equally well to the subject of flight strips.

More than 250 references were found relating to the subject. This total was finally narrowed down to 132 references which were abstracted and a very brief description of the contents were included following each reference.

A large number of sources were used in compiling the bibliography. Some of the more common periodicals and publications are included in a list herewith. The majority of the references are available at the Michigan State College Library and it is believed that the remainder may be found at the University of Michigan Library in Ann Arbor. Although only articles having specific reference to the various sub-titles have been

included in the bibliography, it is recommended that some of the publications dealing entirely with aeronautics, such as, the Civil Aeronautics Journal, and Aero Digest should be scanned for items of general interest.

SUBJECT INDEX

Because of the many minor subdivisions in the field of airport construction which are embraced in the different publications, it has been found desirable to classify the major divisions in order to simplify the use of this bibliography. The capital letters in this list correspond with those following the references in the bibliography.

A. General

Publications, books and reports which deal with the subject of airports in a more or less broad sense, not having specific detailed treatment of the headings listed below. Such topics as the relation, influence and importance of airports to aircraft development, the effect and relation of centers of population and manufacturing, changes in these factors on airports, the treatment of systems of airports in the larger subject of airways and trends in the development of fighting and transportation.

B. Planning and selection of sites

Economic and defense considerations, topographic and soil surveys, location in relation to civilian and war use, consideration of various types of airfields such as airdromes, landing fields and flight strips, future expansion, master plans, standard plans, meteorological data, zoning ordinances, land requirements and acquisition, accessibility to communities and military establishments.

C. Earthwork

The design and movement of earth to produce the relatively flat surfaces required. This includes selection of borrow material on the

airport site and in adjacent areas, methods and equipment for handling, hydraulic land fills, laboratory and field tests, to produce stable foundations of runways and buildings.

D. Drainage

Design and construction of surface and subterranean drainage systems and structures, ground water studies and hydrologic data.

E. Runway surfacing.

The design and construction of runway surfaces, aprons, taxi strips and hangar floors. This includes different types of surfaces such as concrete, asphalt and soil-cement construction, consideration of thickness and cross-section for various types of aircraft and loads, construction equipment and methods.

F. Buildings

Consideration of the design and construction of hangars, service buildings and utilities in relation to the airport layout.

G. Lighting

This includes all boundary lights, runway marking lights, flood lights, lighting of wind direction indicator, beacons, radio beams and other electrical safety devices.

H. Camouflaging

Relation of natural camouflaging to airport location, arrangement of aircraft storage and utilities for maximum protection from air and ground attack, provisions against sabotage, underground structures,

treatment of existing, as well as contemplated construction including such items as dazzle painting, use of plant material, dummy airports and structures, aerial photography to aid in construction and to check the efficiency of camouflage practices.

I. Maintenance

Snow and ice removal and control, repair under enemy action, fire fighting, utilities required for maintenance of aircraft and supply of fuel.

FINDING INDEX

The numbers listed below correspond to those preceding the references in the bibliography.

A General	B Planning & Selec- tion of Site	C Earth- work	D Drain- age	E Runway Surfac- ing	F Build- ings	G Light- ing	H Camou- flaging	I Mainten- ance
3	4	1	1	1	7	12	40	5
9	6	26	7	7	8	22	61	24
10	7	45	26	11	49	27	86	29
17	8	48	28	12	62	59	111	30
18	13	49	44	15	75	62	117	32
23	16	62	45	19	81	110		51
36	20	69	48	26	99	116		57
37	23	81	49	31	101			82
38	25	86	55	42	113			93
39	26	88	62	45	119			95
41	41	103	65	48	120			108
47	43	104	69	49				113
58	45	110	81	50				114
63	48	112	86	52				130
68	49	131	98	55				
72	52		100	56				
76	60		103	62				
83	61		107	64				
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	132							

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1. AARON, H., and KELLEY, J.A., JR., "Stabilization of Gravel Runways on Washington National Airport; Bituminous Concrete Surface on Stabilized Gravel Foundation", Ill. Diags Plan, Public Roads October 1941. 22:167-82, 191-2. C-D-E

Description of construction operations including hydraulic land fill, selection of proper material for runway bases and elimination of silt and muck, manipulation of fill material, soil borings and control tests. Specifications of materials for asphaltic concrete surfaces.

