

PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT TECHNICAL POLICY

POLICY NO.: Technical Policy, TECH-005

EFFECTIVE DATE: November 5, 2007
REVISED: 5/18/21

POLICY TITLE: Construction Standards for Fences and Walls within Regulatory Floodplains

PURPOSE: To clarify 16.20.020.C.5 by establishing guidelines regarding the design and construction of fencing and walls that may be approvable without providing an engineering study demonstrating no adverse impact (i.e. encroachment criteria have been met).

BACKGROUND:

Due to the typical amount of area enclosed and location on or near property boundaries, fences (wire, wrought iron, woven wire, chain-link, wood, sheet steel, etc.) and walls (masonry, block, etc.), hereafter collectively called fences/walls, have the potential to significantly impact flood flows to the adverse impact of adjacent properties and the floodplain in general. In addition to their impact to floodplains, the structural failure of fences/walls not designed to pass floods or withstand flood forces have caused structures to flood that otherwise may not have flooded. Floodplain Management Ordinance provision 16.20.020.C states that an applicant proposing new development may be required to provide an engineering report prepared by an Arizona-registered civil engineer outlining the effects that the development will have on the flow of flood waters through the area being developed and through surrounding areas. If an engineering study reasonably demonstrates that there is no adverse impact (i.e. meets encroachment criteria), a Floodplain Use Permit (FPUP) may be issued for the new development. In many cases, fences and walls can be reasonably assured to have a negligible impact on flood waters through the use of certain construction and design standards without the need for an engineering analysis.

An FPUP is required for construction of any fence/wall within a regulatory floodplain in order to ensure compliance with the Ordinance. Depending on the nature of the flood hazard at the site and the proposed characteristics of the fence/wall, the District may accept certain fence/wall configurations without requiring an engineering study. As a basic starting point, the fence/wall types allowed for each flood hazard area can be found on the attached table titled: FLOODPLAIN MANAGEMENT PRACTICES FOR FENCES / WALLS.

In 2020, this policy was revised to add additional clarity, consistency and address rule changes or clarifications from local, state and federal agencies. New sections were added related to floodways, pool enclosures and wrought iron fences.

POLICY:

As a matter of good floodplain management practices, it is *preferable* that all fences and walls within floodprone areas be elevated at or above the Base Flood Elevation (BFE). The minimum standard is that fences/walls may not adversely impact adjacent properties. This policy dictates when elevating or creating openings in a fence or wall is required and also establishes when the standard design criteria presented in this policy may be used in lieu of an engineering analysis or an engineered design. The allowed fence/wall configurations are summarized for each type of flood hazard area on the attached Table titled: FLOODPLAIN MANAGEMENT PRACTICES FOR FENCES / WALLS, effective January 13, 1994, and revised December 11, 2018. Designs that meet the standards outlined below may be approved by the District without an engineering study unless uncertain, unusual, or high hazard conditions exist.

Fences and walls within regulatory Flow Corridors are further subject to the provisions of *Technical Policy 026: Regulation of Single-Lot Development within Flow Corridors*, which modifies some of the requirements within this policy.

A. Fences/Walls within Floodways

The FEMA guidance document titled *Certification Requirements for Simple Floodway Encroachments* states, “. . . nothing that offers any resistance to the flow of floodwaters may be placed in a regulatory floodway unless compensatory action is taken to restore the lost conveyance.” As such:

1. Walls and solid fences are not allowed in a floodway
2. Open, pipe rail, wrought iron and woven wire fence are allowed over the channel of a minor regulatory watercourse when constructed as detailed in B.6 and Figure 005-1.
3. Except as provided in A.3, any fence or wall proposed within a floodway area must:
 - a. meet the requirements in Sections B through J of this policy, and
 - b. be justified by an engineering analysis prepared by an Arizona registered civil engineer that:
 - i. Addresses debris loading on the fence/wall, and
 - ii. Addresses compensatory conveyance of flood flows, and
 - iii. Demonstrates that the improvements cause no rise in the base flood elevation.
4. The Ordinance establishes that the primary channel of any regulatory watercourse is considered to be a floodway, however the District may waive the requirements above when all of the following conditions are met:
 - a. Sections B through J of this policy are met,
 - b. the floodway is designated such solely under Section 16.08.350.C of the Ordinance, expressly that the floodway is the primary channel of a minor regulatory watercourse with a discharge less than 2,000 cfs, and
 - c. the portion of the fence within the channel is solely 3 or 4 strand barbed or barbless wire.

B. All Fences/Walls

The requirements in this section apply to all fences and walls.

