UNIFORM DRAINAGE POLICIES AND STANDARDS

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FLOODPLAIN REGULATIONS

UNIFORM DRAINAGE POLICIES AND STANDARDS

for

MARICOPA COUNTY, ARIZONA

February 25, 1987

Approved by the Maricopa County Board of Supervisors and
Flood Control District Board of Directors
April 20, 1987
Resolution FCD 87-7

Flood Control District of Maricopa County
3335 W. Durango St.
Phoenix, AZ 85012
602/262-1501

RESOLUTION FCD 87-7

UNIFORM DRAINAGE POLICIES AND STANDARDS FOR
MARICOPA COUNTY

WHEREAS, the incorporated municipalities and Maricopa County now have widely differing requirements for handling of stormwater drainage by developers; and

WHEREAS, many communities, agencies, and organizations recognize the need to apply uniform drainage policies, standards, and procedures throughout incorporated and unincorporated areas of Maricopa County, and a Task Force on Uniform Drainage Standards was formed consisting of the municipalities of Tempe, Phoenix, Wickenburg, Mesa, Glendale, and Scottsdale, the Maricopa Association of Governments, Homebuilders Association of Central Arizona, Salt River Project, Arizona Consulting Engineers Association, and the Flood Control District, with the municipalities of Chandler, Gilbert, Goodyear, Peoria, and Tolleson maintaining regular contact with the Task Force; and

WHEREAS, the municipalities that participated in the Task Force are prepared to adopt these policies and standards as part of their regulatory structures because they recognize that these policies and standards will result in consistency of analysis of drainage requirements, less staff time and cost in annexing County areas, and residents will be afforded equal and common protection from the hazards of stormwater drainage; and

WHEREAS, developers will find it advantageous to have only one set of drainage standards with which they must comply in developing lands within the incorporated or unincorporated areas of Maricopa County; and

WHEREAS, On September 12, 1983, the Board of Supervisors of Maricopa County and the Board of Directors of the Flood Control District entered into an Intergovernmental Agreement whereby the Flood Control District, through its Chief Engineer and General Manager, assumed all drainage administrative and enforcement responsibilities as enumerated by the Subdivision Regulations and Zoning Ordinance for the Unincorporated Area of Maricopa County, and whereby the District was to develop and recommend to the Board for adoption, a comprehensive Drainage Regulation for the Unincorporated Area of Maricopa County; and

WHEREAS, adoption of policies is a necessary step in the development and adoption of a comprehensive Drainage Regulation; and

WHEREAS, the Flood Control Advisory Board, at its February 1987 meeting, recommended adoption by the Board of Supervisors, the Board of Directors, and the communities of Maricopa County; and

OW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of Maricopa County and the Board of Directors of the Flood Control District hereby approve the Uniform Drainage Policies and Standards for Maricopa County, Arizona, as a policy framework for the preparation of a comprehensive Drainage Regulation.

Chairman, Board of Supervisors
Maricopa County

Chairman, Board of Directors
Flood Control District of Maricopa County

ATTEST:

Clerk of the Board

ACKNOWLEDGEMENTS

This document is the culmination of one and a half years of intense interagency cooperation through the Task Force on Uniform Drainage Standards. It constitutes the most complete multijurisdictional recognition to date of the need to uniformize drainage policies, standards, and procedures throughout Maricopa County.

The following individuals represented agencies and other organizations participating actively in this effort:

Kebba Buckley, Flood Control District of Maricopa County

Tom Ankeny, City of Tempe

John Baldwin, City of Phoenix

Lindy Bauer, Maricopa Association of Governments

Dave Bixler, Homebuilders Association of Central Arizona

Skip Blunt, Town of Wickenburg

Joe Kissel, Salt River Project

Collis Lovely, Arizona Consulting Engineers Association

Keith Nath, City of Mesa

Doug Plasencia, Flood Control District of Maricopa County

Ken Reedy, City of Glendale

Dick Schaner, City of Scottsdale

In addition to the regular Task Force members, several communities maintained regular contact with our efforts and contributed data and other assistance. These were Chandler, Gilbert, Goodyear, Peoria, and Tolleson.

Special recognition and thanks go to Ken Lewis of Boyle Engineering Corporation, who authored the first nine drafts of this document under contract to the Flood Control District. Mr. Lewis also played a key role in facilitating the discussions for the Task Force meetings in the first five months of the writing process. After the close of the Boyle Engineering Corporation contract, he still continued as an active and valued member of the Task Force.

Ms. Kebba Buckley, of the Flood Control District of Maricopa County, served as Project Manager for the Boyle Engineering Corporation contract and as overall facilitator for the Task Force and the Phase I process.

Table of Contents

1.0 INTRODUCTION

The governmental agencies of Maricopa County seek to establish a common basis for drainage management in all jurisdictions within Maricopa County. The Flood Control District of Maricopa County, in April 1985, invited all interested entities to a meeting to establish an agreement in principle. At that meeting, a Task Force was formed to guide the effort.

The Task Force determined that the effort should be in three phases:

Phase 1 Research, evaluate, develop and produce uniform policies and standards for drainage of new development within Maricopa County.

Phase 2 Establish a Stormwater Drainage Design Manual for use by all jurisdictional agencies within the County.

Phase 3 Prepare an in-depth evaluation of regional rainfall data and establish precipitation design rainfall guidelines and isohyetal maps for Maricopa County.

The Task Force spent two months writing a scope of work for a consultant to use as a basis for Phase 1, the establishment of a draft uniform policies and standards document. In July, 1985, the Flood Control District, on behalf of the interested agencies, contracted to Boyle Engineering Corporation for this Phase. Boyle interviewed most of the jurisdictions within the County and some in other areas of the country, wrote the first drafts of the Phase 1 document, and collated and integrated commentary from diverse sources for each draft. Boyle, specifically Mr. Ken Lewis, served as facilitator for the Task Force's discussions of the developing document during 1985.

This document is the culmination of the work of the Task Force for Phase 1. The adoption of these Drainage Policies and Standards by all agencies involved in drainage management will result in a common standard of drainage design across the County and will reduce the time and effort by both designers and government review staff for submitted drainage proposals and designs.

2.0 POLICIES

The following policies express the approach to drainage management of the jurisdictional agencies (AGENCIES) in Maricopa County.

1. The AGENCIES, through the Flood Control District of Maricopa County (DISTRICT), shall establish and publish criteria for drainage planning and design. Guidance relative to construction, operation and maintenance of drainage systems shall also be provided. The AGENCIES shall adopt criteria relevant to all public and private drainage interests. Such criteria shall be periodically reviewed and revised in the light of new knowledge, changing circumstances, and adjustments in overall comprehensive goals and objectives. Until the publication of the stormwater drainage design manual (DESIGN MANUAL), Chapter 4 of this document, "Basis of Design", sections 4.0 through 4.5.4, shall be utilized as a basis for design guidance, criteria, and standards.

2. Drainage planning shall involve concerned publics.

3. Master drainage planning for developments shall be carried out in the earliest stages of the planning process. The proposed methods of managing drainage and associated land use shall be reviewed by the AGENCY early in the process.

4. Drainage planning and design shall be based on the principle of not increasing or transferring detrimental drainage effects to other areas.

5. Basinwide master drainage planning by the AGENCIES is necessary, has started and shall be continued. The plans are being prepared on a priority basis and shall be continued subject to need and available financing.

6. Basinwide master drainage plans shall be periodically reviewed and revised in the light of new knowledge, changing circumstances, and adjustments in comprehensive planning goals and objectives. Unless otherwise determined, such reviews shall be at intervals of about 5 years.

7. The cooperation of the AGENCIES and other affected entities, including the land development industry, shall be sought to coordinate individual development and drainage schemes with the basinwide plans. To facilitate the cooperation of the AGENCIES and other affected entities, each agency shall submit to the District one copy of each draft and final drainage report it receives for any development larger than 160 acres. The DISTRICT shall catalogue and file the reports for library use by those with relevant drainage interests.

8. Drainage planning is for the purpose of minimizing inconvenience and reducing flood damage and potential loss of life. The benefits of this planning reduce overall public and private costs, including the long and short

term costs of new housing, while providing a drainage infrastructure that will account for the implementation of long-term development goals.

9. Uniform drainage policies and standards are intended to improve processing of development requests and equitable application of regulations.

10. Development and basinwide master drainage plans shall include a full range of preventive and corrective approaches, including the following:

-- Maintaining the integrity of existing drainage patterns,

-- Establishment of selected major drainage routes by the use of purchase, dedication, development rights, and easements;

-- Storage and attenuation of stormwater runoff; and

-- Construction of drainage works.

The combination of strategies shall balance engineering, economic, environmental, and social factors in relationship to stated comprehensive planning goals and objectives.

11 Multiple use of drainage works is encouraged, provided the use does not adversely impact the functional design of the system.

12. In accordance with priorities and fiscal capabilities, the AGENCIES shall develop and implement corrective drainage plans which shall mitigate existing drainage problems. Such plans shall be coordinated with comprehensive planning goals and objectives, and shall consider a combination of structural and nonstructural measures. The level of protection shall be determined on the basis of economic analyses, availability of funds and physical constraints.

13. Water conservation will be considered as an adjunct to drainage planning where feasible.

3.0 PLANNING

Drainage planning helps to achieve orderly, efficient, pleasant and diverse development of a community or group of communities. Accomplishment of the comprehensive goals and objectives can be assisted by a broad drainage planning process. Such a process should be considered within the context of the total environmental system and should be compatible with comprehensive regional plans.