2. AERO DIGEST, "Automobile Terminals at Airports; Subterranean Shelters", Il. Diags., 38:74, 77+, June 1941. (P. Archibald)
3. AERO DIGEST, "Dual Role of the Airport", 39:97-8+, August, 1941 A
J.W. Wood.

Discusses the need for building airports suitable for both army and civilian use, and the economics of runway location in the airport.

4. AERO DIGEST, "Master Plan for Airport Development Plans", 39:60-1, August 1941. B

Before any actual construction or purchase of land a complete master plan to take care of any reasonable future demands should be drawn up and then development to follow in orderly steps. Plan for complete airport included.

5. AERO DIGEST, "Snow Removal by Modern Simplified Methods", Il., 35:36-8, October, 1939. I

Snow control by both removal and compaction. Points out that ordinary city snow removal equipment may fail to do a satisfactory job at times. A system of drag followed by 3 rollers, each 10 feet long and 42 inches in diameter used. Compaction is first accomplished on runways 150 feet, then on landing strips 500 feet, and finally over the entire field.

6. AERO DIGEST, "C.C.A. Recommendations on National Program for Airports" B 34:50, April, 1939.

Specific recommendations on the financing, by Federal Aid, of airports, landing areas and navigation facilities.

7. AERO DIGEST, "New Base for U.S. Army at Bolling Field", Il., 31:42+, December, 1937. B-D-E-F
- Selection of new site, grading land reclamation bituminous surfaces, drainage, concrete aprons and hangar floors. Buildings and facilities for army personnel constructed.
8. AERO DIGEST, "Grand Central Air Terminal, Glendale, California", 31:48-9+, August, 1937. B-F
- This article covers a diversified airport set-up and management, and shows how many different phases of flying can be put on a paying basis if properly planned in the construction of the airport facilities.
9. AERO DIGEST, "Large Scale Improvement Program Modernizes Strategic Airports", Il., 39:88+, September, 1941. A
10. AIR COMMERCE BULLETIN, "Report on Nation-Wide Airport Survey Sent to Congress", 10:260-1, April, 1939. A
- A discussion of the airport needs of the country as a whole, both in new airports and the modernizing of existing ones.
11. ALDOUS, W.M., "Getting Satisfactory Results From Airport Paving", Il., Canadian Engineering, R & B, 79:20-1, December, 1941. E
12. AMERICAN CITY, "Reflector Strips for Airport Runways", 55:123, July, 1940. E-G
13. AMERICAN CITY, "Airport Location and City Planning", 51:17, October, 1936. B
- Stresses the importance of relation between airport and city planning to provide for future expansion. Cites case of Chicago airport.
14. AMERICAN CITY, "Airport for Small City; Great Falls, Mont.", Il., 55:71, June, 1940.

- 15. AMERICAN CITY, "Cotton Fabric Reinforcement of Bituminous Airport Runway", 51:11, March 1936. E

Experimental section of runway at Newark Airport.

- 16. AMERICAN CITY, "Airport Development Planned in Massachusetts", Diags., 52:47-8, February, 1937. B

Makes a distinction between "landing strip" and "flight strip". The latter is along highway, not less than 200 x 800 feet, should be from 15 to 50 miles apart. Points to use of flight strips for transfer of mail from air to road.

- 17. AMERICAN MUNICIPAL ASSOCIATION, "Municipalities and Airport Zoning", 15 page pamphlet, 50 cents, A. Fuller Company, 1313 E. 60th St., Chicago, Illinois, 1941. A

- 18. AMERICAN MUNICIPAL ASSOCIATION, "Airports", 26 page pamphlet, 50 cents, 850 58th St., Chicago, Illinois, 1937. A

A brief outline of the municipal, state and federal problems arising from air traffic.