1. The FPUP application must be accompanied by a site plan of the property, to a measurable scale, which meets all of the requirements of 16.20.020, including showing all existing and proposed development, existing and proposed grading, topography, and floodplain/erosion hazard setback delineations.
2. The site plan must also show the proposed fence/wall location in relation to the property boundaries, as well as a dimensioned elevation view detail showing the height of the bottom of the fence/wall above natural grade and/or flood openings or a reference to one of the standard details in this Policy, if applicable. The site plan must indicate the location and size of any required flood openings, and demonstrate that these flood openings are aligned with similar flood openings on adjacent properties (if existing).
3. Approval of the FPUP shall require the signing of a covenant stipulating that all flood openings will be kept free of debris at all times and remain open for the passage of floodwaters and/or that fences/walls will be elevated and kept free of debris, as applicable. The property owner must also acknowledge that if the fence/wall poses a flood hazard at any time in the future, the fence/wall shall be modified at the owner’s expense to eliminate the hazard.
4. Fences/walls that are intended to contain livestock are not allowed in the channel of a regulatory wash.
5. Single strands of wire may be placed below the bottom of a fence/wall at six inch intervals, except within the channel of a regulatory wash.
 - a. The lowest strand shall be at least six inches above natural grade (natural grade is not to be altered).
 - b. The highest strand shall be at least six inches below the bottom of the fence.

- c. For example, if the fence is elevated one foot above grade, a single strand is allowed below the bottom of the fence. One additional strand is allowed for each additional 6 inches that the fence is elevated.
6. For any type of fence other than a fence that meets the definition of open fencing in Section D, if the fence is across a regulatory wash, the bottom of the fence shall be elevated at or above the Base Flood Elevation (BFE). In floodplains such as sheetflow floodplains where the BFE is a depth of flow, the point of measurement for the bottom of the fence across the channel shall be the highest bank of the wash (see Figure 005-1).
 - a. Vertical support posts are not allowed within the channel.
 - b. Nothing is allowed below the bottom of the fence within the channel, except as provided in B.7 and B.8.
7. Trash racks or any kind of mesh screening are not allowed within the channel of a regulatory wash unless the following conditions are met:
 - a. The trash rack or screening is offset at least 25 feet from any property boundary for washes with a base flood discharge of less than 2000 cubic feet per second (cfs),
 - b. The trash rack or screening is offset at least 50 feet from any property boundary for washes with a base flood discharge of 2000 cfs to less than 5000 cfs,
 - c. Trash racks or screens are not allowed on washes with a discharge of 5000 cfs or more.
8. Flap gates, flip gates, or similar type designs are prohibited within regulatory washes unless a design by an Arizona registered civil engineer is approved by the District. Flap gates are commonly desired as a solution to allow the passage of floodwaters while preventing unwanted entry of wildlife or exit of domestic pets through the open space required by this policy. However, they often fail to perform as intended and as a result, divert, obstruct or retard flow.
9. Natural flow paths must be preserved and design considerations must be made to accommodate flow based on the type of fence/wall being constructed.
10. The requirements of Technical Policy 026 shall be applied to fences and walls within Flow Corridors.

C. Special Considerations for Pool Enclosures

For below-ground pools and above-ground pools less than four feet tall, Building Code safety requirements dictate that pool barriers are required and that the barrier shall not allow the passage of a 4-inch diameter sphere. This often conflicts with District requirements for opening sizes. In addition, the pool code requires the bottom of a pool enclosure fence to be no more than two inches above grade when grade is earth, as opposed to a hardscape surface such as block or concrete. The bottom of a pool enclosure may be four inches above grade when grade is hardscaped, such as concrete. However, when properly spaced rebar is placed in wall openings, the top of a wall opening may be more than four inches above grade when grade is a hardscape surface. Pool safety guidelines also restrict the use of horizontal bars since they may be used as steps to scale the fence/wall. When a pool enclosure is proposed within a regulatory floodplain and this policy requires that flood openings or elevating the bottom of the fence are necessary, the following shall apply (see also Figure 005-3):

1. When a solid fence or block wall with openings is acceptable and the District determines that the top of flood openings must be higher than four inches above grade, the standard details for the wall openings shall be modified as follows.
 - a. Openings shall be constructed with rebar placed in the openings.
 - b. The rebar shall be oriented vertically so as to not offer a step to get over the wall.
 - c. The rebar shall be spaced four inches apart, on center.
 - d. The District may require more openings or larger openings in order to compensate for the less than optimal rebar orientation and spacing.
2. When a block wall is acceptable and the District determines that the top of the flood openings are allowed to be four inches above grade, the top of the opening shall be exactly four inches above natural grade in order to keep the bottom of the fence as high as possible within the limits of the pool safety requirements.
 - a. As a result, the area below the fence must be hardscape and cannot be dirt or loose rock.

- b. A concrete footer, block, or concrete slab is acceptable under the fence to meet the 4 inch opening requirement. It is recommended that applicants verify the acceptability of any other materials with Development Services.
 - c. The District may restrict the use of rebar or other materials within the flood openings.
 - d. The District may require more openings or larger openings in order to compensate for the less than optimal flood opening size.
3. The District may require an alteration of the size or configuration of the fence to offset the reduced capacity to pass flows through the fence/wall caused by the pool enclosure safety requirements.
 4. The District may require flow-through fencing or wrought iron to be used in lieu of a solid fence or block wall.

