PB90-112491

Engineering, Design, and Construction for Hurricanes

An Annotated Bibliography

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ENGINEERING, DESIGN AND CONSTRUCTION FOR HURRICANES

AD-A199 954/9/XAB
Coastal Engineering Studies in Support of Virginia Beach, Virginia, Beach Erosion Control and Hurricane Protection Project. Report 2. Seawall Overtopping Evaluation
(Technical rept.)
Lillycrop, W. J. ; Pope, J. ; Abel, C. E.
Coastal Engineering Research Center, Vicksburg, MS.
Corp. Source Codes: 081491000; 037050
Report No.: CERC-TR-88-1-2
Sep 88 65p
Languages: English
Journal Announcement: GRAI8904
See also Report 1, AD-A194 495.
NTIS Prices: PC A04/MF A01
Country of Publication: United States
A study was conducted to determine overtopping rates for a step-faced seawall with curved parapet. The seawall was designed as part of a beach erosion control and hurricane protection project along approximately 6 miles of Virginia Beach, Virginia. Storm damages to the area have included loss of beach, destruction of bulkhead and seawall systems, damage to buildings, and inshore flooding along the commercially developed and urban shoreline. Using the Store Time-History Method developed for this study to calculate overtopping rates from results of physical model tests, results show that the design will reduce overtopping to a suitable level. The seawall design consists of a seawall with crest elevation of +15.7 ft NGVD fronted by a beach with elevation +3.4 ft NGVD which was testing using storm surge hydrographs from an August 1933 hurricane and a March 1962 extratropical storm. (fr)
Descriptors: *Beach erosion; Beaches; Control; Countermeasures; Flooding; Hurricanes; Protection; Inshore areas; Losses; Model tests; Physical properties; Shores; Storms; Surges; Urban areas; Virginia; *Walls; *Ocean waves
Identifiers: Virginia Beach(Virginia); *Seawalls; Overtopping; NTISDODXA
Section Headings: 47B (Ocean Technology and Engineering--Dynamic Oceanography); 55C (Atmospheric Sciences--Meteorological Data Collection, Analysis, and Weather Forecasting)

AD-A189 595/2/XAB
Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Florida). Reef-Building Corals
(Biological rept.)
Porter, J. W.
Georgia Univ., Athens. Dept. of Zoology.
Corp. Source Codes: 010264062; 406148
Sponsor: Fish and Wildlife Service, Washington, DC.; Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
Report No.: FWS-82/11.73; WES/TR/EL-82.4-73
Aug 87 32p
Languages: English
Journal Announcement: GRAI8812
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Species profiles are literature summaries of the taxonomy, morphology, range, life history, and environmental requirements of coastal aquatic species. They are designed to assist in environmental impact assessment. Four species of reef-building corals are considered: elkhorn coral, staghorn coral, common star coral, and large star coral. All four species spawn annually in the fall during hurricane season. Juvenile recruitment is

low in all four species. Rapid growth rates of species in the genus Acropora (10-20 cm/yr) contrast with slower growth rates of species in the genus Montastraea (1.0-2.0 cm/yr), but both species of Montastraea are also important in reef development due to their massive form and great longevity. Shallow-water colonies of Montastraea survive hurricanes; shallow colonies of Acropora do not. Because of their dependence on photosynthesis for all of their carbon acquisition, the Acropora species reviewed here have a more restricted depth distribution (0-30 m) than do the Montastraea species considered (0-70 m).

Descriptors: *Coastal regions; Colonies(Biology); *Coral; Depth; Distribution; Environmental impacts; Environments; Fishes; Florida; High rate; History; Hurricanes; Invertebrates; Life(Biology); Photosynthesis; Profiles; Rates; Reefs; Requirements; Seasons; Shallow water; South(Direction); Taxonomy; Life cycles; Growth(Physiology); Scientific literature; *Marine biology

Identifiers: *Star coral; *Staghorn coral; *Elkhorn coral; *Acropora cervicornis; *Montastraea cavernosa; *Acropora palmata; *Montastraea annularis; NTISDODXA; NTISDODA

Section Headings: 68GE (Environmental Pollution and Control--General); 47D (Ocean Technology and Engineering--Biological Oceanography)

PB88-126214/XAB

Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Florida). Reef-Building Corals

Porter, J. W.

Georgia Univ., Athens. Dept. of Zoology.

Corp. Source Codes: 010264062

Sponsor: National Wetlands Research Center, Slidell, LA.; Army Engineer Waterways Experiment Station, Vicksburg, MS.

