



## **Floodwater Grant Program – Example Concepts**

### ***November 2017***

The San Francisco Public Utilities Commission (SFPUC)'s Floodwater Grant Assistance Program helps property owners in San Francisco minimize the risk of property damage due to flooding from rainstorms. We encourage you to take advantage of the Grant Program and prepare your property for storms.

To assist grant applicants in assessing the types of projects they could implement, we have developed the attached list of Example Concepts. This information is not intended to recommend any one project type over another, nor is intended to be a comprehensive list. This document may be used as a starting point and a reference document of projects concepts that have reduced the impacts of flooding.

We highly recommend that applicants work with their engineer and/or contractor to identify the appropriate project type(s) for their property.

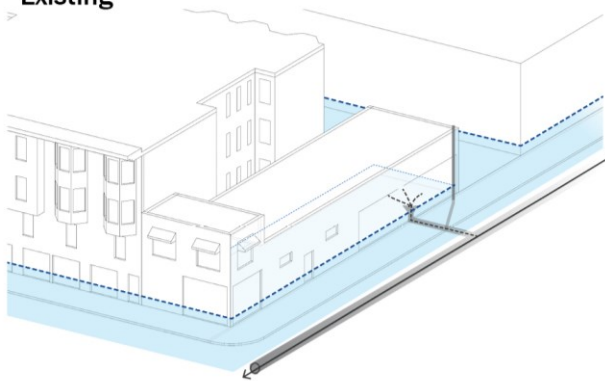
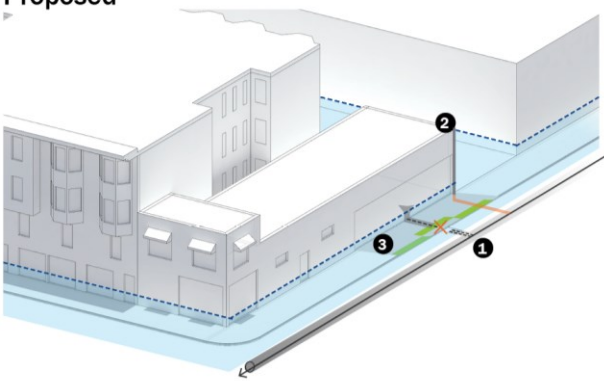
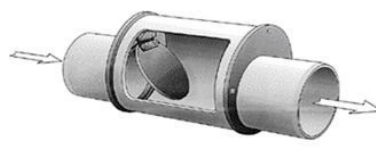

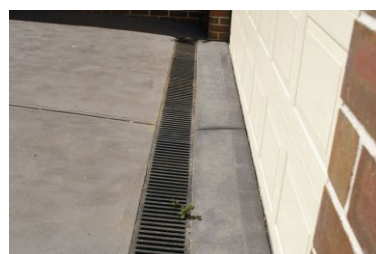
For more information and to download an application, visit:  
[www.sfwater.org/FloodwaterGrants](http://www.sfwater.org/FloodwaterGrants).

Contact our Grant Administrator with any questions:  
[FloodwaterGrants@sfwater.org](mailto:FloodwaterGrants@sfwater.org) or 415-695-7326.

# SFPUC Floodwater Grant Program

## Example *Plumbing* Concepts

October 2017

Graphic/Photo	Concept Details	Advantages and Limitations
<p><b>Existing</b></p>  <p><b>Proposed</b></p>  <p>1 Backwater valve    2 Disconnect roof leaders    3 Adjacent sidewalk improvements</p>		
<b>Backwater Valves: A device in the plumbing system used to maintain flow in one direction in a sewer pipeline</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Horizontal Backwater Valves</li> <li>• <i>Purpose:</i> Prevents backflow through plumbing fixtures</li> <li>• <i>Availability:</i> Hardware Stores, Online</li> <li>• <i>Contractor:</i> C36 License Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> Requires digging up floor, installing access hatch, regular maintenance; can get clogged; applicability subject to specific plumbing arrangements and may require additional plumbing work</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Vertical Backwater Valves</li> <li>• <i>Purpose:</i> Prevents backflow through floor drains and vertical drains</li> <li>• <i>Availability:</i> Hardware Stores</li> <li>• <i>Contractor:</i> Property Owner, Handyman, or General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; inexpensive; can be easy to install; available at hardware stores</li> <li>• <i>Limitations:</i> Requires regular maintenance; can get clogged</li> </ul>
<b>Stormwater Diversion: An improvement that separates roof drainage from the sewer lateral or captures rainfall</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Improve Site Drainage</li> <li>• <i>Purpose:</i> Ensure proper drainage from low points</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> Property Owner, Handyman, General Contractor, or C36 Licensed Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; can work in conjunction with other floodproofing technologies/concepts</li> <li>• <i>Limitations:</i> May require extensive site regrading and plumbing modifications</li> </ul>