D. Open Fences

Open fences, which includes most pipe rail fences and 3 or 4 strand barbed/barbless wire fences, are subject to District approval and are generally considered to be the preferred fencing type within a floodplain. To qualify as open fencing, the fencing cannot occupy more than 10% of the flow area obstructed by the fence. With respect to open fences, the following standards must be met:

1. Meets the provisions of Sections A and B of this policy.
2. Fence posts or vertical wires or stays shall be placed no closer than 6 feet apart for stranded wire fence
3. Fence posts shall be placed no closer than 8 feet apart for pipe rail type fence
4. Fence posts may not be placed in the primary channel of a regulatory wash
5. Not allowed in the primary channel if the purpose of the fence is to contain livestock
6. All fencing across the channel of a major regulatory watercourse (having a base flood discharge of 2,000 cfs or greater) must be supported by an engineering analysis as detailed in Section A of this policy.
7. The only fencing type allowed across the channel of a minor regulatory watercourse (having a base flood discharge of less than 2,000 cfs) is 3 or 4 strand barbed or barbless wire. All other provisions of this Section must be met.

An engineering analysis demonstrating no adverse impact may be provided to the District for approval in lieu of meeting the standards above.

E. Wrought Iron Fences

Wrought iron fences are subject to District approval. Since the bars of wrought iron fences are typically in a vertical orientation, they are prone to catching debris carried by floodwaters. In terms of the degree of floodplain impact, wrought iron fences are in between open fences and woven wire fences. In order to construct a wrought iron fence, the following standards must be met:

1. Meet the provisions of Sections A and B of this policy.
2. Elevate the bottom of the wrought iron fence at or above the BFE, **or**
3. If not elevated at or above the BFE, setbacks from property lines for wrought iron fence aligned perpendicular to the direction of flow are as follows:
 - a. At least 5 feet where flow depths are 1 foot or less
 - b. At least 10 feet where flow depths are greater than 1 foot but less than 3 feet.
 - c. At least 15 feet where low depths are 3 feet or greater.
4. If not elevated at or above the BFE, setbacks from property lines for wrought iron fence aligned parallel to the direction of flow are as follows:
 - a. Zero (0) feet where flow depths are 1 foot or less
 - b. At least 5 feet where flow depths are greater than 1 foot but less than 3 feet.
 - c. At least 10 feet where flow depths are 3 feet or greater.
5. Any portion of a wrought iron fence not meeting the above setback requirements shall be elevated such that the lowest part of the fence is elevated at or above the BFE.

An engineering analysis demonstrating no adverse impact may be provided to the District for approval in lieu of meeting the standards above.

F. Woven Wire Fences

Woven wire fence, which includes chain-link fence, field fence, and chicken wire fence, are subject to District approval and can be deceptively hazardous in floodplains. While they are not solid obstructions to flow like a wall, they easily catch debris carried by floodwaters. As such they may divert and obstruct flow just like a wall. Hydrodynamic pressure on the trapped debris also applies forces to fences that they are not designed to withstand, causing them to fail in a hazardous manner. In order to construct a woven wire fence, the following standards must be met:

1. Meet the provisions of Sections A and B of this policy.
2. Elevate the bottom of the woven wire fence at or above the BFE, **or**
3. If not elevated at or above the BFE, woven wire fence aligned perpendicular to the direction of flow shall be set back as follows:
 - a. At least 20 feet from the upstream property boundary and at least 10 feet from the downstream property boundary where flow depths are 1 foot or less
 - b. At least 30 feet from the upstream property boundary and at least 15 feet from the downstream property boundary where flow depths are greater than 1 foot but less than 3 feet.
 - c. At least 40 feet from the upstream property boundary and at least 20 feet from the downstream property boundary where low depths are 3 feet or greater..
4. If not elevated at or above the BFE, woven wire fence aligned parallel to the direction of flow shall be set back from any property boundary as follows:
 - a. At least 5 feet where flow depths are 1 foot or less
 - b. At least 10 feet where flow depths are greater than 1 foot but less than 3 feet.
 - c. At least 15 feet where flow depths are 3 feet or greater.

An engineering analysis demonstrating no adverse impact may be provided to the District for approval in lieu of meeting the standards above.

G. Solid Fences and Walls without Flood Openings (50 Feet or More from Property Boundaries)

Subject to District approval, with consideration for natural drainage, in order to construct a solid fence or wall without flood openings and without an engineering study, the following standards must be met:

1. Meet the provisions of Sections A and B of this policy.
2. The fence/wall shall be offset from all property boundaries by a minimum of 50 feet.
3. The total flow obstruction shall not exceed 50% of the extent of the floodplain impacting the property as measured perpendicular to the direction of flow, considered cumulatively with all other manmade obstructions to flow on the property (i.e. structures, fill, other fences/walls, elevated driveways, etc.).
4. For properties smaller than 1 acre, less than 50% of the total area of the property subject to flooding is enclosed or obstructed.
5. For properties larger than 1 acre, no more than 22,000 square feet of the subject property is enclosed.
6. The fence/wall shall not be placed at grade across a drainage path.

H. Solid Fences and Walls with Flood Openings (25-50 Feet from Property Boundaries)

Subject to District approval, with consideration for natural drainage, in order to construct a solid fence or wall within 25-50 feet of a property boundary without an engineering study, the following standards must be met (see also Figures 005-2 and 005-3):

1. Meet the provisions of Sections A and B of this policy.

2. The solid fence or wall must be offset from all property boundaries by a minimum of 25 feet.
3. The solid fence or wall must contain flood openings that comprise at least 50% of the total fence/wall length. The bottom of flood openings shall be at natural grade, and utilize one of the following standards:
 - a. Alternating panels of solid fence/wall and panels of wrought iron fence, subject to the following minimum standards (see also Figure 005-2):
 - i. At least 50% of the linear length of the wall shall be wrought iron panels,
 - ii. Wrought iron panels shall be relatively evenly distributed along the entire length of the wall, though may be concentrated where more flow is expected,
 - iii. The bottom horizontal member of the wrought iron fence panel must be at least six inches above grade (or four inches above grade if the fence/wall is a pool enclosure),
 - iv. The solid portions of the wrought iron fence located below BFE shall occupy 20% or less of the flow area for an assumed 2 foot flow depth, **or**
 - b. A solid fence/wall with flood openings, subject to the following minimum standards (see also Figure 005-3):
 - i. The bottom of all openings shall be at natural grade.
 - ii. The top of all openings shall be at or above the BFE. If pet containment within the fence/wall is desired, flood openings may be fitted with horizontal bars (3/8 inch max diameter) spaced no closer than 6 inches vertically (to be replaced with vertically oriented bars with 4 inches of horizontal spacing if fence/wall is a pool enclosure). (See Figure 005-3 Details B or C)
 - iii. Where the BFE is six inches or less, flood openings shall be a minimum of one full course of block high or a minimum of 8 inches, whichever is greater, above natural grade and be a minimum of two blocks wide or a minimum of 32 inches, whichever is greater.
 - iv. Where BFE flood depths are greater than six inches, flood openings shall be a minimum of two full courses of block high or a minimum of 16 inches) above natural grade, or to the BFE, whichever is greater, and be a minimum of two blocks wide or a minimum of 32 inches, whichever is greater.
4. Where the solid fence or wall crosses existing drainage paths only wrought iron or open type fences are allowed. The bottom of the fence crossing the drainage path shall be elevated above the defined drainage path to the height of the bank of the defined drainage path or above the BFE, whichever is higher. There shall be no vertical posts within the defined drainage path.
5. For the purpose of facilitating passage of flood flow through adjacent lots, the flood openings on one property shall be generally aligned with the flood openings (if existing) on adjacent properties.

The pertinent hydraulic features of this acceptable fence/wall are summarized on Figures 005-2 and 005-3, and are for hydraulic design purposes only; structural design of the fence/wall is the responsibility of the applicant.

I. Solid Fences and Elevated Walls (Within 25 Feet of Property Boundaries)

Subject to District approval, with consideration for natural drainage, in order to construct a fence/wall within 25 feet of any property boundary without an engineering study, the following standards must be met.

1. Meet the provisions of Sections A and B of this policy.
2. Any portion of the fence/wall within 25 feet of a property boundary must be elevated at or above the BFE;
3. Vertical posts/pillars supporting the fence/wall shall be:
 - a. Spaced no closer than 8 feet apart (measured from center to center),
 - b. If masonry, no more than 16 inches wide
 - c. If solid fence, no more than 6 inches wide.
4. If masonry, submittal of a sealed report or design by a structural engineer is required demonstrating that the wall is structurally sound. This report does not need to address the impact to or from

floodwaters, but is necessary to demonstrate that the structural design for the large openings is sufficient to maintain the structural integrity of the wall.

5. Where the solid fence/wall crosses existing drainage paths or regulatory washes only wrought iron or open type fences are allowed. The bottom of the wrought iron fence crossing the defined drainage path shall be elevated above the defined drainage path to the height of the bank of the defined drainage path or above the BFE, whichever is higher. There shall be no vertical posts within the drainage path or wash channel.

J. Solid Fences and Walls that Do Not Satisfy the Standards of this Policy

Proposed fences/walls that do not meet the standards described above shall require the submittal of an engineering report for District approval that addresses the following (at a minimum):

1. The study must demonstrate that the fence/wall does not adversely impact any adjacent property by showing that:
 - a. The fence/wall does not increase the BFE by more than 0.1 feet, as measured at property boundaries,
 - b. The fence/wall does not increase the base flood velocity by more than 1 foot per second or 10%, whichever is less, as measured at property boundaries,
 - c. The fence/wall does not increase the potential for erosion on any adjacent property, and
 - d. The fence/wall does not divert flow, meaning that flood waters enter and exit the subject property in substantially the same location and under identical flow conditions after the fence/wall is constructed as it did before the fence/wall was constructed
2. The site plan must include a detail of the fence/wall design, a detail of any flood openings and the total number and location of the flood openings.
3. The site plan must be sealed by the engineer of record
4. The FPUP will be conditioned upon the requirement that an as-built certification letter from an Arizona-registered civil engineer be provided to the District upon completion of the work, confirming that the fence/wall was constructed in accordance with the FPUP, the engineering study, and the site plan.

APPROVED BY:



Suzanne Shields, P.E.
Director and Chief Engineer

5/19/21

Date

Original Policy Approved: 11/5/07

Date(s) Revised: 11/2/15, 11/17/20, 5/18/21

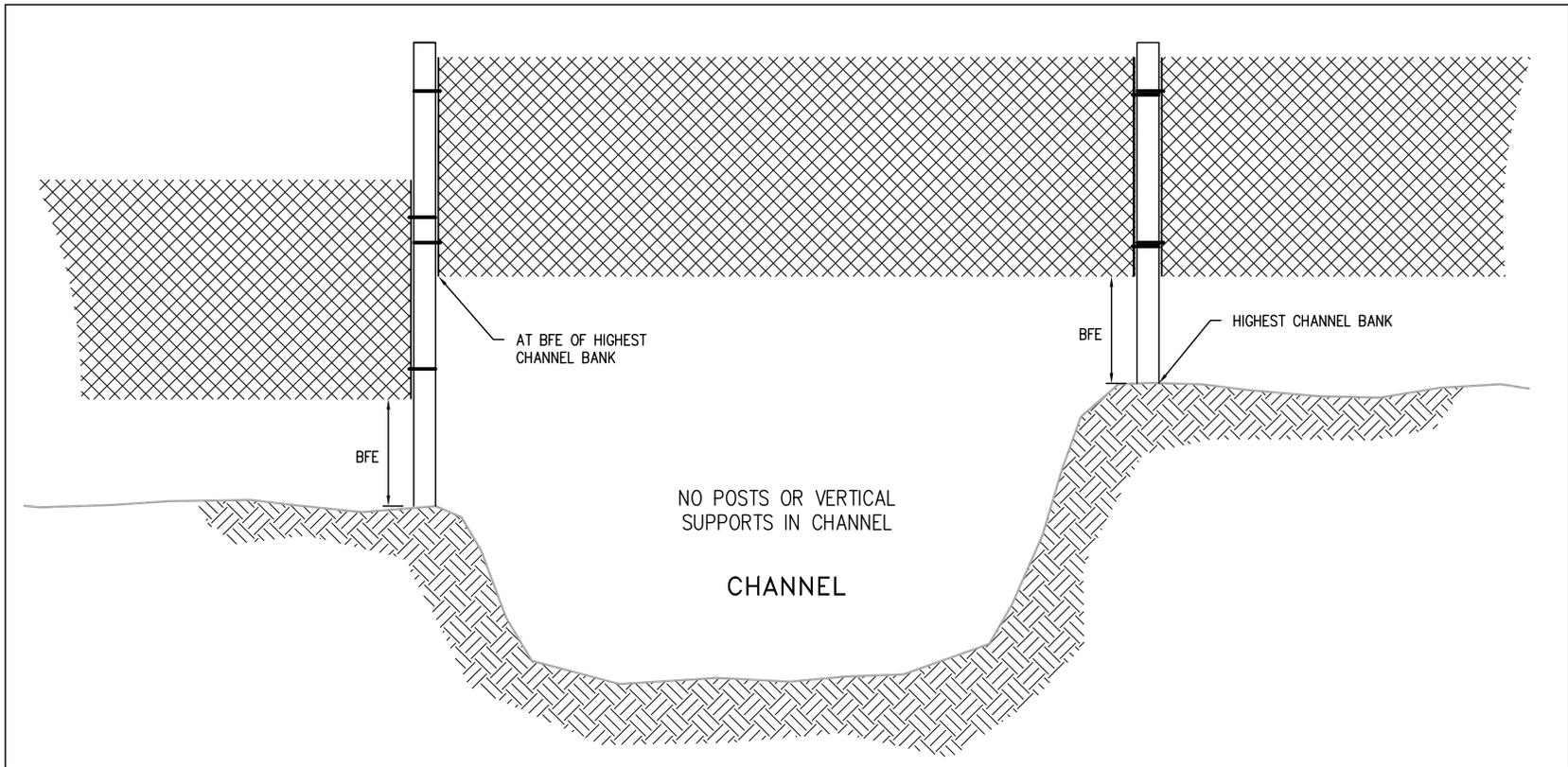
FLOODPLAIN MANAGEMENT PRACTICES FOR FENCES / WALLS IN REGULATORY FLOODPLAINS

TYPE OF FENCE, WALL (see below)	FLOOD HAZARD AREA IN WHICH FENCE / WALL IS CONSTRUCTED					
	FLOODWAY FRINGE (Ordinance 16.08.360)	FLOODWAY (Ordinance 16.08.350)	PRIMARY CHANNEL (Q100 < 2000 CFS)	PRIMARY CHANNEL (Q100 = 2000 CFS or greater)	SHALLOW SHEET FLOW (Ordinance 16.08.640)	PONDING AREA (FEMA Zone AH, areas with Limited Velocity)
	Conditions for Permitting					
A	Allowed	Allowed (No-Rise Certification required)	Allowed unless the purpose of the fencing is to contain livestock, and subject to other standards in Technical Policy 005	Allowed (No-Rise Certification required)	Allowed	Allowed
B	Allowed	Allowed with limited cross fencing (No-Rise Certification required)	Allowed subject to standards in Technical Policy 005	Not Allowed	Allowed	Allowed
C	Case by case review of design required	Case by case review of design required (No-Rise Certification required)	Not Allowed	Not Allowed	Case by case review of design required	Case by case review of design required
D	Allowed subject to standards in Technical Policy 005	Case by case review of design required. (No-Rise Certification required)	Allowed elevated to the BFE subject to standards in Technical Policy 005	Not Allowed	Allowed subject to standards in Technical Policy 005	Allowed
E	Allowed subject to standards in Technical Policy 005	Not Allowed	Allowed elevated to the BFE subject to standards in Technical Policy 005	Not Allowed	Allowed subject to standards in Technical Policy 005	Allowed
F	Allowed subject to standards in Technical Policy 005	Not Allowed	Not Allowed	Not Allowed	Allowed subject to standards in Technical Policy 005	Allowed subject to standards in Technical Policy 005

TYPE OF FENCE, WALL

A	"Open" barbed or barbless wire. For floodplain management purposes barbed or barbless wire will be considered "open" if there is no more than one horizontal strand per foot of height and no more than one vertical wire, stay, or post per six feet of fence length.
B	"Open pipe or rail fencing (e.g., corrals). For floodplain management purposes pipe fencing will be considered "open" if the horizontal pipes or rails occupy ten percent (10%) or less of the flow area obstructed by the fence, and posts are spaced no closer than 8 feet.
C	Collapsible (movable) fencing.
D	Other wire, pipe, wrought iron, or rail type fencing (e.g., wood rail fence) which does not meet the "open" requirements described above.
E	Woven wire fencing (chain-link, field, ranch, chicken wire, etc.).
F	Solid fences/walls (masonry (block) walls, wood or steel sheet fencing)

