PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT
TECHNICAL POLICY

POLICY NO.: Technical Policy, TECH-001 EFFECTIVE DATE: DRAFT 10/10/25

POLICY NAME: Acceptable Methods to Demonstrate No-rise in the Base Flood Elevation

PURPOSE: To provide guidance regarding acceptable methods to demonstrate when a proposed use or development meets the federal requirements under Code of Federal Regulations (CFR) Title 44 Section 60.3 (No-rise Criteria) and the Pima County Floodplain Management Ordinance (Ordinance). This document does not discuss methods of delineating a floodway.

BACKGROUND: Title 44, Part 60, Section 60.3(d)(3) of the CFR requires a participating community to administer floodways in a manner that:

> "Prohibit(s) encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge".

This requirement from the CFR is known as the "No-rise Criteria".

The Ordinance reinforces the FEMA no-rise criteria under 16.24.020:

> **16.24.020 Prohibited Uses in a floodway.**
> No use shall be allowed which:
> C. Increases the base flood elevations, as certified by an Arizona registered civil engineer.

In addition, the District has an interest in ensuring that all levee and constructed channel freeboard requirements remain met.

POLICY:

I. Applicability

1. Within unincorporated Pima County, regulatory floodways include those designated by FEMA on Flood Insurance Rate Maps and locally designated floodways as defined in the Ordinance,
2. Within a regulatory floodplain that may impact the freeboard of flood control infrastructure,
3. Development that is not prohibited within a floodway under 16.24.020, particularly but not exclusively 16.24.050.f, which prohibits fill, structures or storage of materials for a period of greater than 180 days. Replacement of a structure in a floodway is considered new construction and as such would be prohibited under 16.24.020, regardless of the no-rise criteria.

II. Exemptions

1. The District has determined that the following uses of the floodway cause a *de minimis* impact to base flood elevations and, therefore, are not subject to this policy:

    a. Single or isolated vertical post such as a power or telephone pole, a sign post, guy wire, or fence post. This does not include a pier supporting a structure.

    b. Stranded wire fence with no more than four strands of wire that is parallel to flow or designed to lay down during the base flood

    c. Pavement nominally at-grade such as a driveway or parking lot

    d. At-grade crossings of a regulatory wash, provided the crossing is constructed in accordance with Technical Policy 027, Figure 027-A or 027-B.

    e. Development that is entirely below grade and buried below maximum anticipated scour depth.

    f. Excavation required to create compensatory features designed to offset encroachments per section III.3.f.

III. Requirements for Development and Demonstration of No-rise

1. Regulatory floodways typically contain the highest flow concentration, and therefore the highest flow velocities and depths. Levees and constructed channels are designed to protect low-lying areas and often have freeboard requirements. The applicant must first strive to relocate the development out of the regulatory floodway or the portion of the floodplain that would impact the performance of any infrastructure with a freeboard requirement.
2. If other alternatives are not feasible, and development must occur within the regulatory floodway or in the portion of the floodplain that could impact the freeboard requirements of flood control infrastructure, it must meet the No-rise Criteria. FEMA guidance states that the No-rise Criteria means absolute zero rise in the base flood elevation (BFE) due to the new development. This demonstration must be documented in a drainage report, sealed by an Arizona-registered Civil Engineer, which is submitted to the District for review and approval. This approved drainage report serves as the No-rise Certificate, and a copy is to be maintained in perpetuity by the District.

3. The following methods are acceptable to demonstrate that the No-rise Criteria is met:

    a. Development is exempt under section II above;

    b. Placement of new development wholly within the upstream or downstream flow shadow (also referred to as conveyance shadow) of an existing, permitted or grandfathered structure, or natural flow obstruction;

c. Placement of new development within an area which is demonstrated to be dry during the passage of the base flood;

d. Replacement of an existing development with new development which is contained within the footprint of the existing permitted or grandfathered development;

e. Removal of an existing conforming use (permitted or grandfathered development) that offsets the encroachment from new development. The new development must be development that is not otherwise prohibited in a floodway. The new and removed development must be in the immediate vicinity of each other.;

f. Incorporation of permanent features into the project which compensate for loss of conveyance due to the development at a 1.5 to 1 ratio. Compensatory features must:

   i. be in the immediate vicinity of the development and be proven to eliminate any rise in the BFE;

   ii. provide effective conveyance (i.e., added conveyance due to a proposed feature must continue upstream and downstream to properly transition out of, and back into, the conveyance); and

   iii. be maintained either through maintenance agreement with local municipality or through a recorded covenant assigning maintenance responsibility to the property owner, subject to all penalties of a violation of the Ordinance for failure to maintain the features;

g. Hydraulic models of the floodplain to compare pre- and post-project BFEs and floodway profiles (if applicable). Modeling must account for debris loading.