The design team should think in terms of natural drainage paths and street drainage patterns and should coordinate its efforts with its drainage engineers and the drainage engineers of the AGENCIES. Drainage measures are costly when planning is poor or mediocre, whereas good planning results in lower cost drainage facilities.

It is vitally important that planning precede development for the following reasons: to ensure drainage problems are not transferred from one location to another, multiple use opportunities are not lost, and the cost for overall drainage facilities are kept to a minimum. This is best accomplished with comprehensive master drainage plans.

3.1 MASTER PLANNING

A master drainage plan describes in detail the recommended plan for drainage and the course of action for implementation in terms of priorities. It shows sizes, types and location of drainage facilities on maps in sufficient detail to allow for planning new development.

Each AGENCY in Maricopa County shall be responsible for master planning stormwater drainage facilities in its jurisdiction. Cooperation among governmental units is desirable, including joint efforts between AGENCIES and the DISTRICT. Any master planning effort shall include consultation with those entities potentially affected by such planning.

Detailed master drainage plans for various designated areas within Maricopa County are in process by both the DISTRICT and individual cities and towns. A number of these are cooperative projects of two or more AGENCIES together with the DISTRICT and one or more other sponsors. These plans are primarily focused on areas of rapid development and areas with existing stormwater problems.

3.2 TRANSFER OF ADVERSE IMPACTS

Planning and design of stormwater drainage systems shall include consideration of impacts on upstream and downstream properties and/or existing drainage

systems. Adverse impacts shall be eliminated wherever possible. Any unavoidable adverse impacts shall be mitigated in coordination with affected property owners and/or AGENCIES. Specifically, the diversion of storm runoff from one drainage area to another introduces significant legal and social problems and shall be avoided unless specific reasons justify such a transfer and the affected jurisdictions agree on the transfer.

3.3 IRRIGATION FACILITIES

Irrigation facilities shall not be utilized for conveyance of stormwater drainage without the prior approval of the owner or operator of such facilities. Such approval shall be required whether or not such facilities are currently used to transport water for irrigation purposes. Any approval shall specify the discharge rate permitted, the location of facilities into which the discharge is permitted, and the length of time such a discharge shall be permitted.

3.4 DRAINAGE REPORTS

When a drainage report is required, it must be prepared in accordance with the AGENCY's requirements and sealed by a civil engineer registered as a professional engineer in the State of Arizona. Drainage reports are required for the following reasons: to analyze the effect that a proposed development would have on the runoff in the vicinity of the development; to provide data to insure that the development is protected from flooding; and to provide data supporting the design of facilities to be constructed for the management of runoff.

At this time, the AGENCIES have varying requirements for whether a drainage report is required and at what point in the planning and review process. **This will be covered in the DESIGN MANUAL by a table which will list the AGENCIES and their specific requirements.**

4.0 BASIS OF DESIGN

Until the publication of the DESIGN MANUAL, this chapter, comprised of sections 4.0 through 4.5.4, is to be utilized as a basis for design guidance and criteria.

4.1 DRAIN CLASSIFICATION

The following classification of drains into minor, major and regional drains is presented as an aid for system analysis:

Minor drains serve watershed areas up to 160 acres and are normally the drains associated with subdivision development.

Major drains include natural and man-made channels, conduits and washes, and serve watershed areas from 160 acres to about 10 square miles.

Regional drains are the main outfalls for drainage. They serve watershed areas generally greater than 10 square miles, and include rivers and washes.

4.2 HYDROLOGIC ANALYSIS

Hydrologic procedures for general application in Maricopa County shall:

-- Provide reliable and consistent results;

-- Be capable of estimating peak discharges for various return periods and degrees of urban development;

-- Produce a hydrograph corresponding to the peak discharge;

-- Utilize input data which is readily available;

-- Be workable for main frame, microcomputer and hand calculations.

For Maricopa County two procedures shall be developed: one for areas less than 160 acres and one for areas greater than 160 acres. The primary differences between the two are ease of use and range of applicability. The specific input parameters required for each procedure shall be established and published in the Design Criteria Manual and shall be periodically updated as required.

For drainage areas less than 160 acres the Rational Method shall be used. This method is the simplest and most widely used procedure for small urban basins.

For drainage areas greater than 160 acres, the SCS dimensionless unit hydrograph procedure shall be used at this time. A new procedure, to be called the Maricopa County Urban Hydrograph Procedure (MCUHP), shall be developed for this area. The procedure shall be described in the DESIGN MANUAL. In the interim, excess rainfall shall be computed using the SCS curve number method; runoff shall be determined by the SCS dimensionless unit hydrograph method, and the resultant hydrographs routed, where necessary, by such methods as those available in SCS TR-20/TR-55 or in HEC-1.

The peak discharges determined by either of the methods are approximations. Emphasis should be placed on the design of practical and hydraulically balanced works based on sound logic and engineering, as well as on dependable hydrology.

4.3 HYDRAULIC ANALYSIS

4.3.1 Storm Sewers

Manning's formula is to be used for calculating the capacity of continous stormwater drains, with appropriate allowances for headloss at inlets, bends, junctions and manholes. Manning's "n" factors and minor energy loss coefficients shall be published in the DESIGN MANUAL. The maximum capacity for circular sections under open channel flow conditions is not to exceed full flow conditions. Uniform flow assumptions may be used in calculating the capacities of minor drains. For major drains, or where a higher degree of accuracy is required, backwater or drawdown curves should be calculated using the Standard Step method. Pressure and momentum theory may be used at bends, junctions, and manholes.

For systems flowing under pressure, the maximum pressure allowed must consider the structural limitations of both the pipe and joint. The hydraulic grade line must be maintained below ground level unless special consideration is taken to prevent water from escaping from sewers or to handle it once it does escape. Whether the system is under pressure or in open channel flow conditions, the hydraulic controls are to be clearly indicated.

4.3.2 OPEN CHANNELS

Open channels have advantages in cost, capacity, multiple use for recreational and aesthetic purposes, and potential for detention storage. However, disadvantages exist in right-of-way needs, maintenance costs and hazards to traffic and pedestrians. Careful planning and design are needed to minimize the disadvantages and to maximize the benefits.

Natural channels have velocities that are usually low, resulting in longer concentration times, increased storage and generally lower downstream peaks. If flows in natural channels are increased, consideration must be given to maintaining their stability. Channels in hillside development areas are to be be retained in their natural state unless otherwise approved by the AGENCY.

If right-of-way is limited, requiring velocities higher than allowable for the existing channel to convey the design discharges, then channel lining is required to prevent scour. The choice of lining is subject to allowable velocities, costs and aesthetics. Man made channel alignments for drains are to coincide with the natural watercourse locations, except as approved by the AGENCY. They are to discharge runoff as nearly as possible in the location and with approximately the same velocities as existed prior to construction. If diversion within a proposed development is required, sufficient work is to be done upstream and/or downstream of the diversion to provide affected properties at least the same level of flood protection as existed prior to the diversion.

Open channels adjacent to public streets are discouraged and require approval from the AGENCY. When it is necessary to locate a channel adjacent to a street, it will be placed a reasonable distance from traffic.

Open channels should maintain subcritical flow conditions wherever possible. Any channel that is not designed for subcritical conditions shall require approval from the AGENCY. Open channels should be designed to allow interception of surface flows. If it is unavoidable to construct the channel without creating a barrier to surface flow, a means of draining must be indicated. In preliminary layouts of the routing of proposed channels, it is desirable to avoid sharp curves. If this is unavoidable, design considerations are to include the reduction of superelevations and the elimination of initial and compounded wave disturbances.

Manning's formula is to be used for uniform flow computations in open channels. Water surface profile calculations are to be calculated using the Standard Step method and confluences and bridge piers are to be analyzed using pressure and momentum theory.

Unlined channels should have side slopes of 3 (horizontal) to 1 (vertical) or flatter. A minimum Manning's "n", applicable for the channel under design, is to be used for checking sections susceptible to scour, and the normal or maximum value used for determining the required cross section. Where the channel roughness changes significantly with depth, a composite Manning's "n" is to be used.

4.4 STREETS

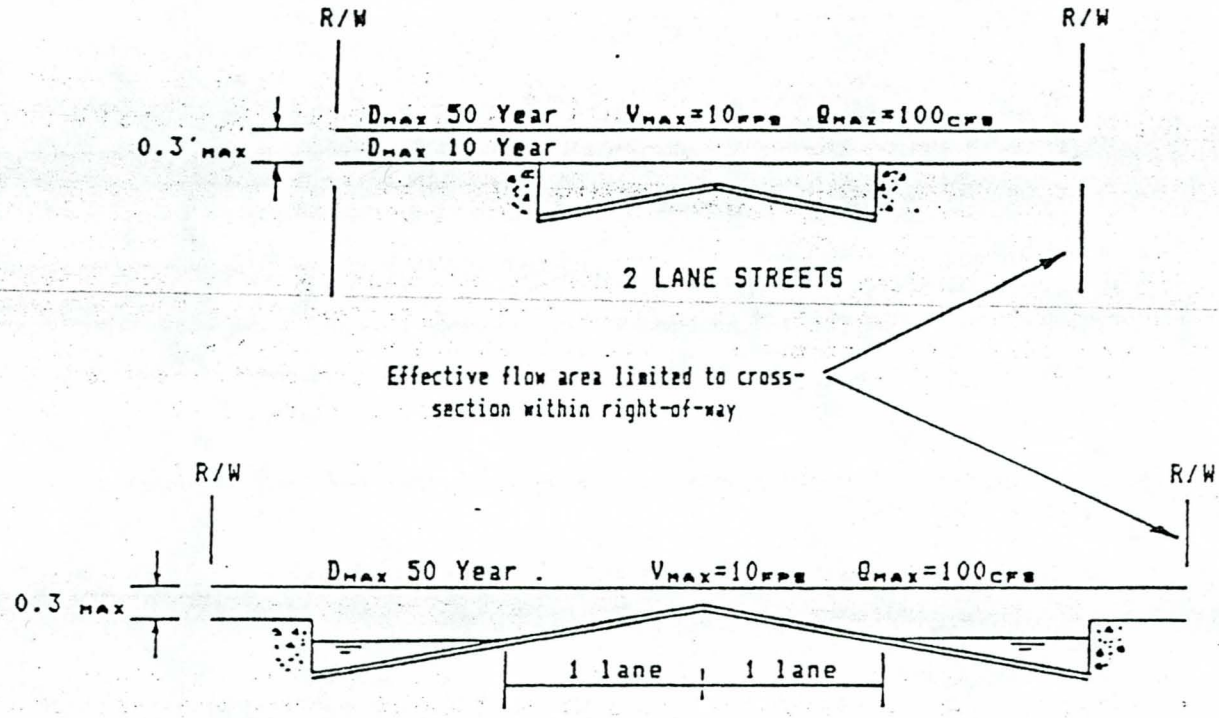
Design standards for the collection and conveying of runoff on public streets is based on an acceptable frequency of traffic interference.