# SFPUC Floodwater Grant Program

## Example *Plumbing* Concepts




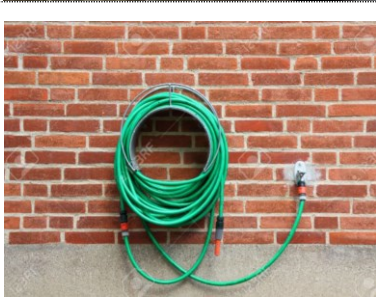
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Graphic/Photo	Concept Details	Advantages and Limitations
	<ul style="list-style-type: none"> <li>• <i>Item/Process</i>: Modify Roof Leader</li> <li>• <i>Purpose</i>: Reroute roof leaders away from sewer lateral</li> <li>• <i>Availability</i>: Contact C36 Licensed Contractor</li> <li>• <i>Contractor</i>: Property Owner, Handyman, General Contractor, or C36 Licensed Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages</i>: Continuous protection; can work in conjunction with backwater valves</li> <li>• <i>Limitations</i>: May require extensive replumbing</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process</i>: Rain Barrels</li> <li>• <i>Purpose</i>: Capture property's rainfall</li> <li>• <i>Availability</i>: Hardware Stores</li> <li>• <i>Contractor</i>: Property Owner, Handyman, or General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages</i>: Potentially easy to install; water captured can be used for irrigation</li> <li>• <i>Limitations</i>: Space; aesthetics; only applicable for downspouts draining large roof areas</li> </ul>
<b>Pumping: An improvement that allows for water to be moved away from the property</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process</i>: Sump Pump Kit</li> <li>• <i>Purpose</i>: Pumps out relatively small amounts of water coming in through a pedestrian door, garage door, or plumbing fixtures; drains a space after flooding occurs</li> <li>• <i>Availability</i>: Hardware Stores</li> <li>• <i>Contractor</i>: C36 Licensed Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages</i>: Can work in conjunction with other projects to relieve minor remaining floodwater; provides minor interior dewatering</li> <li>• <i>Limitations</i>: Requires digging up an area of the floor and regular maintenance, must have power or battery; not sufficient for major flooding</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process</i>: Toilet with Grinder Pump</li> <li>• <i>Purpose</i>: Prevents backflows by pumping flushed water (via special pumps) uphill</li> <li>• <i>Availability</i>: Hardware Stores</li> <li>• <i>Contractor</i>: Property Owner, Handyman, or General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages</i>: Potentially easy to install; can work in conjunction with other floodproofing technologies/concepts</li> <li>• <i>Limitations</i>: Must have power or battery; not sufficient for major flooding</li> </ul>

# SFPUC Floodwater Grant Program

## Example *Dry Floodproofing* Concepts

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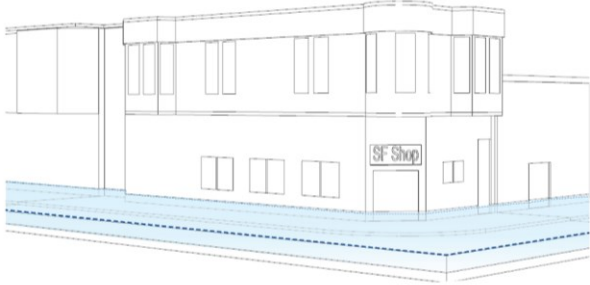
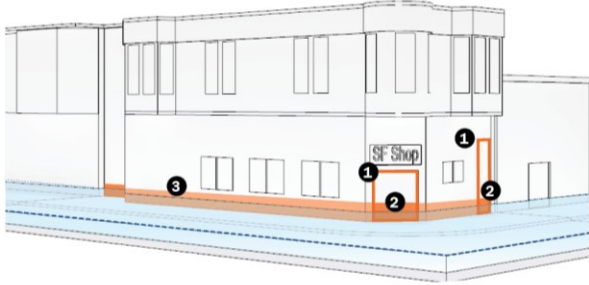
Graphic/Photo	Concept Details	Advantages and Limitations
Permanent Water Resistant Doorways/Seals: Modifications/Sealing to prevent floodwaters from entering building		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Garage Door Side Seal</li> <li>• <i>Purpose:</i> Reduces shallow overland flow through side gaps of garage door</li> <li>• <i>Availability:</i> Hardware Stores</li> <li>• <i>Contractor:</i> Property Owner, Handyman, or General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; inexpensive; easy to install</li> <li>• <i>Limitations:</i> May not provide a complete seal; applicability depends on configuration of garage door</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Garage Door Floor Seal</li> <li>• <i>Purpose:</i> Reduces shallow overland flow through bottom gap of garage door</li> <li>• <i>Availability:</i> Hardware Stores</li> <li>• <i>Contractor:</i> Property Owner, Handyman, or General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; inexpensive; easy to install</li> <li>• <i>Limitations:</i> May not provide a complete seal</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Water-Tight Doors and/or windows</li> <li>• <i>Purpose:</i> Reduces flow through doorways and/or windows</li> <li>• <i>Availability:</i> Online</li> <li>• <i>Contractor:</i> General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> May not provide a complete seal</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Seal Openings</li> <li>• <i>Purpose:</i> Seal or move openings for hoses, gas lines, dryer vents, etc.</li> <li>• <i>Availability:</i> Contact General Contractor/Mechanical Contractor/Electrical Contractor</li> <li>• <i>Contractor:</i> General Contractor/Mechanical Contractor/Electrical Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> Applicability subject to specific electrical/mechanical arrangements; may require additional electrical/mechanical modifications</li> </ul>






# SFPUC Floodwater Grant Program

## Example *Dry Floodproofing* Concepts

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Graphic/Photo	Concept Details	Advantages and Limitations
<p><b>Existing</b></p> 	<p><b>Proposed</b></p>  <p> <b>1</b> Water stop and seals in door frames    <b>2</b> Flood panels to fit into doorways    <b>3</b> Waterproof exterior finish </p>	

### Temporary Flood Barriers: Deployable barriers to prevent flood waters from entering building

	<ul style="list-style-type: none"> <li>• <i>Item/Process</i>: Water-Absorbing Sacks</li> <li>• <i>Purpose</i>: Reduces impacts due to shallow overland flow</li> <li>• <i>Availability</i>: Online</li> <li>• <i>Contractor</i>: N/A (Owner deployed)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages</i>: Light; reconfigurable; can be placed on sidewalks, driveways, etc.</li> <li>• <i>Limitations</i>: Property owner must store and deploy prior to storm; low height; limited protection</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process</i>: Inflatable Flood Barrier</li> <li>• <i>Purpose</i>: Reduces impacts due to shallow overland flow</li> <li>• <i>Availability</i>: Online</li> <li>• <i>Contractor</i>: N/A (Owner deployed)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages</i>: Light; reconfigurable; reusable; can be placed on sidewalks, driveways, etc.</li> <li>• <i>Limitations</i>: Property owner must deploy and fill prior to storm; low height; limited protection</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process</i>: Emergency Flood Barriers</li> <li>• <i>Purpose</i>: Reduces overland flow onto a property/parcel from the sidewalk or right-of-way</li> <li>• <i>Availability</i>: Online</li> <li>• <i>Contractor</i>: N/A (Owner deployed)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages</i>: Light; reconfigurable; reusable; can be placed on sidewalks, driveways, etc.; can be linked into a long continuous barrier</li> <li>• <i>Limitations</i>: Property owner must store and deploy prior to storm</li> </ul>