- 19. ANDERSON, A.A., "Concrete for Airport Runways, Aprons, Taxi Strips and Pavements", Il., Aero Digest, 31:24-6, October, 1937. E

General discussion on the desirability and adaptability of concrete for runway paving. The author points out that many of the considerations and methods used in highway paving apply to airports.

- 20. ANDREWS, A., "Design for the Airport of Tomorrow", Diag. Plans, Aero Digest, 39:92, 94, August, 1941. B

Advocates the use of dual runways and gives a detailed plan for the layout of a large airport.

- 21. ARNOLD, R.R., (see 40).

- 22. AVIATION, "Lighting at the Washington National Airport", 41:142. G

Flood lights at ends of runway, traffic lights, lighting plan.

23. AVIATION, "Detroit Gets New Airport", 40:52, May, 1941. A-B
The story of how the Detroit airport committee overcame all obstacles in getting a much needed new field.
24. AVIATION, "Rolling It Down", 37:22-3, January, 1938, I
Il. Diag.
How Minneapolis handles the snow problem on its municipal airport.
25. BABCOCK, H.H., "Building an Adequate Airport With Limited Funds; Rapid City, South Dakota, With Cost Data", Il., B
Public Works, 70:12-13, September, 1939.
26. BAKER, G.F., "Dayton Improves its Municipal Airport", Il. B-C-D-E
Plan, Aero Digest, 29:28-9, December, 1936.
Describes a modernizing project giving data on concrete pavement placed per day with costs, data on the main features of concrete slabs and the layout of the entire airport. Thickened edge and other highway features and equipment used.
27. BARTOW, J.B., "Controlled Lighting for Landing for Zero-Zero Conditions", Il., Aero Digest, 29:25-7, October, 1936. G
Discussion of theory of light penetration in poor visibility and methods of lighting to aid in landing under conditions of poor visibility.
28. BERRY, J., "Airport Drainage and Subdrainage", Il. Plan, D
Public Works, 72:21-2, March, 1941.
Consideration of arrangement of soil and subsoil strata, soil water both capillary and free, rainfall, temperature and provision for removal of both surface and subsurface water.
29. BISHOP, M.G., "Be Prepared! Equipment and Personnel Training for Airport Emergencies", Il., Aviation, 36:16-17, April, 1936. I
Fire trucks, hand extinguishers, push cart equipment and general fire protection set-up.

30. BOUCHARD, D.D., "Snow Removal on Airport's Winter Problem", I
Il., American City, 56:40-1, February, 1941.
31. CAMPEN, W.H., "Omaha Airport Runways", Roads and Streets, E
82:62+, May, 1940
- A detailed technical paper on the stabilization of base courses and wearing surfaces. Numerous tables on the gradations, soil test constants and soil characteristics. Field and laboratory tests of bearing capacity of stabilized soils to check certain design formulas by actual field performance.
32. CANADIAN ENGINEER, R & B, "Snow Handling Methods on Canadian I
Airports", Il., 78:30-2, October, 1940.
33. CANADIAN ENGINEER, "Construction of Toronto's Two Airports",
75:11-12, August 9, 1938.
34. CANADIAN ENGINEER, R & B, "Airports for Peace or War",
S.S. Hanks, Il., 78:18-19+, February, 1940.
35. CANADIAN ENGINEER, "Newfoundland Airport", Il. Plan., 76:6-8,
March 7, 1939.
36. CIVIL AERONAUTICS JOURNAL, "Airport Projects Divided into A
Three Categories", 2:30, January 15, 1941.
37. CIVIL AERONAUTICS JOURNAL, "Sites Listed for Survey Under A
1942 Appropriation for Airport Construction", 2:141-2, 150,
June 15, 1941.
38. CIVIL AERONAUTICS JOURNAL, "W.P.A. Report to Nation Lists A
Extension of Airports and Airways", 1:160, April 15, 1940.
39. CIVIL AERONAUTICS JOURNAL, "First Phase of Airport Plan Com- A
pleted; \$80,000,000 Asked", 1:452+, October 15, 1940.