Street drainage shall be governed by Table 1, as illustrated in Figure 1.

Table 1. Design Storm Frequencies for Street Drainage (Years)**

	Frequency
A. LONGITUDINAL STREET FLOW	
No curb overtopping. *	10
Flow to be calculated assuming contained in ROW with: . 0.3 feet maximum depth over curb * . 100 cfs maximum flow . 10 fps maximum velocity	50
B. CROSS STREET FLOW (bridges, culverts, and dip sections)	
No flow across street	50
0.5 feet depth at crown or in valley gutter *	100

* Where no curb exists, maximum depth to be 0.5 feet over crown.
** No new inverted crown streets.



4 LANE AND WIDER STREETS

FIGURE 1A LONGITUDINAL STREET FLOW

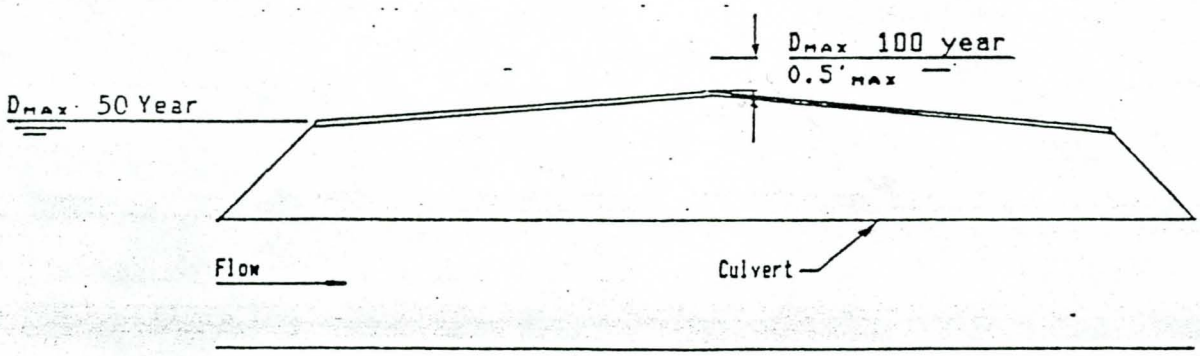


FIGURE 1B CROSS STREET FLOW

LEGEND

D — Depth of Flow (feet)
V — Velocity of Flow (feet per second)
Q — Flowrate (cubic feet per second)

Regardless of the size of the culvert or bridge, street crossings are to be designed to convey the 100-year storm runoff under and/or over the road to an area downstream of the crossing to which the flow would have gone in the absence of the street crossing. In no instance shall flows up to or including 100-year frequencies cause inundation of the lowest finished floors.

For flows crossing broad shallow washes where the construction of a culvert is not practical or desirable, the road should be dipped to allow the entire flow to cross the road. The pavement through the dip section should have a one way slope and curbing and medians must not be raised. For these situations approval shall be obtained from the AGENCY.

4.5 STORAGE FACILITIES

4.5.1 Requirements for Storage

To reduce the significant cost of handling stormwater runoff and to control increased peaks and volumes from development areas, all development shall make provisions to retain the peak flow and volume of runoff from rainfall events up to and including the 100- year 2-hour duration storm falling within the boundaries of the proposed development. The 100-year 2-hour rainfall event shall be established using DISTRICT procedures.

The development shall be considered to extend to the centerline of all existing and/or future streets on the exterior boundaries, and shall include all property within the development. In some areas it may be required to retain runoff generated from adjacent arterial streets. These areas shall be designated by the AGENCY during the preliminary planning stages.

Offsite flows may not be routed through the storage facilities unless approved by the AGENCY.

Storage facilities are to be located so they can intercept the flow from the entire development area. If portions of the area cannot drain to a primary storage facility, then additional facilities are to be added for these areas as approved by the appropriate AGENCY. Wherever possible, the facilities shall be located in parks or other recreational facilities to offset the cost of open space and to encourage improved maintenance.

4.5.2 Conditions When Storage May Be Waived

If the downstream drainage system is adequate for future conditions, storage requirements may be waived by the AGENCY under the following circumstances:

1. The runoff has been included in a storage facility at another location:

2. The runoff can be directly carried to a regional drain:

3. Development of an existing parcel under one-half acre in an area where it can be demonstrated that no significant increase in the potential for flood damage shall be created by the development of that parcel.

If onsite storage is waived, the development may be required to contribute to the cost of drainage works on the basis of runoff contribution.

4.5.3 Method of Storage

Common storage facilities shall be used in preference to individual lot storage wherever possible. Common storage provided for two or more mutually adjoining properties is encouraged, subject to review by the AGENCY(IES). Such arrangements can significantly reduce maintenance costs and increase the potential for multiple uses of the facility.

Residential developments shall have no single lot storage unless approved by the AGENCY, and the design of common facilities shall not assume any individual lot onsite storage, unless approved by the AGENCY. Developments with Homeowners Associations shall locate their facilities in private drainage tracts or public sites dedicated by the developer, in accordance with requirements determined by the AGENCY. The private facilities shall be maintained by the Homeowners Association. Public tracts shall be maintained by the AGENCY. Common storage facilities from single family developments without a Homeowners Association and with public streets shall have maintenance determined by the AGENCY. The number and location of storage facilities within a development is to be approved by the AGENCY. Dedication to the public may require the inclusion of recreational facilities or other features deemed necessary by the AGENCY.

Non-Residential Developments that are not included in a public storage facility, shall provide the required storage on the lot itself without depressing the right-of-way area. Asphalt parking areas, landscape areas and underground tanks may be used for storage purposes.

4.5.4 Drainage of Storage Facilities

Storage facilities are to be drained within a period of 36 hours by either controlled bleed-off, discharge pump, infiltration or dry well.

Controlled bleed-off or pumping is the preferred method and may be required if the AGENCY considers a public nuisance would be created by surface spreading or dry wells. Responsibility for maintenance and operation of the bleed-off and/or pumping system shall be determined by the AGENCY.

Dry wells may be used with the approval of the AGENCY. The maximum disposal rate is not to exceed 0.1 cfs per well unless supported by a detailed certified soils report. Should the soils report indicate a higher rate, a conservative value of 50% of the higher rate (not to exceed 0.5 cfs) shall be used to

compensate for deterioration over time. Dry wells that cease to drain a project area in a 36-hour period shall be replaced by the maintenance authority with new ones, unless an alternate method of drainage becomes available.

APPENDIX A

DEFINITIONS

AGENCY	The governmental authority in whose jurisdiction an aspect of the drainage system is regulated.
Channel	A natural or artificial watercourse with definite bed and banks for conducting flowing water.
Detention System	A system which delays runoff in a controlled manner through the combined use of temporary storage facilities and an open outlet. The duration of downstream runoff is increased and the flow peak immediately downstream is reduced.
DISTRICT	The Flood Control District of Maricopa County.
Drainage Basin	The contributing area to a single point of drainage concentration. Also called catchment area, watershed, or river basin.
Dry Well	A shaft or hole, covered and designed to allow the percolation of drainage water into the ground.
Irrigation Facilities	Channels, pipes, canals, hydraulic structures, and any other facilities through which irrigation water flows.
Outfall	The point, location or structure where drainage discharges from a channel, conduit or drain.
Retention System	A system which retains runoff in a controlled manner through the use of storage facilities. Stored water is either evacuated by percolation or released to the downstream drainage system after the storm event.
Storage Facilities	Reservoir, tank, pipes or other space for either the detention or retention of drainage.

APPENDIX B

REFERENCES

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Floodplain Regulations for Maricopa County

As Adopted August 4, 1986 and Amended September 18, 1989

Published by

Flood Control District of Maricopa County
3335 West Durango Street
Phoenix, Arizona 85009

FLOOD CONTROL DISTRICT
of
MARICOPA COUNTY, ARIZONA

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REVISION LOG

ADOPTED.....AUGUST 4, 1986

[1]Deleted.....3-23-87
[2]Revised.....3-23-87
[3]Added.....3-23-87

[4]Deleted.....4-06-88
[5]Revised.....4-06-88
[6]Added.....4-06-88

[7]Deleted.....9-18-89
[8]Revised.....9-18-89
[9]Added.....9-18-89

TABLE OF CONTENTS

ARTICLE I. AUTHORITY, PURPOSE AND TITLE

Section 101. Statutory Authority.

