

## GLOSSARY

### Abbreviations and Acronyms

**AASHTO**—American Association of State Highway and Transportation Officials  
**AC**—Advisory Circular  
**AFI**—Air Force instruction  
**AFPAM**—Air Force pamphlet  
**AFPD**—Air Force policy directive  
**AFR**—Air Force regulation  
**AIMM to SCORE**—Assess, Implement, Manage, and Measure to Achieve Sustained Compliance and Operational Readiness through Environmental Excellence  
**AR**—Army Regulation  
**AREMA**—American Railway Engineering and Maintenance of Way Association  
**ASTM**—American Society for Testing and Materials  
**ATT-Kin**—attenuation-kinematic  
**AT&A**—air traffic and airspace  
**AT&L**—Acquisition, Technology, and Logistics  
**BDF**—basin development factor  
**BMP**—best management practice  
**CANDE-89**—Culvert Analysis and Design software  
**CCR**—Criteria Change Request  
**CERF**—Civil Engineering Research Foundation  
**CERL**—Construction Engineering Research Laboratory  
**CFR**—Code of Federal Regulations  
**CNO/CMC**—Chief of Naval Operations/Command Master Chief  
**CORPS**—Con conversationally-Oriented Real-Time Programming System  
**CZARA**—Coastal Zone Act Reauthorization Amendments  
**Dia.**—diameter  
**DDSOFT**—Drainage Design Software  
**DEH**—Director of Engineering and Housing  
**DL**—dead load  
**DM**—Design Manual  
**DOD**—Department of Defense  
**DOS**—disk operating system  
**DRIP**—Drainage Requirement In Pavements  
**DR3M**—Distributed Routing Rainfall-Runoff Model  
**EGL**—energy grade line  
**EHGL**—equivalent hydraulic grade line  
**EIA**—Environmental Impact Assessment  
**EIS**—Environmental Impact Statement  
**EPA**—Environmental Protection Agency  
**EQI**—Environmental Quality Initiative  
**ETL**—Engineering Technical Letter  
**EvTEC**—Environmental Technology Evaluation Center

**EXTRAN**—Extended Transport Module  
**E&S**—erosion and sedimentation  
**F**—Fahrenheit  
**FAA**—Federal Aviation Administration  
**FONSI**—finding of no significant impact  
**ft**—feet  
**ft/ft**—feet per foot  
**ft/s**—feet per second  
**ft/s<sup>2</sup>**—feet per cubic second  
**ft<sup>2</sup>**—square feet  
**ft<sup>3</sup>/min**—cubic feet per minute  
**ft<sup>3</sup>/s**—cubic feet per second  
**ft<sup>3</sup>/s/mi<sup>2</sup>/in**—cubic feet per second per square miles per in  
**FHWA**—Federal Highway Administration  
**FWPCA**—Federal Water Pollution Control Act  
**gal**—gallons  
**gal/day**—gallons per day  
**GUI**—graphical user interface  
**H**—head  
**HDPE**—high density polyethylene  
**HDS**—Hydraulic Design Series  
**HEC**—Hydrologic Engineering Circular  
**HEC-RAS**—Hydrologic Engineering Center River Analysis System  
**HGL**—hydraulic grade line  
**HMS**—Hydrologic Modeling System  
**HQ AFCESA**—Headquarters Air Force Civil Engineer Support Agency  
**HQ USACE**—Headquarters U.S. Army Corps of Engineers  
**hr**—hour  
**HSPF**—Hydrological Simulation Program – Fortran  
**HW**—headwater  
**HW/D**—headwater depth  
**HYCHL**—flexible and rigid channel lining design and analysis software  
**HYCLV**—culvert design and analysis software  
**HYDRA**—storm drain and sanitary sewer design and analysis software  
**HYDRAIN**—integrated drainage design software  
**HYDRO**—design event versus return period hydrologic analysis software  
**HYEQT**—flow equation program  
**HY-TB**—Hydraulic Toolbox  
**HY8**—FHWA culvert analysis and design software  
**ICAO**—International Civil Aviation Organization  
**IDF**—Intensity Duration Frequency  
**IFR**—instrument flight rules  
**in**—inches  
**in<sup>2</sup>**—square inches  
**in/ft**—inch per foot