40. CLARK, WALTER, and ARNOLD, R.R., "Concealment From the Enemy", H
Military Engineer, 33:361, September, 1941.
- Shows importance of aerial photography in planning camouflage. Photographs with all types of filters and films available to the enemy to check the reduction of visibility obtained.
41. CLAY, LUCIUS D., "The Defense Airport Program of the Civil Aeronautics Administration", Military Engineer, 33:417-20, A-B
October, 1941.
- A general discussion of the urgent need for a large number of military airports, as well as civilian fields. Takes up expansion program, selection of sites.
42. CONCRETE, "Soil-Cement Runway Found Economical for Army Air- E
base", Il., 48:3-4, November, 1940.
- Paving of a 150 foot by 2460 foot runway by the standard soil-cement construction procedure at a cost of 54.5 cents per square yard.
43. CONOLLY, D.H., "Airport Location Problems", Civil Aeronautics B
Journal, 2:108, May 1, 1941.
- Discusses the importance of location in relation to future expansion. Cites the Detroit Airport as an outstanding case of a location which proved insufficient.
44. COTTON, H.E., "Methods of Subgrade Drainage", Diags., Roads D
and Streets, 80:63, May, 1937.
- A general article on drainage with a section devoted to airport surface drainage, with tables of soil particle sizes and ground water flow.
45. CRUM, R.W., "Highway Practices as Applied to Airports", Il.,
Canadian Engineer, R & B, 79:21-2, 94+, February, 1941.
46. DIX, T.W., and REED, G.A., "Development of an Inter-City Air- B-C-D-E
port; Barre-Montpelier Airport, Vermont", Il., Aero Digest,
30-36, June, 1937.
- Description of a joint airport project using a bituminous macadam surface for both runways and hangar floors.

47. DUN'S RECORD, "Army Posts and Nearby Trading Centers; Size and Rate of Growth of Training Camps and Flying Fields Map and Tabulation", 49:12-13, March, 1941. A
48. ENGINEERING NEWS, "Basic Requirements for Airport Design", II. Plans., 125:12-16, July 4, 1940. B-D-E-C
- Fundamentals that must be taken into consideration in planning new airports or in modernizing existing ones such as, obstructions around airports, airplane performance, grading materials, drainage, grading and runways, airport surfaces, design load for runways, military operations, buildings. Contains master plan for airport and table of airport design data.
49. ENGINEERING NEWS, "Building Bases for Our Air Forces", II., 125:544-55, October 24, 1940. B-C-D-E-F
- A far flung system of airfields and bases created by both the army and navy. Different types of stations are included from school fields to operating fields. Facilities include runways of ample capacity, large modern hangars, quarters for personnel, repair and supply buildings, fuel storage tanks, magazines and utilities.
50. ENGINEERING NEWS, "Soil-Cement Runway for Army Airbase Placed with Enrichment in Top Inch", II., 126:531-3, April 10, 1941. E
- Ten percent by volume of Portland cement to a 6 inch compacted depth and a one inch enriched surface was used on runway 150 feet by 2400 feet. Heavy duty field cultivators and barrows, rotary tillers, sheepsfoot and tandem rollers of 3, 10 and 15 ton capacity, pressure distributor for spreading water constituted the principal equipment which produced a density of 150 pounds per square inch in a gravelly selected soil.
51. ENGINEERING NEWS, "Roller Used to Pack Snow at Pittsburg Airport", 128:225, February 5, 1942. I
- Description of snow roller made out of wood.
52. ENGINEERING NEWS, "Atlanta Expands its Airport to Meet Army Demands", 128:215, February 5, 1941. B-E
- Brief description of an airport modernizing project using standard soil-cement construction. A more detailed article will appear in a later issue.