Date: Revised 4/16/2021



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5/19/21

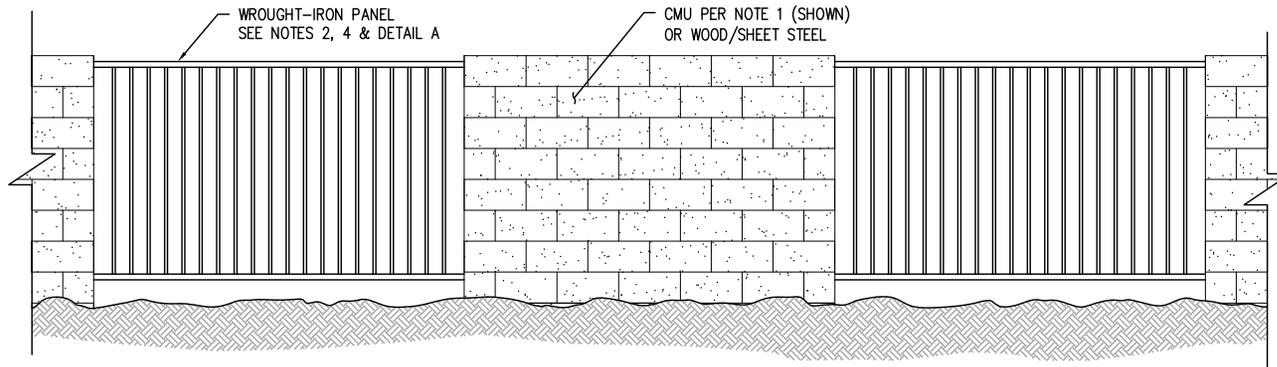


FIGURE 005-1
FENCE/WALL ELEVATION OVER CHANNELS

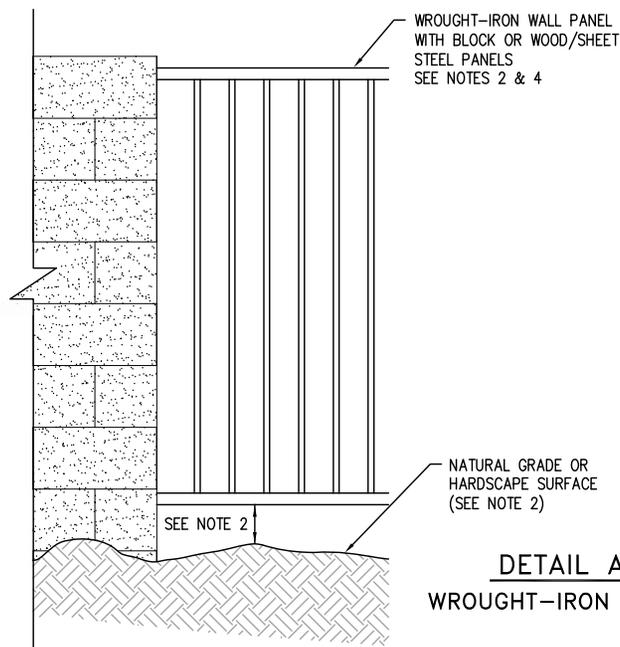
SCALE: N.T.S.

DRAWN BY: sak

DATE: Sept. 2019



SCHEMATIC ELEVATION
 SHOWN: 50% OF WALL/LENGTH CONSISTS OF
 WROUGHT-IRON PANELS (NOTE 5)



DETAIL A
 WROUGHT-IRON PANEL

NOTES:

1. BASED ON STD 8"x8"x16" CMU BLOCK.
2. BOTTOM OF HORIZONTAL MEMBER IS MIN. 6" ABOVE NATURAL GRADE, OR, IF FENCE ENCLOSES A SWIMMING POOL, 4" ABOVE GRADE, WHICH MUST BE A HARDSCAPE SURFACE AT NATURAL GRADE.
3. SOLID PORTIONS OF WROUGHT-IRON PANEL TO OBSTRUCT NO MORE THAN 20% OF 100-YR FLOOD FLOW AREA, ASSUMING A 2 FT. FLOW DEPTH.
4. BLOCK WALL TO BE OFFSET A MIN. OF 25 FT. FROM PROPERTY BOUNDARY.
5. WALL DETAILS ADDRESS HYDRAULIC REQUIREMENTS ONLY. ADDITIONAL ANALYSIS MUST BE PERFORMED BY APPLICANT TO DETERMINE DETAILS FOR STRUCTURAL STABILITY OF WALL.
6. PROPERTY OWNER MUST COVENANT FLOOD OPENINGS AND WROUGHT IRON FENCE SHALL BE KEPT CLEAR OF DEBRIS OR BLOCKAGE AT ALL TIMES.
7. DETAILS PRESENTED DO NOT APPLY TO WALL CROSSING WASHES.

NOT FOR CONSTRUCTION

STANDARD DETAILS FOR WALLS/FENCES IN FLOODPLAINS

Suzanne Shields

5/19/21

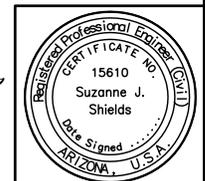
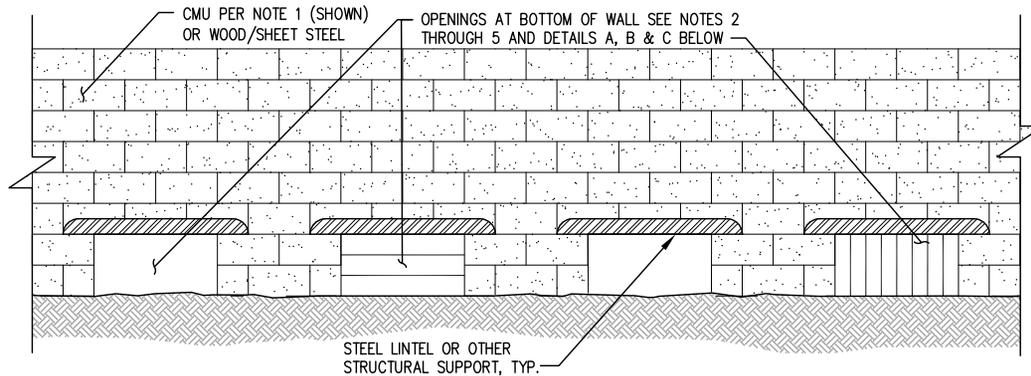


FIGURE 005-2
 FLOOD OPENINGS COMPOSED OF WROUGHT IRON FENCE PANELS

SCALE: N.T.S.