Sections 48-3603 and 48-3609 of the Arizona Revised Statutes directs each County Flood Control District Board of Directors to adopt and enforce floodplain regulations. Therefore, the Board of Directors of the Flood Control District of Maricopa County, Arizona adopts this Regulation.

Section 102. Statement of Purpose.

It is the purpose of this Regulation to comply with the directive of ARS 48-3603 and to promote and protect the health, peace, safety, comfort, convenience, and general welfare of the citizens within the jurisdictional area of Maricopa County, Arizona and to minimize public losses due to flood conditions in specific areas.

Section 103. Title.

This Regulation may be referred to as the Floodplain Regulation for Maricopa County.

ARTICLE II. RULES, CONSTRUCTION AND INTERPRETATION

Section 201. Rules.

When not inconsistent with the context, words used in the present tense include the future tense, words in the singular number include the plural; words in the plural number include the singular. Words or phrases used in this Regulation shall be interpreted so as to give them the meaning they have in common usage and to give this Regulation its most reasonable application; the word "building" includes the word "structure"; the word "shall" is mandatory and the word "may" is permissive. No provision of this Regulation shall be construed to require written authorization for those exemptions set forth in ARS 48-3613 (B) nor shall the Board of Directors have authority to prohibit said exemptions.

Section 202. Construction and Interpretation.

1. This Regulation shall be liberally construed to effectuate its purposes. The requirements set out herein shall be construed as minimum requirements.

2. Nothing contained in this Regulation shall be construed to limit or repeal any powers granted to the Flood Control District of Maricopa County under state statute. If the provisions of this Regulation conflict with or overlap with other regulations, ordinances and statutes, the regulation, ordinance or statute which imposes the more stringent requirement or restriction shall prevail.

ARTICLE III. DEFINITIONS

Section 301.

In this Regulation unless the context requires otherwise the following words shall be used as defined in this article:

1. Accessory Use: A use which is incidental and subordinate to the principal use of the parcel of land on which it is located.

[9]2. Alluvial Fan: A geomorphologic feature characterized by a cone or fan-shaped deposit of boulders, gravel and fine sediments that have been eroded from mountain slopes, transported by flood flows and then deposited on the valley floors and which is subject to flash flooding, high velocity flows, debris flows, erosion, sediment movement and deposition and channel migration.

[9]3. Apex: The point of highest elevation on an alluvial fan which on undisturbed fans is generally the point where the major stream that formed the fan emerges from the mountain front.

4. Appeal: A request for a review of the Floodplain Administrator's interpretation of any provision of this Regulation, or any determination made under this Regulation.

5. Area of Jurisdiction: The incorporated and unincorporated areas of Maricopa County, including public lands, excluding those incorporated areas of cities or towns which have elected to assume flood plain management powers and duties pursuant to ARS Section 48-3610.

6. Area of Shallow Flooding: An area with flood depths from one to three feet where a clearly defined channel does not exist, the path of flooding is indeterminate and where ponding may be evident.

[9]7. Backfill: The placement of fill material within a specified depression, hole or excavation pit below the surrounding adjacent ground level as a means of improving flood water conveyance or to restore the land to the natural contours existing prior to excavation.

8. Base Flood or One Hundred Year Flood: A flood that has a one percent chance of being equalled or exceeded in a one year period, based on the criteria established by the Director of the State Department of Water Resources.

9. Board: The Board of Directors of the Flood Control District of Maricopa County.

10. Building: A structure affixed to the land having a roof supported by columns or walls built for housing, shelter or enclosure of persons, animals, or property of any kind.

[9]Added 9-18-89

[8]11. Development: Any man-made change to property, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations or storage of equipment or materials.

12. District: The Flood Control District of Maricopa County.

13. Encroachment: The advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or developments into a floodplain which may impede or alter the flow capacity of a floodplain.

14. Exempt Use: Any use of the floodplain specifically exempted from this Regulation by Arizona law or this Regulation.

[9]15. Fill: The placement of fill material at a specified location to bring the ground surface up to a desired elevation.

[9]16. Fill Material: Natural sands, dirt, soil and rock. For the purposes of floodplain management, fill material may include concrete, cement, soil cement, brick or similar material as approved on a case by case basis.

17. Flood or Flood Waters: A temporary rise in water level including ground water or overflow of water onto land not normally covered by water.

18. Flood Insurance Rate Map (FIRM): An official map on which the Federal Insurance Administration has delineated both the special flood hazard areas and the risk premium zones applicable to a community.

[5]19. Flood Insurance Study: The official report provided by the Federal Insurance Administration. The report includes flood profiles and base flood elevations.

20. Floodplain: The areas adjoining the channel of a watercourse including areas where drainage is or may be restricted by man-made structures which have been or may be covered partially or wholly by flood water from the one hundred-year flood.

21. Floodplain Administrator: The individual appointed by the Board to administer and enforce this Regulation.

22. Floodplain Regulations: This Regulation and other codes, ordinances and regulations adopted pursuant to the authority granted in ARS 48-3603 et seq. relating to the use of land and construction within the floodway and floodplain areas.

23. Floodplain Use Permit: A permit which must be obtained from the Floodplain Administrator prior to commencement or continuance of any non-exempt use within a floodplain.

[5]Revised 4-6-88
[8]Revised 9-18-89
[9]Added 9-18-89

24. Flood Proofing: Structural or nonstructural modifications, additions, changes or adjustments to land or structures including utility and sanitary facilities which would preclude flood damage. Structural components shall have the capacity to resist the effects of buoyancy, hydrostatic and hydrodynamic loads.

25. Floodway or Floodway District: The channel of a river or other watercourse and the adjacent land areas necessary in order to discharge the one hundred-year flood without cumulatively increasing the water surface elevation more than one foot.

26. Floodway Fringe District: The areas of a floodplain on either side of the Floodway District where encroachment may be permitted.

[4] DELETED "HABITABLE FLOOR".

[8]27. Interim Delineation: A graphic illustration of an approximate delineation of the floodplain by the Floodplain Administrator made from the most reliable source available where neither a floodplain nor a Floodway District has been determined by detailed methodology.

[9]28. Landfill: A permitted location for the disposal, placement or dumping of garbage, trash, debris, junk or waste material.

[6]29. Lowest Floor: The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable soley for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this Regulation.

[5]30. Mobile/Manufactured Home: A structure transportable in one or more sections, which is built on a permanent foundation when connected to the required utilities. For floodplain management purposes the term "Mobile/Manufactured Home" also includes park trailers, travel trailers and other similar vehicles placed on a site for greater than 180 consecutive days. For insurance purposes the term "Mobile/Manufactured Home" does not include park trailers, travel trailers, and other similar vehicles.

31. Nonconforming Use: The use of any land, building or permanent structure lawfully existing on August 8, 1973, the effective date of Title 45, Chapter 10, Article 4 of the Arizona Revised Statutes. This statute subsequently renumbered as Title 48, Chapter 21, Article 1.

[4]Deleted 4-6-88
[5]Revised 4-6-88
[6]Added 4-6-88
[8]Revised 9-18-89
[9]Added 9-18-89

32. Obstruction: Includes but is not limited to any dam, wall, wharf, embankment, levee, dike, pile, abutment, protection, excavation, channelization, bridge, conduit, culvert, building, wire, fence, rock, gravel, refuse, fill, structure, vegetation or other material in, along, across or projecting into any watercourse which may alter, impede, retard or change the direction and/or velocity of the flow of water, or due to its location, its propensity to snare or collect debris carried by the flow of water or its likelihood of being carried downstream.

33. Person: An individual or his agent, firm, partnership, association, corporation, municipality, or agent of the aforementioned groups, or the State or its agencies or political subdivisions.

34. Principal Structure: A structure used for the principal use of the property as distinguished from an accessory use or structure.

35. Principal Use: The main use of land, building or structure as distinguished from an accessory use.

36. Recreation Vehicle: Any vehicle or portable unit designed for living, sleeping, housekeeping or office purposes which is: a) not more than forty (40) feet in length or eight (8) feet in width; b) transportable on its own chassis; c) maintained in a readily transportable condition at all times. This definition includes motorized and non-motorized vehicles, travel trailers, camping trailers, but does not include mobile/manufactured homes or buildings as defined by this Regulation.

[8]37. Regulatory Flood Elevation: The elevation which is one foot above the base flood elevation for a watercourse. Where a Floodway District has been delineated, the base flood elevation is the higher of either the natural or encroached water surface elevation of the 100-year flow.

[7]32. DELETED "SPECIAL FLOOD HAZARD AREA".

38. Structure: Anything affixed to the ground or attached to something located on the ground, including but not limited to gas or liquid storage tanks, buildings and mobile/manufactured homes as defined by this Regulation.

[7]Deleted 9-18-89
[8]Revised 9-18-89

[8]39. Substantial Improvement: Any repair, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds fifty percent (50%) of the fair market value of the building or structure either: before the improvement or rehabilitation is started or if the building or structure has been damaged by any origin and is being restored, before the damage occurred. In the case of structures which have been damaged, the value of the rehabilitation or restoration must include the fair market cost of all material and labor required to return the structure to its pre-damaged condition, regardless of the actual work performed. "Substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building or structure commences, whether or not that alteration affects the external dimensions of the building or structure. The term does not include any project for improvement of a building or structure which has been identified by the local building official to correct violations of existing State and local health, sanitary or safety code requirements; nor does it include any alteration of a building or structure listed on the National Register of Historic Places or State Inventory of Historical Places.

40. Variance: A grant of relief from the requirements of this Regulation which permits construction or other uses of property in a manner that would otherwise be prohibited or restricted by this Regulation.

41. Watercourse: A lake, river, creek, stream, wash, arroyo, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

[8]Revised 9-18-89

ARTICLE IV. APPLICATION

[8]This Regulation is applicable to all lands located within a designated floodplain which are within the area of jurisdiction of the Flood Control District of Maricopa County.

ARTICLE V. ADMINISTRATION

Section 501. Floodplain Administrator.

[2]1. The Floodplain Administrator as designated by the Board of Directors shall be the Chief Engineer and General Manager of the District who shall administer and enforce this Regulation.

[2]2. Violators of any provision of this Regulation shall be notified by the Floodplain Administrator who shall state the nature of the violation and order corrective action.

[3]3. Failure to comply with ordered corrective action may result in submission of a declaration for denial of flood insurance for otherwise insurable structures to the Administrator of the Federal Insurance Administration pursuant to Section 1316 of the National Flood Insurance Act of 1968 as amended.

[2]4. Failure to appeal the order of the Floodplain Administrator within the time period set forth in Section 602 shall render the order of the Floodplain Administrator final and enforceable as provided in Article XII.

Section 502. Floodplain Use Permit.

[8]1. A Floodplain Use Permit shall be obtained from the Floodplain Administrator prior to commencing any proposed addition, alteration or change of any building, structure, land or other use within the flood plain except as exempted under Section 505 of the Regulation.

[8]2. The Floodplain Administrator may place a time limit and any other conditions or restrictions designed to reduce or eliminate potential hazards to life or property.

[8]3. The applicant may be required to execute deed restrictions running with the land or to post performance bonds, assurances or other security to guarantee the performance of the conditions and restrictions imposed.

[8]4. The applicant shall submit any information to the Floodplain Administrator considered necessary in making determinations required by this Regulation. The applicant may also be required to provide certification that all requirements of the Floodplain Use Permit have been met.

[2]Revised 3-23-87
[3]Added 3-23-87
[8]Revised 9-18-89

Section 503. Elevation/Floodproofing Certification.

[5]An Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer, Architect or Land Surveyor shall be submitted on a form provided by the Floodplain Administrator prior to occupancy or use of any building in the floodplain, except those uses exempted by this Regulation. The Floodplain Administrator shall maintain a record of all Elevation/Floodproofing Certifications.

Section 504. Coordination.

1. The Board and the Floodplain Administrator shall coordinate the provisions of this Regulation with all other interested and affected political subdivisions, Federal and State agencies, as required by ARS 48-3609 and 48-3610.

[3]2. The Floodplain Administrator shall review proposed development to assure that necessary permits required by Section 404 of the Federal Water Pollution Control Act Amendments of 1972 have been obtained for such development prior to issuance of any clearances, permits or variances authorized by state statute or this Regulation.

Section 505. Exemptions.

1. In accordance with ARS 48-3609, nothing in this Regulation shall affect:

[8]a. Existing legal uses of property or the right to continuation of such legal uses. However, if a nonconforming use of land, or a building or structure is discontinued for twelve consecutive months or destroyed to the extent of fifty percent of its value, as determined by a competent appraiser, any further use shall comply with this Regulation.

[8]b. Reasonable repair or alteration of property for the purposes for which the property was legally used on August 8, 1973; except that any alteration, addition, rehabilitation or repair to a building or structure regardless of the cost of the work performed which would result in increasing its flood damage potential by fifty percent or more of the value of the property prior to alteration, addition, rehabilitation or repair shall be either flood proofed or elevated to or above the Regulatory Flood Elevation.

[1]DELETED "STRUCTURES LISTED AS HISTORIC PLACES".

c. Facilities constructed or installed pursuant to a certificate of environmental compatibility issued pursuant to ARS Title 40, Chapter 2, Article 6.2.

[1]Deleted 3-23-87
[3]Added 3-23-87
[5]Revised 4-6-88
[8]Revised 9-18-89

2. In accordance with ARS 48-3613, written authorization shall not be required, nor shall the Board prohibit the following except that before any construction authorized by this subsection may begin, the person shall submit plans for the construction to the Floodplain Administrator for review and comment.

   a. Construction of bridges, culverts, dikes and other structures necessary to the construction of public highways, roads and streets intersecting or crossing a watercourse.

   b. Dams for the conservation of flood waters as permitted by Title 45, Chapter 3 and construction of storage dams for watering livestock or wildlife and structures on the banks of a watercourse to prevent erosion of or damage to adjoining land so long as the structure will not divert, retard or obstruct the natural channel of the watercourse.

   c. Construction of tailing dams and waste disposal areas used in connection with mining and metallurgical operations. This paragraph does not exempt those sand and gravel operations which may divert, retard or obstruct the flow of water in any floodplain from the requirements of this Regulation.

   d. Any political subdivision from exercising powers granted to it under ARS Title 48, Chapter 18, Article 10.

   e. Construction of streams, waterways, lakes and other auxiliary facilities in conjunction with development of public parks and recreation facilities by a public agency or political subdivision.

   f. Construction and erection of poles, towers, foundations, support structures, guy wires, and other facilities related to power transmission as constructed by any utility whether a public service corporation or a political subdivision.

3. In addition to the statutory exemptions, any other use or development within the jurisdiction of this Regulation as may be determined by the Floodplain Administrator to be exempt if the applicant for the exemption satisfies the Floodplain Administrator that such use is not prohibited by any other regulation, code or ordinance, and has a low flood damage potential, will not cause a change in watercourse mechanics including but not limited to obstruction, diversion or other changes detrimental to the natural flow of water and will not cause a hazard to life or property.

4. Before any construction authorized under Section 505 may begin, the person shall submit plans for construction to the Floodplain Administrator for review and comment and to determine whether any of the exemptions set forth in this Section are applicable.

Section 506. Personal Liability.

The exemptions contained in Section 505 do not relieve any person from liability if that person's actions cause flood damage to any other person or property.

ARTICLE VI. FLOODPLAIN REVIEW BOARD, APPEALS AND VARIANCES

Section 601. Floodplain Review Board.

Pursuant to the authority granted in ARS 48-3612, the Board of Directors shall appoint the Flood Control Advisory Board as the Floodplain Review Board to sit in review and make decisions in accordance with ARS 48-3612. The members of the Floodplain Review Board shall serve without compensation except that their reasonable and necessary expenses incurred on board business may be reimbursed.

1. The Floodplain Review Board shall elect a chair and a vice chair from among its own members who shall have power to administer oaths and to take evidence.

2. The Floodplain Review Board shall by resolution fix the time and place of its meetings. The meetings shall be open to the public. Minutes of its proceedings and records of its examinations and other official actions shall be kept and filed in the office of the Flood Control District as a public record.

3. The Board of Directors shall adopt rules of procedure consistent with the provisions of this Regulation for the conduct of Board of Review business including establishment of a fee schedule to cover in part administrative costs incurred in the processing of Appeals, Floodplain Use Permits, Floodplain Variances, plans review and performance bonds.

4. Property shall be posted pursuant to procedures adopted by the Floodplain Board of Review.

5. The Floodplain Review Board may prescribe, in connection with the grant of any variance or appealed use permit, conditions determined necessary to fully carry out the provisions and intent of the Regulation.

6. If the Floodplain Review Board has cause to believe, after approval of a variance, that any stipulations or conditions may have been violated, it may set a hearing for the purpose of determining to revoke the variance for such violation. The Floodplain Review Board may revoke the variance for finding a violation of the stipulations or conditions or it may grant a limited time within which to correct the violation in order to avoid revocation of the variance.

Section 602. Appeals.

1. Appeals of any decision of the Floodplain Administrator to the Floodplain Review Board shall be filed with the Floodplain Administrator within 30 days from the receipt of notice of the decision to be appealed and shall be in writing on a form provided by the Floodplain Administrator. The notice of appeal shall specify the grounds for said appeal.

2. During the pendency of an appeal all existing floodplain delineations shall remain in affect. All other matters regarding the proceeding shall be stayed during its pendency unless the Administrator certifies to the Floodplain Review Board that by reason of facts surrounding the application the stay would, in his opinion, cause imminent peril to life or property. In such cases the other matters shall not be stayed.

3. The Floodplain Review Board shall fix a time for hearing the appeal and give notice to the parties in interest and to the public as set forth herein. The Floodplain Review Board shall hear and decide the appeal within a reasonable time.

4. Any person aggrieved by a decision of the Floodplain Review Board may, within 30 days of such decision, appeal to the Board of Directors by filing a written notice of appeal with the Clerk of the Board on a form provided by the Floodplain Administrator. Said notice shall specify the grounds of appeal. The Board of Directors shall conduct the appeal under such rules of procedure as they shall adopt.

5. Any person aggrieved by a decision of the Board of Directors may file a special action in Superior Court of the State of Arizona to determine if an abuse of discretion by the Board of Directors, the Floodplain Review Board or the Floodplain Administrator may have occurred.

Section 603. Floodplain Variance.

Conditions for the issuance of a variance:

1. The Board of Directors or the Floodplain Review Board as the case may be shall hear and decide requests for variance from the requirements of this Regulation.