53. FISHER, H.L., "Constructing Mobile Municipal Airport", Il., Public Works, 68-56, June, 1937.
54. GENIE VIVIL, "Le Nouvel Aeroport de Francfort-sur-le-Main, dit Aeroport Rhin-Main", Il. Plans., 110:389-93, May 1, 1937.
55. GRAY, B.E., "Asphalt Surfaces for Airports", Il., Aero Digest, 29:30, 32+, October, 1936. D-E

The author sets forth that a well drained airport should be the primary consideration. An impact load of 1.5 times the static load should be used. Since traffic is infrequent on runway surfaces a softer asphalt should be used. Details of construction using various bituminous materials and conditions are discussed.

56. GRAY, B.E., "Trends in the Construction of Asphalt Surfaces for Roads and Airports", Il., Canadian Engineer, R & B, 78:17-18+, November, 1940. E
57. GRIFFIN, C.L., "Airport Fire Fighting", Il., Aviation, 39:42-3+, June, 1940. I

Various types and installations of fire fighting equipment discussed. Best type for airport use, the gas principle system, consists of spreading and rolling down the snow by a system of drags, spike tooth harrow and light roller. No attempt is made to remove the snow from the runway. Plans of equipment.

58. HANKS, S.S., "Aviation Gets Down to Earth; The Growing Need for Public Landing Fields", 121 pages, \$2.00, Aviation Information Service, 80 Boylston St., Boston, 1940. A
59. HARDING, W.T., "Airdrome Lighting", Il. Diag., Electrical Engineering, 60:157-60, April, 1941. G
60. HARTRANFT, J.B., Jr., "Requirements for Airports, Scheduled and Unscheduled", Il., Public Works, 71:11-12, November, 1940. B

Considerations in the selection of site, conditions required

and desirable to be provided by the designer and engineer-- drainage, sanitation, administration and terminal buildings.

61. HERSUM, L.M., "Protective Design for Military Airports; Possibilities in Air-Raid Cover and Concealment", Diags. Plans., Civil Engineering, 10:764-7, Discussion 787, December, 1940. B-H

The author points out the vulnerability of most U.S. airports, from air attack and ground sabotage, and gives a number of plans for subterranean location of hangars, administration and utilities. Includes plans for underground hangars whose roofs serve also as part of the runways and aprons. Cost estimates for complete underground construction given. Many possible means of camouflaging discussed. A very thorough treatment of airport construction with protection as a primary purpose. Criticism in discussion.

62. HICKEY, C., "Snohomish County, Washington, Builds a Modern Airport", Public Works, 71:20-1, November, 1940. B-C-D-E-G-F

Excellent airport planning and construction of runways 800 feet wide and 1 mile to 1.12 miles long. Concrete and bituminous surfaces, lighting and building plan.

63. HINCKLEY, R.H., "What Airports Need Today", Aero Digest, 35:39+, October, 1939. A

Points to the need for a system of airports. A survey by the C.A.A. showed that the adaptation of existing airports is more pressing than the construction of new ones. The need for buildings, lighting and other facilities is pressing.

64. HOUK, H.H., "Remarks Regarding Airports Runway Surfacing", Roads and Streets, 84:62-3, March, 1941. E

General remarks on good practice of airport paving with emphasis on choice of good soil materials.

65. HOUK, H.H., "Airports Runway Surfacing", Roads and Streets, 84:62-3, March, 1941. D-E

General description of Washington National Airport, subgrade and paving considerations, drainage discussion.

66. HOUSEL, W.S., "Important Considerations in Airport Construction", Il., Canadian Engineer, R & B, 78:22-3+, May, 1940.

67. HULSE, F.E., "Airport Development by Progressive Stages", Bibliog. Diag. Plans., Aero Digest, 30:42-44, February, 1937. B

Gives a number of points on the procedure in establishing an airport plan such as: choose a competent airport engineer; good land with maximum of natural drainage; consider "time distance to city"; locate preferably on windward side of city; prepare master plan of ultimate airport; construct in stages as funds permit, but according to a definite plan.

68. JOHNSON, J.M., "Our Vital Airport Problems; How Shall They be Solved?", Air Commerce Bulletin, 9:105-11, November, 1937. A

A general discussion of increasing sizes and weights of airplanes with the consequent problem of providing larger and larger airports.

69. JOHNSON, P., "Grading, Draining and Paving Canadas' Airports", Il., Canadian Engineer, R & B, 78:16+, January, 1940. C-D-E

70. KELLY, E.J., (see 99).

71. KELLY, J.A., Jr., (see 1).

72. KELTON, E.C., "Airport Planning for National Defense", Il., Civil Engineering, 11:720-1, December, 1941. A-C-E

This article discusses the requirements of 4 classes of airports. Such items as location, availability of utilities such as railroad, power, gas, zoning of areas, sewage and drainage are discussed in relation to the military airport construction. Various types of surfaces for runways are considered. The whole problem is approached from the military viewpoint.

73. KENDALL, T.R., "Experimental Seal on Airport Runways", Il., American City, 53:47-8, October, 1938. E

Sand-tar mixed in place, 2 to 3 gallons for 6 inch mix. Use of 150 and 200 penetration asphalt with varying amounts of different sands as blotters. Local fine sand 80% pass. 80 mesh sieve and 2% pass 200. Asphalt requirement in runways differs from highway. Runways get less kneading.

74. KNIGHT, H.L.M., "Maximum Utilization of Two Runways", Diag., Aero Digest, 31:40+, August, 1937. A-B
- Gives detailed method of computing angle at which to set the second runway in a two-runway airport, the first being set parallel to the direction of the prevailing wind.
75. KNIGHT, H.L.M., "Layout of Airport Runways for Future Expansion", Diags. Plan., Aero Digest, 31:32-3, September, 1937. B-F
- Discusses importance of locating airports as close to city as possible and the problem of design of an airport to keep pace with airplane design. The location of buildings in such a way as not to interfere with future development is emphasized.
76. MACATEE, W.R., "Airport Runway Cross-Sections and the Trends in Design", Diags., Roads and Streets, 86:39-43, February, 1939. Excerpts, Public Works, 69:28-9, December, 1938. A-B-E
77. MACATEE, W.R., "Construction of Runways and Other Airport Surfaces", Il. Diags. Plans., Aero Digest, 34:52-5+, April, 1939. E
- Stabilization of soil, both mechanical and structural. Use of various kinds of asphalt for runway surfaces.
78. MANUFACTURING RECORD, "Charlottes' New Airport", Il., 106:43, October, 1937.
79. MARTIN, G.E., "Constructing Runways and Highways from Shifting Sands", Il., Public Works, 71:22-3, December, 1940. E
- Method of constructing a runway surface in fine sand by use of tar mixed in place in depths of 2 to 6 inches, and sealing with a different tar and pea gravel or stone chips.
80. MARTIN, G.E., "Tar Pavements for Airports", Il., Canadian Engineer, 77:4-6, July 25, 1939. E
81. MARTIN, G.E., "Paving Runways at Airport, Savannah, Ga.", Il., Roads and Streets, 79:43-4, October, 1936. C-D-E-F
- Describes the transformation of a rough sod landing field to a satisfactory, well graded and paved airport, with concrete and steel hangars, drainage system.

82. McLEAN, A.D., "Maintaining Snow-Covered Aerodromes", Canadian Engineer, 77:42+, October 17, 1939. I

83. McLEAN, A.D., "Airport Planning and Construction", Il., Canadian Engineer, 76:4-8+, May 9, 1939. A-B

84. MILLER, A.M., "Low Cost Airport Runway; With Cost Data", Il. Diags., Engineering News, 122:31-2, January 5, 1939. B-E

Adapting of runway design to local conditions and materials, unusually low costs. Cost figures.

85. "NEW ENGLAND REGIONAL PLANNING COMMISSIONS, NEW ENGLAND AIRWAYS", Publication No. 50, January, 1937. A-B

A thorough report on airways, designating the routes and facilities most suitable for development, showing the need of improving such routes in order to provide safe and convenient airways for intraregional and inter-regional air travel. Some of the main points treated are climate, topography, distribution of population, influence of manufacturing, background of aviation, airports and landing fields, aeronautical radio and lighting facilities, air marking laws and regulations.