   i. Models must account for backwater effects and must evaluate energy losses due to changes in velocity head

   ii. Modeling must use District accepted methodologies and follow accepted engineering practice and modeling guidelines for the selected modeling software package; and

   iii. Progression of modeling effort shall include:

      1. Obtain a copy of the current model which is the basis for the effective profile and floodway designation;

      2. Reproduce the results of the effective profile and floodway designation using the latest version of the selected modeling software package (called Duplicative Effective Model);

      3. Correct all technical modeling errors and add to the model all changes that occurred prior to the date of the effective model (Corrected Effective Model);

4. To the Corrected Effective Model, add all changes to the conveyance which have occurred since the date of the effective model, to include additional cross sections necessary to properly model the proposed project. These additional cross sections will be based on recent survey and will show pre-project floodplain conditions (called Existing Conditions Model);

5. Modify the Existing Conditions Model to show the effective profile and floodway designation under proposed development (called the Proposed Conditions Model);

6. Modify the configuration of the proposed development to show zero (i.e., 0.00 ft) increase in both the profile and BFE at any location beyond the immediate vicinity of the proposed development.

APPROVED BY:

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Eric Shepp, P.E. Date
Director and Chief Engineer

Original Policy Approved:
Date(s) Revised:

REFERENCES

Guidance for Flood Risk Analysis and Mapping, Floodway Analysis and Mapping, FEMA Guidance Document #79, November 2019

PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT
TECHNICAL POLICY

POLICY NO.: Technical Policy, TECH-002 EFFECTIVE DATE: DRAFT 10/10/25

POLICY NAME: Allowable Methods of Post-Construction Flood Protection for Structures

PURPOSE: To document acceptable methods of providing flood protection for non-compliant structures with a lowest floor located below the Regulatory Flood Elevation (RFE). This policy does not discuss foundation erosion protection, which may also be required; refer to Technical Policy 014 *Erosion Protection of Stem Walls*, or Technical Policy 006 *Erosion Protection of Fill Pads*. This policy also does not apply to manufactured housing (MH), since MH flood protection will be accomplished by raising the bottom of the structural frame to or above the RFE using standard MH installation details. Refer to Technical Policy 003 – *MH Construction Policy*.

BACKGROUND:

There are several scenarios through which a structure might have a lowest floor that is not elevated at or above the RFE:

1. **A habitable structure was constructed or is under construction in a floodplain either;**
   a. **without an approved Floodplain Use Permit (FPUP)**
   b. **incorrectly constructed below the required elevation,**
   c. **at a different location than permitted, resulting in the structure being located wholly or partially within a flood hazard area or in a higher flood hazard area the approved location. or**
   d. **a non-habitable structure converted into a habitable structure without an approved FPUP.**

In scenario 1, the structure is considered a violation and the structure or property must be modified in order to achieve compliance with the Ordinance per the options provided in Sections I or III.

2. **A habitable or non-habitable structure was constructed in compliance at the time of construction, including structures constructed prior to floodplain regulations or floodplain mapping, but is no longer compliant due to either;**
   a. **new floodplain mapping identified at the building location, or**
   b. **an increase in the RFE within a mapped floodplain at the building location**.

In scenario 2, the structure is considered a legal non-conforming use and no modification is required since the structure is grandfathered. The owner(s) may desire to reduce or eliminate the flood risk to their structure by following this policy. Since compliance is not mandated, there are options available in this scenario that are not available in the other scenarios in which compliance is required.

3. **A structure used exclusively for limited storage or parking was constructed that has a lowest floor elevation below the RFE.**

In scenario 3, the structure will either need to be floodproofed or elevated. This Policy outlines acceptable methods of providing flood protection to these structures. There are options available in this scenario that are not available for habitable structures.

POLICY:

This policy refers to structures as either habitable or non-habitable. Habitable structures are those that are used for any use other than limited storage and parking. Non-habitable structures are those that are used exclusively for limited storage and parking.

This Policy is intended primarily to address issues related to structures with a lowest floor elevation below the RFE, possibly to achieve compliance for a structure. There may be other factors in addition to the aforementioned issue that must be addressed to achieve compliance. For example, depending on the method chosen above and case specific details, it may also be necessary to protect the foundation of the structure from scour and/or lateral migration of a regulatory watercourse. The specifics of these other requirements are not covered by this Technical Policy.