**in/hr**—inches per hour  
**IP**—inch-pound  
**lb/ft<sup>2</sup>**—pounds per square foot  
**lb/in<sup>2</sup>**—pounds per square inch  
**LL**—live load  
**LSP**—length of stone protection  
**m**—meter  
**MACOM**—major command (Army)  
**MAJCOM**—major command  
**McTrans**—Center for Microcomputers in Transportation  
**mi<sup>2</sup>**—square miles  
**MIL-STD**—Military Standard  
**min**—minutes  
**mm**—millimeter  
**mm/hr**—millimeters per hour  
**MODBERG**—frost penetration calculation program  
**m<sup>3</sup>/s**—cubic miles per second  
**NATO**—North Atlantic Treaty Organization  
**NAVAID**—navigational aid  
**NAVAIR**—Naval Air Systems Command  
**NAVFAC**—Naval Facilities Engineering Command  
**NAVFACENGCOM**—Naval Facilities Engineering Command  
**NDSOFT**—Normal Depth Software  
**NEPA**—National Environmental Policy Act  
**NFF**—National Flood Frequency  
**NOAA**—National Oceanic and Atmospheric Administration  
**NPDES**—National Pollutant Discharge Elimination System  
**NRCS**—National Resources Conservation Service  
**O.C.**—on center  
**OH**—Organic clays of medium to high plasticity, organic silts  
**OL**—Organic silts and organic silty clays of low plasticity  
**OLS**—optical lighting system  
**OSHA**—Occupational Safety and Health Administration  
**PAPI**—precision approach path indicator  
**PCASE**—Pavement-Transportation Computer Assisted Structural Engineering  
**PIPECAR**—Pipe Culvert Analysis and Reinforcing Design  
**PL**—Public Law  
**PSI**—pounds per square inch  
**PVC**—polyvinyl chloride  
**R**—radius  
**SAF**—Saint Anthony Falls  
**SCS**—Soil Conservation Service  
**SI**—International System of Units  
**sq mi**—square miles  
**STORM**—Storage, Treatment, Overflow Runoff Model

**SWMM**—Storm Water Management Model  
**SYNOP**—Synoptic Rainfall Data Analysis Program  
**TM**—Technical Manual  
**TOC**—top of conduit  
**TR**—Technical Release  
**TS**—Technical Standard  
**TSMCX**—USACE Transportation Systems Center  
**TW**—tailwater  
**UFC**—Unified Facilities Criteria  
**UH**—unit hydrograph  
**U.S.**—United States  
**USAASA**—U.S. Army Aeronautical Services Agency  
**USAAVNC**—U.S. Army Aviation Center  
**USASC**—U.S. Army Safety Center  
**USATCA**—U.S. Army Training Center, Armor  
**USBR**—United States Bureau of Reclamation  
**USC**—United States Code  
**USD**—Under Secretary of Defense  
**USDOT**—United States Department of Transportation  
**USGS**—United States Geological Survey  
**v.**—versus  
**VASI**—visual approach slope indicator  
**VAST**—Virginia Storm Model  
**VFR**—visual flight rules  
**vs.**—versus  
**WQV**—water quality volume  
**WSPRO**—water surface profile (open channel water surface analysis) software  
**yr**—year

## APPENDIX A

### REFERENCES

#### GOVERNMENT PUBLICATIONS:

1. U.S. Department of Agriculture

Natural Resources Conservation  
Service (formerly Soil Conservation  
Service)  
P.O. Box 2890  
Washington, DC 20013  
Internet site: <http://www.nrcs.usda.gov/>

TR-20, Project Formulation Hydrology

TR-55, Urban Hydrology for Small  
Watersheds

2. U.S. Department of Commerce

DOC/NOAA/National Weather Service  
Office of Hydrologic Development,  
Hydrometeorological Design Studies  
Center, W/OHD13  
1325 East-West Highway  
Silver Spring, MD 20910-3283  
Internet site:  
<http://www.nws.noaa.gov/oh/hdsc/>

Technical Paper 40, Rainfall Frequency  
Atlas of the United States for Durations  
from 30 minutes to 24 Hours and Return  
Periods from 1 to 100 Years (1961)

3. U.S. Department of Defense

Department of the Air Force  
Air Force e-Publishing  
Internet site:  
<http://www.e-publishing.af.mil/>

AFI 32-7061, The Environmental Impact  
Analysis Process

AFPAM 91-212, Bird/Wildlife Aircraft Strike  
Hazard (BASH) Management Techniques

AFPD 32-70, Environmental Quality

Department of the Army  
Corps of Engineers (USACE)  
Engineering and Construction Division  
Directorate of Military Programs  
Washington, DC 20314-1000

AR 200-1, Environmental Protection and Enhancement

ETL 1110-3-466, Selection and Design of Oil/Water Separators at Army Facilities

Technical Report E-59, Handbook for Environmental Impact Analysis

Department of the Navy  
Standardization Documents Order Desk  
700 Robbins Avenue, Bldg. 4D  
Philadelphia, PA 19111-5094

NAVFACINST 11010.44E, Shore Facilities Planning Manual

NAVFAC P-272, Definitive Designs for Naval Shore Facilities

Unified Facilities Criteria  
Internet site:  
[http://65.204.17.188/report/doc\\_ufc.html](http://65.204.17.188/report/doc_ufc.html)

UFC 3-220-03FA, Design: Soils and Geology Procedures for Foundation Design of Buildings and Other Structures (Except Hydraulic Structures)

UFC 3-230-16FA, Design: Drainage and Erosion Control Structures for Airfields and Heliports