Report No.: BIOLOGICAL-82(11.73)

Aug 87 33p

Languages: English

Journal Announcement: GRAI8806

Sponsored by National Wetlands Research Center, Slidell, LA., and Army Engineer Waterways Experiment Station, Vicksburg, MS.

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Species profiles are literature summaries of the taxonomy, morphology, range, life history, and environmental requirements of coastal aquatic species. They are designed to assist in environmental impact assessment. Four species of reef-building corals are considered: elkhorn coral, common star coral, and large star coral. All four species spawn annually in the fall during hurricane season. Juvenile recruitment is low in all four species. Rapid growth rates of species in the genus Acropora (10-20 cm/yr) contrast with slower growth rates of species in the genus Montastraea (1.0-2.0 cm/yr), but both species of Montastraea are also important in reef development due to their massive form and great longevity. Increased water turbidity and sedimentation cause reduced growth rates and partial or whole mortality in all four species.

Descriptors: *Growth; *Coral; *Invertebrates; *Coasts; Reefs; Life cycles ; Temperature; Salinity; Depth; Food habits; Drawings; Environmental impacts; Oxygen; Morphology; Taxonomy; Spatial distribution; Mexico Gulf; Florida

Identifiers: Predation; *Montastarea; *Acropora; NTISDIFWBS; NTISDODA

Section Headings: 47D* (Ocean Technology and Engineering--Biological Oceanography)

PB87-149019/XAB

U.S. National Conference on Wind Engineering Research (4th)

Hartz, B. J.

Texas Tech Univ., Lubbock. Dept. of Civil Engineering.
Corp. Source Codes: 030330022;
Sponsor: Washington Univ., Seattle. Dept. of Civil Engineering.; Wind Engineering Research Council.; National Science Foundation, Washington, DC.
Report No.: TTU-WERC-4A
Jul 81 463p
Languages: English
Journal Announcement: GRAI8711
See also PB87-149001. Preprints of a Conference held at the University of Washington, Seattle, Washington on July 26-29, 1981. Prepared in cooperation with Washington Univ., Seattle. Dept. of Civil Engineering. Sponsored by Wind Engineering Research Council, and National Science Foundation, Washington, DC.
NTIS Prices: PC A20/MF A01
Country of Publication: United States
The papers in the document represent an exchange of information among engineers, architects, scientists, and other professions on various aspects of wind engineering research. Topics covered are as follows: Economic and social impact of wind and wind engineering--Severe storms, design criteria, wind codes and wind damage: Defining the wind environment--boundary layers, atmospheric turbulence, downslope winds and severe storms. Full-scale and modeling results; Wind loading of buildings and structures--Full-scale and model measurements, effects of neighboring structures and obstacles, pressure distributions and correlations; Dynamic response to wind loadings--Tall buildings, bridges, towers, stacks, modeling, testing and full-scale correlations; and Modeling the wind environment and dispersion control of pollutants and urban aerodynamics.
Descriptors: *Wind(Meteorology); *Buildings; Storms; Tornadoes; Hurricanes; Wind load; Turbulence; Boundary layer; Structural analysis; Wind power generation; Air pollution control; Wind tunnels; Aerodynamics; Wind power generation; Wind pressure
Identifiers: *Wind engineering; Wind loads; Atmospheric dispersion; NTISSOLO; NTISNSFG
Section Headings: 89D (Building Industry Technology--Structural analyses); 55B (Atmospheric Sciences--Dynamic Meteorology); 50B (Civil Engineering--Civil Engineering)

PB87-148987/XAB
Proceedings of the U.S. National Conference on Wind Engineering Research (4th) Held at University of Washington, Seattle on July 27-29, 1981
Hartz, B. J.
Texas Tech Univ., Lubbock. Dept. of Civil Engineering.
Corp. Source Codes: 030330022
Sponsor: National Science Foundation, Washington, DC.; Wind Engineering Research Council.; Washington Univ., Seattle.
Report No.: TTU-WERC-4B
Jul 81 373p
Languages: English Document Type: Conference proceeding
Journal Announcement: GRAI8710
See also PB86-130671. Sponsored by National Science Foundation, Washington, DC., Wind Engineering Research Council, and Washington Univ., Seattle.
NTIS Prices: PC A16/MF A01
Country of Publication: United States
Contract No.: NSF-CME80-23977
The papers in the document represent an exchange of information among engineers, architects, scientists, and other professions on various aspects of wind engineering research. Interest in the application of this research results not only from a desire to minimize the adverse effects of the wind, but also from a desire to achieve economy of design by utilization of

knowledge of wind effects and, where possible, to harness the beneficial effects of the wind for energy and the environment.
Descriptors: *Wind pressure; *Structural engineering; *Meetings; Aerodynamics; Building codes; Hurricanes; Tornadoes; Turbulence; Wind tunnels; Design; Air pollution control
Identifiers: NTISSOLO; NTISNSFG
Section Headings: 89D (Building Industry Technology--Structural analyses); 50B (Civil Engineering--Civil Engineering); 55B (Atmospheric Sciences--Dynamic Meteorology)

PB87-144135/XAB
Wind Loads on Structures: Summary Report on a Conference Held at the California Institute of Technology, Pasadena, California, December 18-19, 1970
Roshko, A.
Texas Tech Univ., Lubbock.
Corp. Source Codes: 030330000
Sponsor: National Science Foundation, Washington, DC.
Report No.: TTU-WERC-1
Jul 71 144p
Languages: English Document Type: Conference proceeding
Journal Announcement: GRAI8710
Sponsored by National Science Foundation, Washington, DC.
NTIS Prices: PC A07/MF A01
Country of Publication: United States
Contract No.: NSF-GK-27100
The announced objectives of the Conference were: to identify and acquaint those interested in solving the problems of wind on structures; to learn the nature and scope of work presently underway; to discuss the various aspects of the wind engineering problem such as aerodynamics of bluff bodies, dynamic interaction of wind and structures, laboratory and field experimental work, wind forces and the design of structures, design criteria and codes, tornadoes and hurricanes; to consider the formation of a Universities Council on Wind Problems which could serve to identify the field and to provide continuity; to lay plans for the preparation of a comprehensive report on wind problems and research similar to the National Academy of Engineering Report on Earthquake Engineering Research; and to prepare a summary report of the proceedings and findings of the Conference.
Descriptors: *Wind pressure; *Structural analysis; *Meetings; Tornadoes; Hurricanes; Buildings; Wind tunnels
Identifiers: *Wind loads; NTISSOLO; NTISNSFG
Section Headings: 89D (Building Industry Technology--Structural analyses)

DE86006300/XAB
Extreme Winds and Tornadoes: Design and Evaluation of Buildings and Structures
McDonald, J. R.
Texas Tech Univ., Lubbock. Inst. for Disaster Research.
Corp. Source Codes: 030330029; 9508514
Sponsor: Department of Energy, Washington, DC.
Report No.: UCRL-15747; CONF-8510118-PT.6
1985 141p
Languages: English Document Type: Conference proceeding
Journal Announcement: GRAI8624; NSA1100
DOE's natural phenomena hazards mitigation conference, Las Vegas, NV, USA, 7 Oct 1985.
Portions of this document are illegible in microfiche products.
NTIS Prices: PC A07/MF A01
Country of Publication: United States
Contract No.: W-7405-ENG-48

The general provisions of ANSI A58.1-1982 are explained in detail. As mentioned above, these procedures may be used to determine design wind loads on structures from extreme winds, hurricane and tornado winds. Treatment of atmospheric pressure change loads are discussed, including recommendations for venting a building, if necessary, and the effects of rate of pressure change on HVAC systems. Finally, techniques for evaluating existing facilities are described. (ERA citation 11:041274)

Descriptors: *Buildings; Design; Evaluation; Hurricanes; Mechanical Structures; Tornadoes; Weather; Wind; Wind Loads

Identifiers: ERDA/420200; NTISDE

Section Headings: 13M (Mechanical, Industrial, Civil, and Marine Engineering--Structural Engineering); 4B (Atmospheric Sciences--Meteorology); 89B (Building Industry Technology--Architectural Design and Environmental Engineering); 55GE (Atmospheric Sciences--General)

DE86006162/XAB

Extreme Winds and Tornadoes: An Overview

McDonald, J. R.

Texas Tech Univ., Lubbock. Inst. for Disaster Research.

Corp. Source Codes: 030330029; 9508514

Sponsor: Department of Energy, Washington, DC.

Report No.: UCRL-15745; CONF-8510118-PT.4

1985 82p

Languages: English Document Type: Conference proceeding

Journal Announcement: GRAI8613; NSA1100

DOE's natural phenomena hazards mitigation conference, Las Vegas, NV, USA, 7 Oct 1985.

Portions of this document are illegible in microfiche products.