DRAWN BY: sak

DATE: Sept. 2019

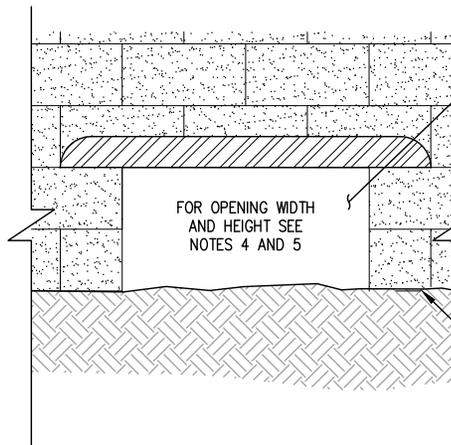


SCHMATIC ELEVATION

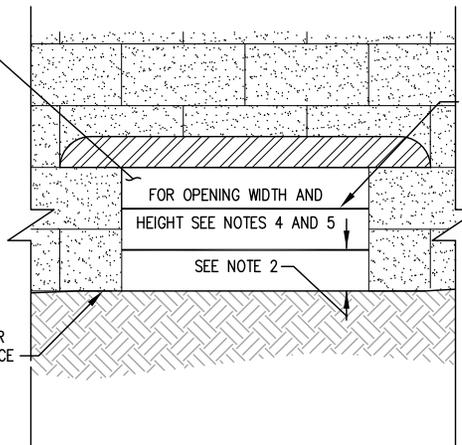
SHOWN: 50% OF WALL/LENGTH CONSISTS OF FLOOD OPENINGS (NOTE 6)

NOTES:

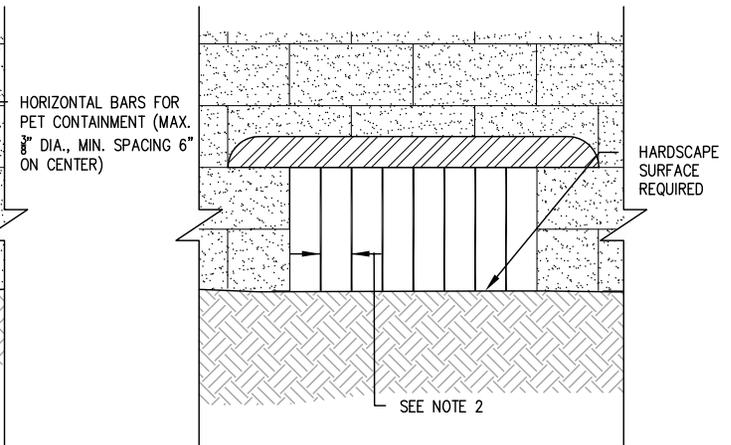
1. BASED ON STD 8"x8"x16" CMU BLOCK
2. IF REBAR IS PLACED IN OPENING, REBAR SHALL BE ORIENTED HORIZONTALLY WITH LOWEST BAR MIN. 6" ABOVE NATURAL GRADE WITH MIN. 6" SPACING ON CENTER. (SEE DETAIL B)
3. IF FENCE ENCLOSES A SWIMMING POOL, REBAR MUST BE ORIENTED VERTICALLY WITH 4" SPACING ON CENTER WITH HARDSCAPE SURFACE AT NATURAL GRADE AT BOTTOM OF OPENING. (SEE DETAIL C)
4. OPENINGS TO BE MIN. 2 BLOCKS (32") WIDE.
5. WHERE BASE FLOOD ELEVATION (BFE) IS >6", OPENING HEIGHT MIN. 2 FULL BLOCKS HIGH OR TO BFE, WHICHEVER IS GREATER. WHERE BFE IS 6" OR LESS, OPENING HEIGHT IS MIN 1 FULL BLOCK HIGH.
6. BLOCK WALL TO BE OFFSET A MIN. OF 25 FT. FROM PROPERTY BOUNDARY.
7. WALL DETAILS ADDRESS HYDRAULIC REQUIREMENTS ONLY. ADDITIONAL ANALYSIS MUST BE PERFORMED BY APPLICANT TO DETERMINE DETAILS FOR STRUCTURAL STABILITY OF WALL.
8. PROPERTY OWNER MUST SIGN COVENANTS REQUIRING MAINTENANCE OF FLOOD OPENINGS AND WROUGHT IRON FENCE TO BE KEPT CLEAR OF DEBRIS OR BLOCKAGE AT ALL TIMES.
9. DETAILS PRESENTED DO NOT APPLY WHERE WALLS CROSS WASH CHANNELS.



DETAIL A
FLOOD OPENING WITHOUT BARS



DETAIL B
FLOOD OPENING WITH HORIZONTAL BARS



DETAIL C
FLOOD OPENING WITH VERTICAL BARS (FOR POOL ENCLOSURES ONLY)

Suzanne Shields

5/19/21



FIGURE 005-3

FLOOD OPENINGS LOCATED IN WALL/FENCES IN FLOODPLAINS

SCALE: N.T.S.

DRAWN BY: sak

DATE: Nov. 2020