I. Habitable Structure Not Elevated in Compliance

FEMA regulations prohibit wet- or dry-floodproofing a habitable structure. Therefore, the following methods of achieving compliance are acceptable for a constructed or under construction non-compliant habitable structure:

A. relocate the structure out of the floodplain,

B. raise the lowest floor to or above the RFE. This can be accomplished by either raising the existing structure in its entirety, increasing the floor height by adding concrete or constructing a new floor with a crawl space that meets all requirements for a structure constructed on a crawl space foundation per Technical Policy 022. This also requires the use of only floodproof materials below the RFE per Technical Policy 021.

C. construct channel modifications designed to reduce the RFE below the lowest floor.

D. construct channel modifications designed to remove the structure from the floodplain

1. if the structure is on a stem wall foundation or piers, the modified floodplain must not touch the foundation of the structure;
2. if the structure is on a fill pad,

    a. the Base Flood Elevation (BFE) of the modified floodplain must be below the elevation of the top of the fill pad at a minimum distance of 10 ft min beyond the exterior walls of the structure, the top of the fill pad must slope 2% (min) away from the foundation for drainage and the FFE must be at or above the RFE; or
    b. If good pre-project topography is available, it may be used to propose channel modifications to remove the footprint of the structure from the pre-project floodplain.

E. Channel modifications via I.C. or I.D. above are subject to the following requirements.

1. Modified FEMA Special Flood Hazard Area floodplain limits require a Letter of Map Change to be submitted to and approved by FEMA.
2. Modified local floodplain limits due to channel modifications must be memorialized by altering the floodplain map. If the local floodplain is shown on a plat, a plat-change covenant is required.
3. Channel modifications cannot shift flows onto adjacent parcels, nor cause adverse impact on adjacent parcels.
4. Channel modifications must be documented in a drainage report and design plans sealed by an Arizona registered civil engineer which is submitted to the District for review and approval.
5. Channel modifications must be placed within a private drainage easement.
6. Owner must sign covenants accepting responsibility for maintenance of the private drainage improvements.
7. Channel modifications require a sealed as-built certification by the engineer of record.

F. Some combination of the methods in I.B. and I.C.

G. Convert the structure to a structure used solely for limited parking and storage and make all necessary alterations to the structure to achieve compliance for this type of structure, such as floodproof materials up to the RFE and meet applicable flood opening requirements in the walls of the structure. See Section III.

II. Non-conforming Habitable Structure not Elevated per Current Regulations

The following additional methods are acceptable for protecting a non-conforming use structure which was built with a permit, but now is in a flood hazard area or is in an increased flood hazard area. Note that although the methods below may reduce or eliminate the flood hazard from the structure, the implementation of these methods does not alter the non-conforming status of the structure. Non-conforming use requirements still apply with respect to improvements or damages caused by any origin to the structure. The methods below may not be used when the non-conforming use rules require the structure to be brought into full compliance. Similarly, the methods below cannot be used when a non-habitable structure is converted into a habitable structure. The acceptable methods are:

A. Any method provided in Section I.

B. Construction of any combination of earthen berm or levee, flood wall, swale or channel modification to reduce the structures flood risk.

1. The degree of protection provided is not proscribed by the District and does not necessarily have to protect the structure from the 1% annual chance (100-year) flood.
2. An analysis by an Arizona registered civil engineer (Report) may be required to demonstrate what level of protection the improvements provide and that any drainage modifications will not cause an adverse impact to adjacent parcels.
3. If a Report is required by the District, the construction shall require a sealed as-built certification by the engineer of record.

III. Non-habitable Structure Not Built in Compliance

The following methods of flood protection are acceptable for a structure constructed with or without a permit which is used for solely for limited storage or parking that has the lowest floor below the RFE. If the use of the structure includes anything other than limited storage and parking the policy guidelines presented above under Section I apply.

A. The structure can be made compliant using one of the methods in Section I above.

B. The structure can be made compliant by wet floodproofing the structure in accordance with the Technical Policies below;

1. Technical Policy 021 Use of Flood Resistant Materials Below the RFE
2. Technical Policy 022 Use of Flood Openings Below the RFE
3. Technical Policy 023 Allowable Uses of Structures with Flood Openings

C. The structure can be made compliant by dry floodproofing the structure. This method requires a report and design sealed by an Arizona registered civil engineer and a maintenance plan.

APPROVED BY:

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Eric Shepp, P.E.
Director Date
Chief Engineer

Original Policy Approved:
Date(s) Revised: