

ORDINANCES NO. 1670 & 1836

DRAINAGE POLICY



Effective Dates
October 12, 1977
June 20, 1979

CITY OF YUMA
DEPARTMENT OF DEVELOPMENT SERVICES
ENGINEERING DIVISION

ORDINANCES 1670 & 1836*

AN ORDINANCE AS AMENDED OF THE CITY COUNCIL OF THE CITY OF YUMA, ARIZONA ESTABLISHING A POLICY FOR STORAGE AND DISPOSAL OF STORM WATER RUNOFF.

WHEREAS, the development of land results in an increase of impervious watershed area with the attendant result that there is an increase in the volume of storm water runoff; and

WHEREAS, proper measures for handling and disposal of storm water runoff are necessary to the preservation of the public health, safety and welfare; and

NOW, THEREFORE, be it ordained by the City Council of the City of Yuma as follows:

SECTION I. DEFINITIONS

A. "Building Floor Elevation" shall mean the finished floor elevation in feet above mean sea level of the lowest floor of a building. Building floor elevations shall be related to the City of Yuma datum.

B. "Building Pad Elevation" shall mean the elevation in feet above mean sea level of the material on which the floor slab directly rests.

C. "Drainage Plan" shall mean that certain plan on which are shown the location, dimensions and elevations of proposed storm water storage areas.

D. "Ten-Year Storm" shall mean a storm that has a 10% chance of occurring each year in accordance with criteria established by the U.S. National Weather Service, as shown in Exhibit "A" hereby declared to be part of this Ordinance.

E. "Fifty-Year Storm" shall mean a storm that has a 2% chance of occurring each year in accordance with criteria established by the U.S. National Weather Service, as shown in Exhibit "A".

* Ordinance 1836 as approved June 20, 1979, amends Ordinance 1670. Those amendments have been indicated by italic type in this composite document.

F. "Hundred-Year Storm" shall mean a storm that has a 1% chance of occurring each year in accordance with criteria established by the U.S. National Weather Service, as shown in Exhibit "A".

G. "On-Site Retention" shall mean storage on public or private property or any combination thereof, but not on public street or alley right-of-way.

H. "Retention Basin" shall mean a designated area for total storage, without overland relief, of flows generated during a design storm.

I. "Combination Storage" shall mean handling of storm water by utilizing both on-site retention and retention basins.

J. "Freeboard" shall mean the distance between the design high water surface and the top of the wall of a retention basin.

SECTION II. PURPOSE

A. The purpose of this Ordinance is to require the owner/developer of each lot, plot or parcel of land within the City Limits of the City of Yuma to provide storage of sufficient volume to hold the total runoff from the design storm falling on that lot, plot or parcel of land. An exception to this requirement will be granted by the City Engineer only when runoff can be directed into a storm sewer, channel or natural drainageway with sufficient capacity to transport storm water to an approved ultimate disposal site. The owner/developer shall not be required to provide storage for runoff from land other than his own except where it can be proven that flow from adjacent land has historically crossed or inundated the land of the owner/developer.

B. This Ordinance and its revision(s) are intended to be as closely compatible with the long range goals of the Yuma County Flood Control District's future Storm Drainage Master Plan as is possible.

SECTION III. METHODS OF HANDLING STORM WATER

A. Storm water shall be contained within each lot, plot, or parcel of land by any of the following methods:

1. On-Site Retention
2. Retention Basin
3. Combination Storage

SECTION IV. DESIGN STANDARDS FOR HANDLING STORM WATER

A. *When a retention basin is utilized to handle storm water runoff in a residential subdivision, the following design standards shall be applicable.*

1. The minimum storage volume shall be computed by estimating the area under a hydrograph of a 100 year storm of 2 hour duration (1.22 inches per hour) as shown in Exhibit "B" hereby declared to be part of this Ordinance. In addition, the greater of either one foot of freeboard or 25% additional basin capacity shall be provided in the facility.
2. Maximum basin depth shall not exceed 3.5 feet unless otherwise approved by the City Engineer. When additional depth is approved the facility shall be enclosed with a 6' high masonry block fence and 16' wide wood gate with lock.
3. Maximum sides slope shall be 4:1 unless otherwise approved by the City Engineer.
4. An acceptable method of transporting water from the street into the basin shall be provided so as to preserve the integrity of the basin walls and floor.
5. *Daily nuisance water from lawn watering, car washing, etc., shall be intercepted by dry wells prior to reaching the earthen floor of the retention basin and disposed of by utilization of a percolation field.*