NTIS Prices: PC A05/MF A01

Country of Publication: United States

Contract No.: W-7405-ENG-48

The objective of this course on extreme winds, hurricanes and tornadoes is to provide an overview of these natural phenomenon from the perspective of design of new buildings and structures or the evaluation of existing ones. Information is directly applicable to design and evaluation processes. The premise is that the facility under consideration, which may consist of various buildings, structures, processing equipment, stacks, ventilation ducts, etc., can be classified into certain categories, depending on the importance of the mission performed in the facility or the hazard that is presented by the particular operation. Having classified the facility into an appropriate category will automatically define certain design goals for the facility. The design goals are then met by selecting a design wind speed that is appropriate for the specified exceedance probability and by following certain specified design procedures. The problem then is to determine appropriate wind loads and other applicable loads, including dead loads, live loads, seismic loads and other loads that may act on the structures. The design process can then proceed in the usual manner. In the case of existing facilities the strengths of the various structural elements, subsystems and systems are evaluated and these strengths are related to wind speeds that would result in failure to meet the design goals. 12 refs. (ERA citation 11:020694)

Descriptors: *Buildings; *Wind; Design; Hazards; Hurricanes; Safety; Tornadoes

Identifiers: ERDA/420600; NTISDE

Section Headings: 4B (Atmospheric Sciences--Meteorology); 13L (Mechanical, Industrial, Civil, and Marine Engineering--Safety Equipment); 55B (Atmospheric Sciences--Dynamic Meteorology); 94H (Industrial and Mechanical Engineering--Industrial Safety Engineering); 89GE (Building Industry Technology--General)

PB85-217909/XAB
Evaluation of Existing and Potential Hurricane Shelters
Spangler, B. D. ; Jones, C. P.
Florida Sea Grant Coll., Gainesville.
Corp. Source Codes: 078600000
Sponsor: National Oceanic and Atmospheric Administration, Rockville, MD. Office of Sea Grant.
Report No.: SGR-68
Nov 84 71p
Languages: English
Journal Announcement: GRAI8520
NTIS Prices: PC A04/MF A01
Country of Publication: United States
Contract No.: NA80AA-D-00038

Population growth in many coastal areas has led to a situation where it is no longer possible to provide sufficient warning time for everyone to evacuate. People must either evacuate before hurricane warnings are issued or risk staying behind and exposing themselves to hurricane forces. Many will take that risk. The methodology presented in the report should be considered as a first step in developing methodologies for assessing the level of protection that buildings may provide under hurricane conditions. It will be refined as structures in other areas are evaluated. Care should be taken in its application. The methodology should be used only by competent professionals (those thoroughly familiar with the design and construction of buildings, storm forces and past storm damages). The report is intended to assist those professionals and not to relieve anyone of professional accountability for the design and evaluation of structures.

Descriptors: *Shelters; *Hurricanes; *Coasts; Storms; Wind velocity; Loads(Forces); Breaking waves; Damage assessment; Buildings; Roofs; Evaluation; Photographs

Identifiers: Debris; Case studies; Sea grant program; NTISCOMNOA

Section Headings: 13M (Mechanical, Industrial, Civil, and Marine Engineering--Structural Engineering); 4B (Atmospheric Sciences--Meteorology); 85D (Transportation--Transportation Safety); 55B (Atmospheric Sciences--Dynamic Meteorology)

PB85-157949/XAB
Improvement of Vernacular Housing in Jamaica to Withstand Hurricanes and Earthquakes
Intertect, Dallas, TX.
Corp. Source Codes: 082425000
Sponsor: Agency for International Development, Washington, DC.
Report No.: AID-PN-AAN-210
Oct 81 101p
Languages: English
Journal Announcement: GRAI8510
NTIS Prices: PC A06/MF A01
Country of Publication: United States

The vulnerability of native Jamaican housing to hurricanes and earthquakes is analyzed in this report and strategies to reduce this vulnerability are presented. After assessing the risks posed by hurricanes and earthquakes to native housing, the history of Jamaican architecture and housing construction is set forth, with special reference to both non-and semi-engineered contemporary housing. Next, 9 different types of native construction using varied materials are analyzed as to their vulnerability. Both rural and urban building practices are examined and key issues related to housing, i.e., financing, land tenure, the extent of housing deterioration and its implications, and lack of a designated agency to maintain/upgrade existing dwellings, are investigated. Intermediate, short-and long-term vulnerability reduction strategies are assessed.