[2]2. A variance shall be issued only if the Board of Directors or the Floodplain Review Board finds that all of the following criteria are met:

   a. A determination that no increase in the base flood elevation would result; and

   b. Only if special circumstances, such as size, shape, topography, location or surroundings of the property, would cause the strict application of the Regulation to deprive the property of privileges enjoyed by similar property in the flood plain; and

[2]Revised 3-23-87

c. A variance is subject to conditions to ensure that the variance does not constitute a grant of special privileges inconsistent with the limitations on similar property in the floodplain; and

d. The variance requested is the minimum necessary, considering the flood hazard, to afford relief; and

e. There is a showing of good and sufficient cause; and

f. A determination that failure to grant the variance would result in exceptional hardship to the applicant; and

g. A determination that the granting of the variance will not result in additional threats to public safety, extraordinary public expense, create a nuisance, the victimization of or fraud on the public and that the variance does not conflict with existing local laws or ordinances.

3. In addition to the above requirements the Board of Directors or the Floodplain Review Board may attach such conditions or restrictions to the granting of a variance as it determines necessary to reduce or eliminate potential threats to public safety or to public or private property resulting from the granting of the variance. The applicant among other things may be required to post performance bonds, assurances or other security to guarantee compliance with the conditions and restrictions imposed.

[7]DELETE: PARAGRAPH CONCERNING DEVELOPMENT ON LOTS OF ONE-HALF ACRE.

4. Variances shall not be issued within an area of Interim Delineation with a flow depth of more than two (2) feet if an increase in the flow depth would result.

5. The burden of proof for compliance with the above conditions shall be on the applicant.

Section 604. Publication/Notification of Variance.

Upon the granting of a variance for the construction of a dwelling unit or commercial or industrial structure, where the construction of such unit or structure is otherwise contrary to this Regulation the Board shall notify the applicant in writing that:

1. The issuance of the variance may result in increased premium rates for flood insurance;

2. Construction below the Regulatory Flood Elevation will increase risks to life and property and flooding may occur by channel meander or by a more frequent flood or a larger flood than the 100-year flood event;

3. If the structure is a dwelling unit or business, then the land upon which the structure is located is ineligible for exchange of land pursuant to the flood relocation and land exchange program provided for by ARS Title 26, Chapter 2, Article 2;

[7]Deleted 9-18-89

4. The original of the above written notice shall be recorded with the Maricopa County Recorder in a manner so that it appears in the chain of title of the affected parcel of land. Proof of such recordation shall be maintained on file with the District and be available to any agency requiring any subsequent permits.

5. The Floodplain Administrator shall maintain a record of all variance actions. This record shall be included in the biennial report to the Federal Insurance Administration.

ARTICLE VII. FLOODPLAIN BOUNDARIES

Section 701. Minimum Area for Floodplain Delineation.

[5]All zones designated A, AH, AO, AE or A1 through A99 on the current Flood Insurance Study, the Flood Insurance Rate Maps and Flood Boundary and Floodway Maps for Maricopa County, Arizona shall, when adopted by the Board, constitute the minimum area for management under this Regulation.

Section 702. Other Delineations.

[8]In areas without designated flood hazard zones A, AH, AO, AE or A1 through A99, where development is imminent or ongoing, the District may require developers of land to delineate floodplains to be administered under this Regulation. Such delineations shall be forwarded to the Federal Emergency Management Agency for adoption.

[8]The District may forward to the Federal Emergency Management Agency other delineations obtained from other sources, provided they are determined to be consistent with criteria established by the Director, State Department of Water Resources.

Sources include but are not limited to (1) a developer of floodplain property, (2) a County agency, (3) any agency which must delineate a floodplain as a result of completion of a flood control structure, or (4) the Federal Insurance Administration.

[8]1. Delineations in areas without designated A, AH, AO, AE or A1 through A99 flood hazard zones or changes to existing delineations shall be submitted to the Floodplain Administrator and shall be subject to review for technical adequacy. The Floodplain Administrator shall forward all such delineations to the Arizona Department of Water Resources and to the Federal Emergency Management Agency with his recommendation for approval or denial.

[8]2. All delineations approved by the Federal Emergency Management Agency shall be adopted and included on the Floodplain Management Maps for Maricopa County.

[5]Revised 4-6-88
[8]Revised 9-18-89

Section 703. Publication of Floodplain Boundaries.

[8]All floodplain delineations adopted by the Board of Directors, including all A, AH, AO, AE and A1 through A99 zones on the Flood Insurance Rate Map for Maricopa County, Arizona, shall be shown on official Maricopa County Floodplain Management Maps established by the Floodplain Administrator, which are hereby made a part of this Regulation.

[8]Areas which are under current Flood Insurance Study shall be identified as potential floodplains and shall be designated as preliminary Interim Delineations for floodplain management purposes and shall be designated on these maps as the best technical data available pending final approval of the study by the Federal Emergency Management Agency and the Board.

Section 704. Determination in Case of Dispute.

[8]If the boundary of any floodplain with an Interim Delineation, Floodway District, Floodway Fringe District or Area of Shallow Flooding including Ponding Areas and Alluvial Fans is in dispute the Floodplain Administrator shall determine the boundary using the best technical data available. In all cases, the base flood elevation shall be the determining factor. In cases where a revision of the official floodplain map may be necessary the required public notice and public hearing process shall be followed.

ARTICLE VIII. FLOODWAY DISTRICT

Section 801. Floodplain Use Permit.

[8]The uses within a floodway district (A1-30 and AE Zones) specified in 801.1 through 801.10 below require a Floodplain Use Permit issued by the Floodplain Administrator and are subject to the provisions of Section 802. Issuance of a Floodplain Use Permit does not exempt the holder of the Floodplain Use Permit from any additional requirements necessary to obtain flood insurance.

Uses for which a Floodplain Use Permit may be granted are:

1. Circuses, carnivals and similar transient amusement enterprises.

2. Drive-in theaters, roadside stands, signs and billboards.

3. Operations for extraction of sand, gravel and other materials.

4. Marinas, boat rentals, docks, piers and wharves.

5. Railroads, privately owned and maintained streets, bridges, utility transmission lines and pipelines.

6. Privately owned and maintained dikes and culverts.

7. Storage yards for equipment and machinery.

8 8. Kennels, stockyards, corrals and stables.

Revised 9-18-89

9. Golf courses and parks.

10. Other uses similar in nature to uses described in this section which are consistent with the standards set forth in Section 802.

Section 802. Floodway District Development Standards.

No structure, excavation or fill material (including fill material for roads, dikes, and levees), deposit, obstruction, storage of material or equipment or other uses shall be permitted which alone or in combination with existing or future uses would in the opinion of the Floodplain Administrator cause an increase in the base flood elevations or flood damage potential.

[9]1. Waste disposal systems including landfills, whether public or privately owned, shall not be located wholly or partially within a Floodway District.

[8]2. Any fill material proposed in the Floodway District must be shown by the applicant to have no detrimental effect on the purposes of this Regulation. The amount of fill material shall not be greater than is necessary to achieve the purpose for which it is intended as demonstrated by a plan submitted by the applicant indicating the uses to which the filled land will be put and the final dimensions and the extent of the proposed fill material. Such fill material shall not include junk, trash, tires, garbage, wood or other buoyant materials nor hazardous, toxic or deleterious material and shall be protected against scour and erosion.

[8]3. Structures, not including buildings, within the Floodway District shall have a low flood damage potential, shall be located so as to minimize obstruction to flood flows with any utilities flood proofed, and shall not be designed or utilized for human habitation.

4. The processing or the outside storage of materials and equipment may be permitted if flooding would cause minimal damage to the material or equipment and such material or equipment is either non-buoyant or firmly anchored or located so as to prevent floatation or is maintained in a readily transportable condition so as to be readily removed from the area within the time available after flood warning.

[8]Revised 9-18-89
[9]Added 9-18-89

5. Sand and Gravel Extraction.

a. A Floodplain Use Permit for the extraction of sand and gravel or other materials within the Floodway District shall be granted if the applicant shows that excavations will not be of such depth, width, length, or location as to present a hazard to life or property or to the watercourse in which they are located.

b. Excavations shall not be permitted so close to any floodway crossings, utility structures or facilities as to cause or have the potential to cause an adverse effect on such crossings, utilities or similar facilities.

c. No stockpiling of tailings, overburden or sand and gravel which may obstruct, divert or retard the natural flow of water except as specifically approved by the Floodplain Administrator in a particular Floodplain Use Permit shall be permitted.

d. A plan of development shall be submitted with an application for a Floodplain Use Permit to the Floodplain Administrator. The Floodplain Administrator may require that the plan be sealed by an Arizona Registered Professional Engineer and include a sediment transport analysis.

e. The plan of development shall be required to include a plan of reclamation to leave the land when the approved use is terminated in such a condition as to maintain stability of the floodway by backfilling, contouring, leveling, removal of equipment and materials or other appropriate means.

f. Any substantial change in a previously approved plan of development which may have an adverse effect on stream dynamics or surrounding land uses, life or property shall require an application to amend the approved plan of development.

ARTICLE IX. FLOODWAY FRINGE DISTRICT

Section 901. Floodplain Use Permit.

[8]The uses and structures within a Floodway Fringe District (A1-30 and AE Zones) specified in 901.1 through 901.6 below require a Floodplain Use Permit issued by the Floodplain Administrator subject to the provisions of Section 902. Issuance of a Floodplain Use Permit does not exempt the holder of the Floodplain Use Permit from any additional requirements necessary to obtain flood insurance.

Uses for which a Floodplain Use Permit may be granted are:

1. Any use permitted in Section 801.

2. Structures and dwellings including mobile/manufactured homes, recreational vehicles and other residential uses.

3. New and replacement water supply systems, provided that they are designed to minimize or eliminate infiltration of flood waters into the systems.