6. All residential streets shall be designed to carry the runoff from a 10 year 2 hour storm between the curbs. In cases where the peak flow from the design storm exceed the street capacity, storm sewers of sufficient size to carry the excess must be installed. The minimum pipe size for underground storm drainage shall be 12 inches. The peak flow from a 50 year storm must be carried within the cross-section between buildings (front yards and street) for subdivisions served by retention basins. *The floor elevations of all habitable space shall be above flood levels equivalent to a 100 year storm.*

7. *All streets shall be vertical curb with minimum longitudinal slope as shown in the table below, designed in accordance with accepted City of Yuma Construction Standards.*

MINIMUM SLOPES

<i>Straight (400' radius & over) Curb</i>	<i>0.20%</i>
<i>Curved (Less than 400' radius) Curb</i>	<i>0.25%</i>
<i>Valley Gutter Flowline</i>	<i>0.30%</i>

8. Each retention basin shall be constructed so that storm water will not stand longer than five (5) days after termination of the storm. Basin drainage shall be accomplished by infiltration or by controlled flow into an existing facility suitable to receive, transport and dispose of storm water. When controlled flow is proposed, the owner/developer and the City of Yuma shall obtain approval from the owner of the existing facility prior to formulating final drainage plans for the retention basin. Final drainage plans shall be subject to the review and approval of the City Engineer.

9. The owner of the property on which the retention basin is to be located shall grant a right to use said property for drainage purposes.

Such grant shall be made by means of a document which shall be approved by the City Attorney and recorded in the office of the Yuma County Recorder and which shall contain the following provisions.

- a. Legal description of the property to be used for storage purposes.
- b. Legal description of the property which is permitted to drain to the basin.
- c. A statement that the owner is responsible for construction and maintenance of the basin in accordance with standards established by the City Engineer.
- d. *A statement that no habitable structure(s) may be constructed within the basin.*
- e. A statement that the property shall be used for storm water storage so long as it is required in the opinion of the City Engineer.
- f. Such other provisions as are deemed by the City Attorney to be necessary to effectuate the provisions of the Ordinance.

In lieu of the requirements contained in the previous paragraph, the owner may dedicate the property to be used for storm water retention to the City for drainage and for public use. Such dedication shall become effective only upon acceptance of the basin by the City Engineer. As conditions precedent to acceptance of dedication, the owner/developer shall include landscaping (grass and trees), an irrigation system of the flood and/or sprinkler type, and lighting as specified in approved City of Yuma Standards.

10. A retention basin, to become dedicated to the City, shall be located adjacent to arterial streets (mile and half-mile streets) and the geometrics of the basin shall be coordinated with the City Engineer.

11. *With approval of the City Engineer, a retention basin may be located on other streets which allow a direct storm sewer route to an arterial street. Additionally, properly designed and sized inlets, manholes, storm sewer lines and all other appurtenances shall be constructed to a point where the storm sewer may be connected to a future storm main on an arterial street.*

B. When on-site retention is utilized in residential subdivisions, the following design criteria shall be applicable:

1. Minimum lot size for on-site retention shall be 8,000 square feet. A deed covenant prohibiting alteration of the final site ground elevations shall be required. The maximum design depth of storm water storage on any lot shall not exceed 8 inches except as approved by the City Engineer.

2. *The lot depth below the back edge of the sidewalk shall be computed using a 100 year storm of 24 hour duration with 3.85 inches of total rainfall. An allowance for evaporation and/or percolation shall not be incorporated into the computations for minimum lot depth. Storage volume shall also be provided for adjacent streets and alleys except for arterial streets.*

3. Each lot shall be provided with an earthen berm around the back and sides of each lot. The earthen berm shall be 1 foot higher than the adjacent final ground elevation of the lot.

4. All residential streets shall have vertical curb and gutter designed in accordance with accepted City of Yuma Construction Standards. An appropriate means of transporting water into the storage area shall be provided.

5. *Slope away from building shall not exceed 20:1 for a distance of five feet out from the foundation.*

C. *When on-site retention is utilized in commercial and industrial developments, all storm water from a 100 year storm of 1 hour duration (2.25 inches) must be retained on-site. Dry wells will be permitted to drain surface retention areas. However, the infiltration cannot be considered to reduce the volume of the retention area. The City of Yuma shall not be responsible for the design, performance, operation or maintenance of dry wells or retention basins in commercial or industrial development. Dry wells shall not be located within 20 feet of any building(s).*

D. Combination storage shall consist of providing adequate storage volume for the appropriate design storm by a combination of on-site retention and a retention basin. All requirements and conditions outlined in the previous paragraphs of this section shall apply.

SECTION V. BUILDING FLOOR ELEVATIONS

A. The minimum Building Floor Elevation shall be 10 inches above the design high water elevation in the case of on-site retention or combination storage. In the case of retention basins, the minimum Building Floor Elevation shall be 10 inches above the back of curb fronting the lot.

B. The provisions of this section shall not apply to any existing building or structure nor to an expansion of less than 25% in floor area or any alteration to an existing building or structure, but in no case shall the floor elevation of the extension be below the existing floor of the habitable space.

SECTION VI. APPROVAL

A. The surface of any lot, plot or parcel of land may not be filled or substantially altered without first obtaining written approval from the City Engineer.

B. Prior to issuing written approval, the City Engineer shall require the owner/developer to submit for review a drainage plan showing existing and proposed grades together with calculations showing the volume of storage required and provided. Such plan and calculations shall be prepared under the direction of a professional engineer registered in the State of Arizona.

C. Where the alteration is proposed for a platted residential lot and where the work is to be done only on said lot, plans and calculations prepared by a professional engineer will not be required. The property owner shall submit a sketch to the Division of Building Safety showing the proposed work. The Building Official is authorized to assist the property owner in preparing such a sketch and making any computations which may be required.

D. The Division of Building Safety shall not issue a building permit until receipt of notification from the City Engineer that a drainage plan has been approved in accordance with this Ordinance.

E. The Division of Building Safety shall not issue a Certificate of Occupancy until receipt of notification from the City Engineer that construction has been completed in substantial compliance with the approved drainage plan or that subsequent completion has been guaranteed by other means acceptable to the City.

SECTION VII. PENALTY FOR VIOLATION

A. Any person violating any of the provisions of this Ordinance shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not more than three hundred dollars or by imprisonment in jail for not more than six months, or by both such fine and imprisonment. Every such person shall be deemed guilty of a separate offense for each day during which, or any portion of which, such violation continues and shall be punishable therefore as herein provided.

B. In addition to, or independent of, the penalties provided above, the City may bring a civil proceeding in a court of competent jurisdiction to enforce compliance with the terms of this Ordinance or to prevent, restrain or abate any violation of the terms of this Ordinance.

SECTION VIII. RIGHT OF APPEAL

A. The City Engineer is charged with the responsibility for administration of this Ordinance. Any person who is dissatisfied or aggrieved by an decision of the City Engineer may appeal such decision by filing written notice of appeal with the City Recorder. Said notice of appeal shall be forwarded to the City Council at its next regularly scheduled meeting at which time a date will be set for hearing on the appeal. The decision of the City Council on the appeal shall be final.

SECTION IX. EMERGENCY

A. To preserve the public peace, health and safety with the City of Yuma, it is necessary that this Ordinance become immediately operative. It is, therefore, declared to be an emergency measure and shall be exempt from the provisions of the referendum and shall take effect and become operative from and after its passage by the City Council, approval by the Mayor and publication as required by the Charter of the City of Yuma.

PASSED AND ADOPTED this 12th day of October, 1977.

APPROVED:

/s/ Ersel C. Byrd

ATTEST:

/s/ Marjorie Oliver

APPROVED AS TO FORM:

/s/ William E. Farrell
City Attorney

REVIEWED BY:

/s/ William R. McGuire
City Administrator

Publication Dates October 16, 17, 18, 1977

EXHIBIT "A"

Estimated Return Periods for Short-Duration Precipitation in Arizona
(Inches)

Station: Yuma WBO

Latitude: 32° 40'

Longitude: 114° 36'

Elevation (feet): 194

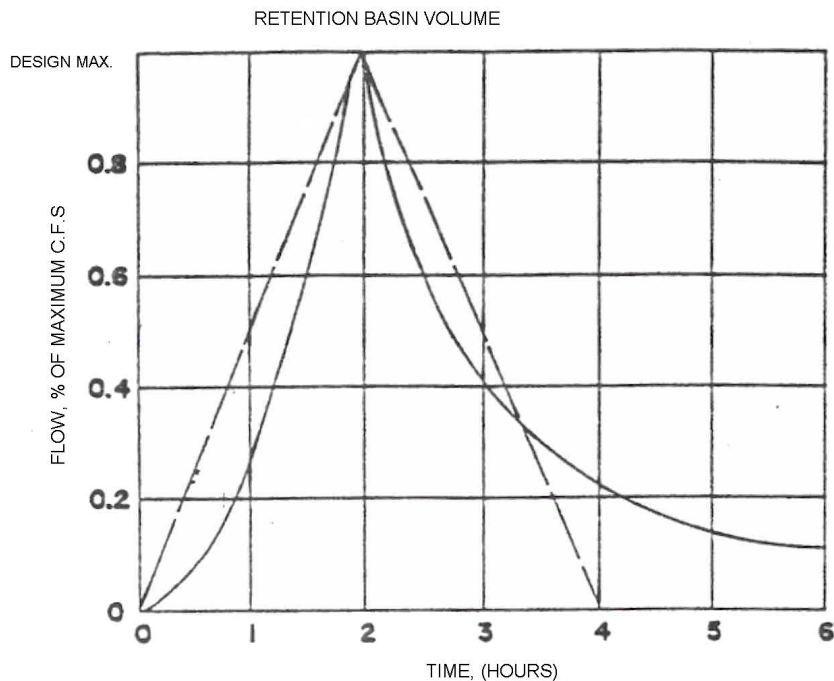
DURATION

RETURN PERIOD (YEARS)

	1	2	5	10	25	50	100
5 Min.	0.10*	0.18	0.31	0.39	0.48	0.57	0.65
10 Min.	0.16	0.28	0.49	0.61	0.75	0.88	1.01
15 Min.	0.21	0.35	0.62	0.77	0.95	1.12	1.28
30 Min.	0.28	0.49	0.85	1.07	1.32	1.55	1.78
1 hr.	0.36	0.62	1.08	1.35	1.67	1.96	2.25
2 hr.	0.38	0.66	1.15	1.45	1.81	2.12	2.43
3 hr.	0.40	0.70	1.22	1.54	1.94	2.28	2.61
6 hr.	0.44	0.80	1.40	1.78	2.26	2.66	3.05
12 hr.	0.48	0.89	1.56	1.99	2.55	3.00	3.44
24 hr.	0.52	0.98	1.72	2.21	2.85	3.36	3.85

* Note: All values shown are in inches of rainfall

EXHIBIT "B"



1. Use $Q=CIA$ where Q equals the peak rate of runoff (cfs), C equals the runoff coefficient as shown below, I equals the rainfall intensity of 1.22 inches/hour, and A equals the watershed area (acres).
2. Total runoff volume equals area under triangle = $\frac{1}{2}(4)(Q)(3600)=7200 Q$ (FT³)
3. Basin volume to be increase by either 25% or 1 ft. or freeboard, whichever is greater.

Values for Runoff Coefficient "C"

<u>Area Type</u>	<u>"C" Factor</u>
Residential (1 to 4 dwelling units/acre)	0.39
Residential (4+ dwelling units/acre)	0.43
Mobile Home Parks	0.51
High Density Dwellings (Apartments)	0.51
Parks	0.20
Agricultural	0.12