Finally, a comprehensive program to upgrade non-engineered housing is recommended.
Descriptors: *Structural engineering; *Hurricanes; *Earthquakes; *Residential buildings; *Project management; Performance standards; Earthquake resistant structures; Construction materials; Education
Identifiers: *Jamaica; Retrofitting; Earthquake engineering; Developing country application; NTISAIDLAB
Section Headings: 13M (Mechanical, Industrial, Civil, and Marine Engineering--Structural Engineering); 5A (Behavioral and Social Sciences--Administration and Management); 89B (Building Industry Technology--Architectural Design and Environmental Engineering); 70B (Administration and Management--Management Practice)

PB84-221456
Probability-Based Wind Load Description for Cladding and Structural Members Sensitive to Wind Direction Effects: A Survey of Recent Research
(Final rept.)
Simiu, E.
National Bureau of Standards, Washington, DC.
Corp. Source Codes: 004692000
1983 8p
Languages: English Document Type: Conference proceeding; Journal article
Journal Announcement: GRAI8422
Pub. in Proceedings of International Conference on Application Statistics Probability Soil Structural Engineering held at Florence, Italy on June 13-17, 1983, p273-280.
NTIS Prices: Not available NTIS
Country of Publication: United States
A review is presented of procedures for describing wind loads in both well-behaved and hurricane-prone regions. In addition, recent research is described pertaining to the risk-consistent design of wind-sensitive structures with both specified and unknown orientation.
Descriptors: *Meetings; *Buildings; Loads(Forces); Design; Wind(Meteorology); Risk; Aerodynamics; Structural members
Identifiers: Probability; *Wind loads; NTISCOMNBS
Section Headings: 13M (Mechanical, Industrial, Civil, and Marine Engineering--Structural Engineering); 4B (Atmospheric Sciences--Meteorology); 20D (Physics--Fluid Mechanics); 89D (Building Industry Technology--Structural analyses)

PB84-220771
Fastest-Mile Wind Speeds in Hurricane Alicia
(Final rept.)
Marshall, R. D.
National Bureau of Standards (NEL), Washington, DC. Center for Building Technology.
Corp. Source Codes: 080754004
Report No.: NBS/TN-1197
Jun 84 71p
Languages: English
Journal Announcement: GRAI8421
Also available from Supt. of Docs as SN003-003-02592-5.
NTIS Prices: PC A04/MF A01
Country of Publication: United States
Surface wind speeds recorded during the passage of Hurricane Alicia through the Galveston-Houston area on August 18, 1983, are used to estimate the fastest-mile wind speeds at 10 m above ground in open terrain. The paper describes the relationships between wind speeds for various averaging times and the boundary-layer representations used in the transformation to

fastest-mile speeds. These speeds are compared with wind speeds recommended for the design of buildings and other permanent structures. Errors inherent in the original wind speed records and in the transformations are estimated.

Descriptors: *Hurricanes; *Wind velocity; Velocity measurement; Boundary layer; Building codes; Structural engineering; Mexico Gulf; Texas Gulf Coast(United States)

Identifiers: Hurricane Alicia; Galveston(Texas); Houston(Texas); NTISCOMNBS

Section Headings: 4B (Atmospheric Sciences--Meteorology); 55C (Atmospheric Sciences--Meteorological Data Collection, Analysis, and Weather Forecasting)

PB84-177435

Mejoramiento de las Viviendas Rurales en la Republica Dominicana para Resistir los Huracanes y Terremotos (Improvement of Rural Housing in the Dominican Republic to Resist Hurricanes and Earthquakes)

Agency for International Development, Washington, DC.

Corp. Source Codes: 000573000

Report No.: AID-PN-AAK-036

Apr 81 121p

Languages: English

Journal Announcement: GRAI8413

NTIS Prices: PC A06/MF A01

Country of Publication: United States

Devastation wrought by hurricanes and earthquakes causes serious housing shortages and high reconstruction costs in the Dominican Republic (DR). This study offers alternative construction methods and housing design modifications to improve the resistance of the DR's rural housing to natural disasters and to make housing more accessible to the rural poor.

Descriptors: *Housing studies; *Earthquake resistant structures; *Dominican Republic; Developing countries; Rural areas; Hurricanes; Houses; Design; Recommendations

Identifiers: Developing country application; NTISAIDLAB

Section Headings: 5K (Behavioral and Social Sciences--Sociology); 13M (Mechanical, Industrial, Civil, and Marine Engineering--Structural Engineering); 91E (Urban and Regional Technology and Development--Housing); 89GE (Building Industry Technology--General)

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