4. New and replacement sanitary sewage systems, provided that they are designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters unless otherwise allowed by a permit in conformance with the Federal Water Pollution Control Act.

[8]5. Waste disposal systems including landfills, whether public or privately owned, provided that they are located in such a way as to avoid impairment to them or contamination from them during flooding.

6. Any other uses which will not be subject to substantial flood damage and which will not cause a hazard to life or property or to the public. These may include uses which can be readily removed from floodplain areas during times of flooding.

Section 902. Floodway Fringe District Development Standards.

[8]1. New construction or substantial improvement to any existing structure shall be constructed with methods which minimize flood damage with materials and utilities resistant to flood damage.

[9]2. In A1-30 and AE Zones without a delineated Floodway District, no new construction, substantial improvements, or other development shall be permitted unless it is demonstrated that the cumulative effect when combined with existing and anticipated development shall not increase the encroached water surface elevation beyond the allowable one foot rise.

[8]Revised 9-18-89
[9]Added 9-18-89

[8]3. Dwellings other than mobile/manufactured homes shall have the lowest floor elevated and all utilities flood proofed up to or above the Regulatory Flood Elevation. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer or Land Surveyor that the elevation requirement has been met.

[8]4. Mobile/manufactured homes including permanently placed travel trailers shall be elevated so that the bottom of the structural frame is at or above the Regulatory Flood Elevation and is anchored to prevent floatation, collapse or movement. Methods of anchoring may include, but not be limited to use of over-the-top or frame ties to ground or foundation anchors. Specific requirements shall be as follows:

[5]a. Over-the-top or frame ties shall be provided at each of the four corners of the mobile/manufactured home, with additional ties on each side at intermediate locations and;

b. Mobile/manufactured homes more than 50 feet long require one additional tie per side;

c. All components of the anchoring system be capable of carrying a force of 4,800 pounds;

d. Adequate surface drainage and access for a hauler are provided;

e. In the instance of elevating on piers, setbacks are sufficient to permit steps, pier foundations are placed in stable soil no more than ten feet apart, and reinforcement is provided for piers more than six feet above ground level; and

f. Any additions to the mobile/manufactured home be similarly anchored.

[1]DELETED (Para. 4 concerned with elevation methods other than on fill)

[8]g. Attached appliances and all utilities shall be either elevated or flood proofed up to the Regulatory Flood Elevation.

[9]h. The above requirements do not apply to units in storage and may be waived for units placed for less than 180 consecutive days on a cases by case Floodplain Use Permit basis.

[8]5. An Arizona Registered Professional Engineer shall file with the Floodplain Administrator certification that the elevation requirement has been met and that flood proofing methods including flood proofing of all utilities are adequate to withstand the flood depths, pressures, velocities, impact and uplift forces and other factors associated with the regulatory flood.

[1]Deleted 3-23-87
[5]Revised 4-6-88
[8]Revised 9-18-89
[9]Added 9-18-89

[3]6. For all mobile/manufactured home parks and mobile/manufactured home subdivisions an evacuation plan indicating alternate vehicular access and escape routes shall be filed with the Maricopa County Department of Civil Defense.

[2]7. Fill material, if used to elevate structures, shall meet all of the following standards:

a. The top of such fill material shall be at no point lower than the Regulatory Flood Elevation.

b. Such fill material shall extend at least 25 feet beyond the walls or supporting frame of the structure, or as approved by the Floodplain Administrator.

c. Fill material shall be placed and compacted in accordance with the applicable building code.

d. Fill material shall not interfere with local drainage or tributary flow to the channel of any watercourse.

[8]e. Fill material proposed in excess of the amount and extent required herein shall be shown by the applicant to have no detrimental effect on the purposes of this Regulation and the amount of fill material shall not be greater than is necessary to achieve the purpose for which it is intended as demonstrated by a plan submitted by the applicant indicating the uses to which the filled land will be put and the final dimensions and extent of the proposed fill material.

[8]8. Fill material for purposes other than landfills shall not include junk, trash, tires, garbage, wood or other buoyant materials nor hazardous, toxic or deleterious material and shall be protected as needed against scour and erosion by riprap or other protective measures as approved by the Floodplain Administrator.

[9]9. Landfills shall be protected against scour, erosion and contamination by and contamination of the regulatory flood event.

[8]10. Buildings, except dwellings or any type of residence may be located below the Regulatory Flood Elevation provided that they shall be watertight with walls impermeable to the passage of water and structural components and utilities having the capacity of resisting the effects associated with a base flood. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer that the flood proofing methods used for any nonresidential building meets the purposes and intent of this Regulation.

[2]Revised 3-23-87
[3]Added 3-23-87
[8]Revised 9-18-89
[9]Added 9-18-89

[2]11. Recreational vehicles may be permitted provided that they are maintained in a readily transportable condition at all times and can be readily removed from the area within the time available after flood warning.

[2]12. Sand and Gravel Extraction.

A Floodplain Use Permit for the extraction of sand and gravel or other materials within the floodway fringe district shall be granted if the applicant shows that excavations will not be of such depth, width, length, or location as to present a hazard to life or property or to the floodplain in which they are located subject to the following conditions:

a. Unprotected excavations shall not be permitted so close to any floodplain crossings, utility structures or facilities as to cause or have the potential to cause an adverse effect on such crossings, utilities or similar facilities.

b. No stockpiling of tailings, overburden or sand and gravel which may obstruct, divert or retard the natural flow of tributaries to the main watercourse except as specifically approved by the Floodplain Administrator in a particular Floodplain Use Permit shall be permitted.

c. Dikes or levees are permitted provided it can be shown by the applicant that such dikes or levees would not adversely effect structures, road or utility crossings, other public or private property, will not cause erosion or diversion of flood flows onto property outside the floodplain and will not create a danger to life or property.

d. A plan of development shall be submitted with an application for a Floodplain Use Permit to the Floodplain Administrator. The Floodplain Administrator may require that the plan be sealed by an Arizona Registered Professional Engineer and include a sediment transport analysis.

e. The plan of development shall be required to include a plan of reclamation to leave the land when the approved use is terminated in such a condition as to maintain stability of the floodplain or to an improved condition to enhance higher use of the land.

f. Any substantial change in a previously approved plan of development which may have an adverse effect on stream dynamics or surrounding land uses, life or property shall require an application to amend the approved plan of development.

[2]Revised 3-23-87

ARTICLE X. INTERIM DELINEATIONS

Section 1001. Floodplain Use Permit.

[8]The uses and structures in an Interim Delineation (A Zone) specified in 1001.1 and 1001.3 below require a Floodplain Use Permit issued by the Floodplain Administrator subject to the provisions of Section 1002. Issuance of a Floodplain Use Permit does not exempt the holder of the Floodplain Use Permit from any additional requirements for flood insurance.

Uses for which a Floodplain Use Permit may be granted are:

1. Any use permitted in Section 801 which will not increase the threat of flooding to surrounding property.

2. Any use permitted in Section 901 subject to the provisions of Section 902 which will not increase the threat of flooding to surrounding property.

[8]3. Any other use not specifically named in Sections 801 or 901 provided the applicant submits an analysis of the Interim Floodplain consistent with Article VII. Such delineations shall be subject to review and approval by the Floodplain Administrator prior to issuance of a Floodplain Use Permit and shall be forwarded to the State Department of Water Resources and the Federal Emergency Management Agency in the manner described in Article VII.

Section 1002. Interim Delineation Development Standards.

1. Uses permitted in Section 1001 shall be permitted within the Interim Delineations as set forth above provided that the base flood elevation is not more than two (2) feet above the existing ground elevation either at the site of the proposed use or along a line perpendicular to the direction of flow between such site and the limit of the floodplain.

[8]2. The lowest floor of dwellings other than mobile/manufactured homes shall be elevated up to or above the Regulatory Flood Elevation.

[3]3. Mobile/manufactured homes are permitted subject to the provisions of Section 902.

[3]4. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer or Land Surveyor stating that the elevation and flood proofing requirement has been met.

[3]Added 3-23-87
[8]Revised 9-18-89

[8]5. All nonresidential buildings and substantial improvements thereto shall have the lowest finished floor elevated or the structure shall be flood proofed up to the Regulatory Flood Elevation. Such buildings and substantial improvements thereto shall be watertight with walls impermeable to the passage of water and structural components and utilities having the capacity of resisting the effects associated with a base flood. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer, Architect or Land Surveyor stating that the flood proofing requirement has been met.

[9]6. If fill material is to be used to elevate buildings, such fill material shall meet the requirements of Section 902.7.

[9]7. Fill material for purposes other than landfills shall meet the requirements of Section 902.8.

[6]8. All subdivision proposals and other proposed new developments greater than 50 lots or 5 acres, whichever is the lesser, shall include within such proposals base flood elevation data.

[8]ARTICLE XI. PONDING AREAS, AREAS OF SHALLOW FLOODING AND ALLUVIAL FANS.

Section 1101. Floodplain Use Permit.

[8]Uses, new buildings and substantial improvements thereto which are permitted elsewhere in this Regulation may be permitted in Ponding Areas, Areas of Shallow Flooding and on Alluvial Fans. A Floodplain Use Permit issued by the Floodplain Administrator subject to the provisions of the following appropriate Section shall be required. Issuance of a Floodplain Use Permit does not exempt the holder of the Floodplain Use Permit from any additional requirements for flood insurance.

[9]Section 1102. AO Zone Ponding Area.