86. NEWTON, C.T., "Construction of Military Air Fields", Civil Engineering, 11:207-11, November, 1941. B-C-D-E-H

Selection of site, grading, drainage and surfacing of the advance emergency landing field is discussed. Organization of a new Engineer unit for this work is given. Camouflaging of this important type of combat landing field is discussed to some extent.

87. PAGON, W.W., "Some Economics of Airports", Bibliog. American Society of Chemical Engineering Proceedings, 67:153-67, February, 1941, Discussion 67:1273-7, September, 1941. A

A discussion of the economic factors relating to growth in size and in density of use of existing ports, particularly of fields used by transport planes. State planning bodies are compiling lists of airports to be built progressively as demand requires and these will be correlated into a nationwide plan.

88. PARK, K.F., "Grading on the Sacramento Air Depot", Il., Public Works, 68:20, October, 1937. C

- 89. PORTLAND CEMENT ASSOCIATION, "Soil Cement Roads", 52-63, 73-75, E

Specifications for soil-cement surfaces, and a discussion of construction of soil-cement wearing surfaces with enriched top.

- 90. PUBLIC ADMINISTRATION SERVICE, "Airport Dilemma; a Review of Local and National Factors in Airport Planning and Financing", 46 page pamphlet, \$1.00, Chicago, 1938. A

- 91. PUBLIC WORKS, "Charleston Modernizes Its' Airport; With Cost Data", Il., 68:30-1, February, 1937.

- 92. PUBLIC WORKS, "Knoxvilles' New Airport", Il., 67:40+, July, 1939.

- 93. PUBLIC WORKS, "Traveling Motorized Outfits Maintain South Carolina's 24 Airports", Il., 70:16, August, 1939. I

- 94. PUBLIC WORKS, "San Francisco Bay Airport; Exposition Island", Il., 68:1, 9-10, August, 1937.

- 95. PUBLIC WORKS, "Airport Snow Removal and Ice Control", 72:36-7, February, 1941. I

Snow and ice control done similar to highway work except that a reversible blade is advocated.

- 96. PUBLIC WORKS, "Stabilization and Local Soil Aggregates for Airports and National Defense Projects", Il., 72:12-13, February, 1941. E

This article deals with stabilization of base courses by means of blending of selected materials and use of calcium chloride.

- 97. PUBLIC WORKS, "Special Runway for World's Largest Plane! R.D. Spencer, 73:19, January, 1942. E

Paving procedure of runway, with pictures of equipment and operations.

- 98. PUBLIC WORKS, "Principles of Design of Airport Drainage", Diags., 72:39-43, April, 1941. D

Surface drainage and removal of surface runoff, with provision for maximum of operation with minimum difficulty and expense and adaptability to future expansion.

99. PUBLIC WORKS, "Water Supply and Sewage Disposal for Airports", F
71:25-6, November, 1940.
- Aids for estimating the amount of water to be provided, including fire protection and peak demands. Capacity and types of sewage treatment plants, and degree of treatment necessary.
100. PUBLIC WORKS, "Airport Drainage and Subdrainage", Diags., D
71:13+, November, 1940.
- This article discusses the requirements, wherein they differ from highway drainage coefficients and depth and spacing of subdrains, are given.
101. QUARTERMASTER CORPS INSTRUCTIONS AND STANDARDS,--for camps, F-D-E
cantonments and air fields; water supply, sewerage and drainage and roadways.
- Information and instructions for constructing quartermasters and engineers in connection with water supply sewerage, drainage and roadways.
102. RETICKER, E., and KELLY, E.J., "Chicago Spreads Her Wings! A
Municipal and Other Airports", Il. Plan., Map, Aviation, 37:20-1+, February, 1938.
- A general article on the problems and development of Chicago's airport system. Financing problems.
103. ROADS AND STREETS, "Airport Uses Highway Design; Alabama C-E-D
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