UFC 3-250-01FA, Design: Pavement Design for Roads, Streets, Walks and Open Storage Areas

UFC 3-260-01, Design: Airfield and Heliport Planning and Design

#### 4. U.S. Department of the Interior

United States Geological Survey  
Publications Warehouse  
Internet site:  
<http://infotrek.er.usgs.gov/pubs/>

Report No. 2207, Flood Characteristics of Urban Watersheds in the United States

Water-Resources Investigations Report 94-4002, Nationwide Summary of U.S. Geological Survey Regional Regression Equations for Estimating Magnitude and Frequency of Floods for Ungaged Sites, 1993

5. U.S. Department of Transportation

Federal Aviation Administration  
800 Independence Avenue, SW  
Washington, DC 20591  
Internet site: <http://www.faa.gov/>

Order 5050.4, Airport Environmental Handbook

Order 5300.1F, Modifications to Agency Airport Design, Construction, and Equipment Standards

AC 150/5200-33, Hazardous Wildlife Attractants on or near Airports

AC 150/5300-13, Airport Design

AC 150/5320-6D, Airport Pavement Design and Evaluation

Federal Highway Administration  
400 Seventh Street, SW  
Washington, DC 20590  
Internet site: <http://www.fhwa.dot.gov/>

FHWA/RD-88-006-9, Pollutant Loadings and Impacts from Highway Stormwater Runoff, Vol. I – Vol. IV

HDS-1, Hydraulics of Bridge Waterways

HDS-3, Design Charts for Open-Channel Flow

HDS-4, Introduction to Highway Hydraulics

HDS-5, Hydraulic Design of Highway Culverts

HEC-14, Hydraulic Design of Energy Dissipators for Culverts and Channels

HEC-15, Design of Roadside Channels with Flexible Linings

HEC-22, Urban Drainage Design Manual

TS-80-218, Underground Disposal of Storm Water Runoff, Design Guidelines Manual

6. Public Laws, United States Code, and Code of Federal Regulations  
U.S. Government Printing Office  
732 N. Capitol Street, NW  
Washington, DC 20401  
Internet site: <http://www.gpoaccess.gov/>

Coastal Zone Act Reauthorization Amendments of 1990, Section 6217g, PL 101-508, 16 USC § 1455b, November 5, 1990

Coastal Zone Management Act of 1972, PL 92-583, amended by PL 94-310, 16 USC § 1451-1464, October 27, 1972

Environmental Impact Analysis Process (EIAP), 32 CFR 989

Federal Water Pollution Control Act (Clean Water Act), 33 USC § 1251-1387, October 18, 1972, as amended

Fish and Wildlife Act of 1956, 16 USC § 742a-742j, August 8, 1956

Fish and Wildlife Coordination Act, 16 USC § 661-666c, January 3, 1995

Migratory Game-Fish Act, 16 USC § 760c-760g, January 19, 2004

National Environmental Policy Act of 1969, (NEPA), Public Law 91-190, 42 USC § 4321-4347, January 1, 1970

Safe Water Drinking Act of 1974, as amended, PL 93-523, 42 USC § 300f-300j-26, December 16, 1974

Section 301 of the Federal Water Pollution Control Act Amendments of 1972, PL 92-500, 33 USC § 1344, October 18, 1972

Section 401 of the Federal Water Pollution Control Act Amendments of 1972, PL 92-500, 33 USC § 1344, October 18, 1972

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Section 404 of the Federal Water Pollution Control Act Amendments of 1972, PL 92-500, 33 USC § 1344, October 18, 1972

Water Quality Act of 1987, PL 100-4, 33 USC § 1251-1387, February 4, 1987

7. U.S. Environmental Protection Agency  
Ariel Rios Building  
1200 Pennsylvania Avenue, N.W.  
Washington, DC 20460  
Internet site: <http://www.epa.gov/>

Federal Guide for Green Construction Specs, draft

#### NON-GOVERNMENT PUBLICATIONS:

1. AASHTO  
444 North Capitol Street N.W.  
Suite 249  
Washington, DC 20001  
Internet site: <http://www.aashto.org/>

Highway Drainage Guidelines, Volume V

Model Drainage Manual, Chapter 2

Policy on Geometric Design of Highways and Streets

T99, Moisture-Density Relations of Soils Using a 2.5 kg (5.5 lb) Rammer and a 305 mm (12 in.) Drop

2. AREMA  
8201 Corporate Drive, Suite 1125  
Landover, MD 20785  
Internet site: <http://www.arema.org/>

Manual for Railway Engineering

3. ASTM International  
100 Barr Harbor Drive  
PO Box C700  
West Conshohocken, PA, 19428-2959  
Internet site: <http://www.astm.org/>

A760/A760M-01a, Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains

A761/A761M-04, Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches

A762/A762M-00, Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains

A849-00, Standard Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe

B745/B745M, Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains

D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

D2321-04e1, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

D2487-00, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)

HB-17, Standard Specifications for Highway Bridges