[9]1. Any volume displacement shall be equally compensated for from within the same Ponding Area.

[9]2. Residential buildings shall have the lowest floor elevated at least one foot above the average depth of inundation.

[9]3. Nonresidential buildings shall have the lowest floor either elevated or, together with the building contents and utilities, flood proofed at least one foot above the average depth of inundation with watertight walls impermeable to the passage of water and structural components and utilities having the capacity of resisting the effects associated with a Base Flood.

[6]Added 4-6-88
[8]Revised 9-18-89
[9]Added 9-18-89

[9]4. The effective lateral conveyance shall be preserved.

[9]5. If fill material is to be used to elevate buildings, such fill material shall meet the requirements of Section 902.7.

[9]6. Fill material for purposes other than landfills shall meet the requirements of Section 902.8.

[9]7. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer or Land Surveyor on forms provided by the District certifying that the elevation or flood proofing measures are adequate to meet the requirements of this Regulation.

[9]Section 1103. AH Zone Ponding Area.

[9]1. Any volume displacement shall be equally compensated for from within the same Ponding Area.

[9]2. Residential buildings shall have the lowest floor elevated at least one foot above the known water surface elevation.

[9]3. Nonresidential buildings shall have the lowest floor either elevated or, together with the building contents and utilities, shall be flood proofed up to at least one foot above the known water surface elevation with watertight walls impermeable to the passage of water and structural components and utilities having the capacity of resisting the effects associated with a Base Flood.

[9]4. The effective lateral conveyance shall be preserved.

[9]5. If fill material is to be used to elevate buildings, such fill material shall meet the requirements of Section 902.7.

[9]6. Fill material for purposes other than landfills shall meet the requirements of Section 902.8.

[9]7. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer or Land Surveyor on forms provided by the District certifying that the elevation or flood proofing measures are adequate to meet the requirements of this Regulation.

[9]Added 9-18-89

[9]Section 1104. A Zone Ponding Area.

[9]1. Any volume displacement shall be equally compensated for from within the same Ponding Area.

[9]2. In Areas of Shallow Flooding designated as an A Zone, residential buildings shall have the lowest floor elevated at least one foot above the height of the effective outfall or the height of the feature causing the ponding.

[9]3. Nonresidential buildings shall have the lowest floor either elevated or, together with the building contents and utilities, flood proofed up to at least one foot above the height of the effective outfall or the height of the feature causing the ponding with watertight walls impermeable to the passage of water and structural components and utilities having the capacity of resisting the effects associated with a Base Flood.

[9]4. The effective lateral conveyance shall be preserved.

[9]5. If fill material is to be used to elevate buildings, such fill material shall meet the requirements of Section 902.7.

[9]6. Fill material for purposes other than landfills shall meet the requirements of Section 902.8.

[9]7. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer or Land Surveyor on forms provided by the District certifying that the elevation or flood proofing measures are adequate to meet the requirements of this Regulation.

[9]Section 1105. A Zone Area of Shallow Flooding.

[9]1. In Areas of Shallow Flooding other than Ponding Areas, residential buildings shall have the lowest floor elevated at least one foot above the depth of inundation.

[9]2. Nonresidential buildings shall have the lowest floor either elevated or, together with the building contents and utilities, be flood proofed up to at least one foot above the depth of inundation with watertight walls impermeable to the passage of water and structural components and utilities having the capacity of resisting the effects associated with a Base Flood.

[9]3. If fill material is to be used to elevate buildings, such fill material shall meet the requirements of Section 902.7.

[9]4. Fill material for purposes other than landfills shall meet the requirements of Section 902.8.

[9]Added 9-18-89

[9]5. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer or Land Surveyor on forms provided by the District certifying that the elevation or flood proofing measures are adequate to meet the requirements of this Regulation.

[9]Section 1106. Alluvial Fan Development.

[9]1. Development permitted in other sections of this Regulation is permitted in Alluvial Fan Areas with an A Zone designation provided the Base Flood elevation is not more than two (2) feet above existing ground elevation and provided residential buildings shall have the lowest floor is elevated up to or above the Regulatory Flood Elevation.

[9]2. The applicant shall submit a plan of development prepared by an Arizona Registered Professional Engineer, Architect or Land Use Planner.

[9]3. The plan shall include engineering analysis to mitigate all hazards associated with Alluvial Fan flooding including inundation, ground erosion, scour around structures, debris and sediment flow and accumulation in addition to aggradation and degradation of conveyance systems. The plan shall also include building pad and lowest floor elevations.

[9]4. The applicant shall make adequate provisions to maintain all natural and improved drainage or flood conveyance systems.

[9]5. Nonresidential buildings are permitted in Alluvial Fan Areas with an A Zone designation provided the Base Flood elevation is not more than two (2) feet above existing ground elevation and provided the lowest floor is either elevated or, together with the building contents and utilities, be flood proofed up to or above the Regulatory Flood Elevation with watertight walls impermeable to the passage of water and structural components and utilities having the capacity of resisting the effects associated with a Base Flood.

[9]6. In Alluvial Fan Areas with an AO Zone designation, residential buildings shall have the lowest floor elevated at least one foot above the average depth of inundation.

[9]7. Nonresidential buildings in Alluvial Fan Areas with an AO Zone designation, shall have the lowest floor either elevated or, together with the building contents and utilities, flood proofed at least one foot above the average depth of inundation with watertight walls impermeable to the passage of water and structural components and utilities having the capacity of resisting the effects associated with a Base Flood.

[9]8. If fill material is to be used to elevate buildings, such fill material shall meet the requirements of Section 902.7.

[9]Added 9-18-89

[9]9. Fill material for purposes other than landfills shall meet the requirements of Section 902.8.

[9]10. The applicant shall provide an Elevation/Floodproofing Certification by an Arizona Registered Professional Engineer or Land Surveyor on forms provided by the District for each separate building.

ARTICLE XII. VIOLATIONS

[2]Section 1201. Civil Remedies.

As provided for by ARS 48-3613D a person who may be damaged or has been damaged as a result of the unauthorized diversion, retardation or obstruction of a watercourse, or the Flood Control District in the case of any violation of this Regulation, has the right to commence, maintain and prosecute any appropriate action or pursue any remedy to enjoin, abate or otherwise prevent any person from violating or continuing to violate this Regulation. If a person is found by the court to be in violation of this Regulation, the court shall require the violator to either comply with this Regulation, if authorized by the Board, or remove the obstruction and restore the watercourse to its original state. The court may also award such monetary damages as are appropriate to the injured parties resulting from the violation including reasonable costs and attorney fees.

[2]Section 1202. Declaration of Public Nuisance; Abatement.

Every new structure, building, fill, excavation, or development located or maintained in a flood plain since August 8, 1973 in violation of Title 48, Chapter 21, Article 1 of the Arizona Revised Statutes or this Regulation is a public nuisance per se and may be abated, prevented or restrained by action of the State or any of its political subdivisions.

[2]Section 1203. Violation; Classification.

It is unlawful for a person to divert, retard or obstruct the flow of waters in a watercourse if it creates a hazard to life or property without securing written authorization of the Board of Directors, Board of Review or the Floodplain Administrator as required by this Regulation.

A person who violates ARS 48-3615.A is guilty of a CLASS 2 MISDEMEANOR.

[2]Revised 3-23-87
[9]Added 9-18-89

ARTICLE XIII. WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by this Regulation is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Compliance with this Regulation does not insure complete protection from flooding and is not to be construed as a warranty. Larger floods may occur or the flood height may be increased by man-made or natural causes, such as bridge openings restricted by debris, natural erosion, streambed meander or man-made obstructions and diversions. This Regulation is not intended to imply that areas outside the floodplain or land uses permitted within such areas will be free from flooding or flood damaged. This Regulation shall not create liability on the part of the Flood Control District of Maricopa County or any officer or employee thereof for any flood damages that may result from reliance on this Regulation or any administrative decision lawfully made thereunder.

ARTICLE XIV. SEVERABILITY

This Regulation and the various parts thereof are hereby declared to be severable. Should any section of this Regulation be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of this Regulation as a whole, or any portion thereof other than the section so declared to be unconstitutional or invalid.

ARTICLE XV. EFFECTIVE DATE

[9]This Regulation as amended is adopted by the Board of Directors of the Flood Control District of Maricopa County, Arizona, this 25th day of Sept 19 89.

Cherie Pennington
CLERK OF THE BOARD

9/25/89
DATE

*Revised 9-19-89

FEE SCHEDULE

FLOODPLAIN REGULATION
for
MARICOPA COUNTY, ARIZONA

The following administrative fees shall be charged for the processing of Appeals, Floodplain Use Permits, Floodplain Variances, plans review and performance bonds with no provision for refund:

Development Plan Review.....$200+
$20 per acre: Max. $1000

Floodplain Use Permits (Floodplain Administrator)

Single Family Residence.....$25
Commercial/Industrial.....$150
Sand and Gravel Operation.....$200+
$20 per acre: Max. $1000

Appeals/Variances (Floodplain Board of Review)

Residential.....$75
Commercial/Industrial.....$200

Appeals (Flood Control District Board of Directors)

Residential.....$75
Commercial/Industrial.....$200

Floodplain Delineation Review.....$250+
$50 per 1/4 mile

Performance Bond..... 100% cost of required improvement or cost to abate violation, or 50% of value at risk whichever is higher.

Continuance of Hearing (Applicant's Request).....$25

Regulation (Per Copy).....$2

Adopted by the Board of Directors of the Flood Control District of Maricopa County, Arizona, this 25th day of Sept. 19 89.