# SFPUC Floodwater Grant Program

## Example *Dry Floodproofing* Concepts

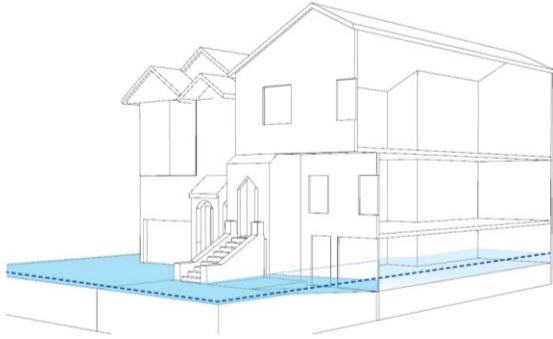
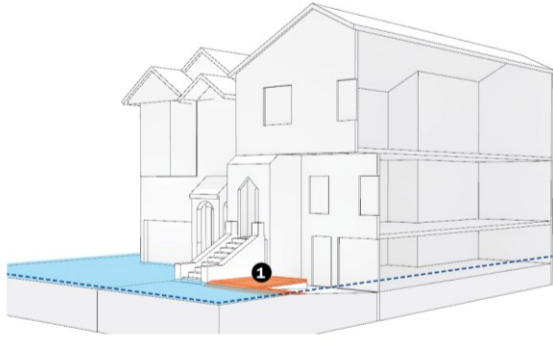
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Graphic/Photo	Concept Details	Advantages and Limitations
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Stackable Flood Barrier</li> <li>• <i>Purpose:</i> Reduces damage due to deeper overland flow through doorways including down-sloping driveways</li> <li>• <i>Availability:</i> Online</li> <li>• <i>Contractor:</i> Purchase panels through vendor; Install frame through General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Easy to deploy; can seal large openings like garage doors.</li> <li>• <i>Limitations:</i> Property owner must store and deploy prior to storm; requires modification and narrowing of doorway opening</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Temporary Window Barrier</li> <li>• <i>Purpose:</i> Reduces overland flow through windows</li> <li>• <i>Availability:</i> Online</li> <li>• <i>Contractor:</i> Purchase panels through vendor; Install frame through General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Light; reusable; may not require window modification</li> <li>• <i>Limitations:</i> Property owner must store and deploy prior to storm</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Temporary Doorway Barrier</li> <li>• <i>Purpose:</i> Reduces overland flow through doorways</li> <li>• <i>Availability:</i> Online</li> <li>• <i>Contractor:</i> Purchase panels through vendor; Install frame through General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Light; reusable; may not require doorway modification</li> <li>• <i>Limitations:</i> Property owner must store and deploy prior to storm</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Deployable Entry Gate</li> <li>• <i>Purpose:</i> Reduces damage due to deeper overland flow through doorways</li> <li>• <i>Availability:</i> Online</li> <li>• <i>Contractor:</i> Purchase through Vendor; Install through General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Easy to deploy; can seal large openings like garage doors.</li> <li>• <i>Limitations:</i> May be difficult and/or costly to install; must seat against walls on both sides; requires storage and manual deployment</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Self-Deploying Buoyant Flood Barrier</li> <li>• <i>Purpose:</i> Reduces damage due to deeper overland flow through doorways including down-sloping driveways</li> <li>• <i>Availability:</i> Online</li> <li>• <i>Contractor:</i> Purchase through Vendor; Install through General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection (always in place, floats up when flooding takes place or can be manually raised)</li> <li>• <i>Limitations:</i> May be difficult and/or costly to install; must seat against walls on both sides</li> </ul>




# SFPUC Floodwater Grant Program

## Example *Dry Floodproofing* Concepts

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Graphic/Photo	Concept Details	Advantages and Limitations
<p><b>Existing</b></p> 	<p><b>Proposed</b></p>  <p>1 Raised embankment</p>	

### Permanent Flood Barriers: Permanent structures designed/constructed to prevent flood waters from entering building

	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Driveway Entry Bump</li> <li>• <i>Purpose:</i> Reduces flooding due to overland flow onto a property/parcel from sidewalk or public right of way</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> Contact Engineer/Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; configurable; can be used with other floodproofing technologies/processes</li> <li>• <i>Limitations:</i> Only addresses minor overland flow-related flooding</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Flood Curb</li> <li>• <i>Purpose:</i> Reduces damage due to overland flow; protects yard or sides of driveway</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> Contact Engineer/Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; configurable</li> <li>• <i>Limitations:</i> Grant only covers walls facing public right of way (i.e. not facing an adjacent property)</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Flood Wall</li> <li>• <i>Purpose:</i> Reduces damage due to overland flow onto a property/parcel from sidewalk or public right of way</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> Contact Engineer/Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> Grant only covers walls facing public right of way (i.e. not facing an adjacent property)</li> </ul>



# SFPUC Floodwater Grant Program

## Example *Dry Floodproofing* Concepts

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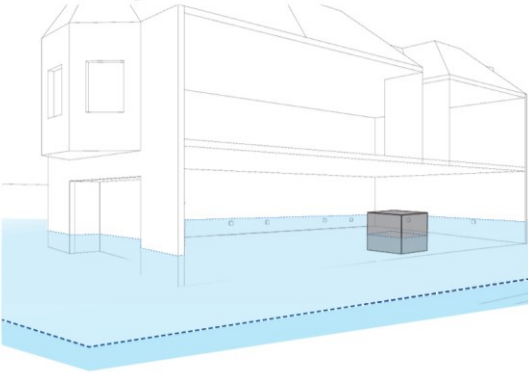
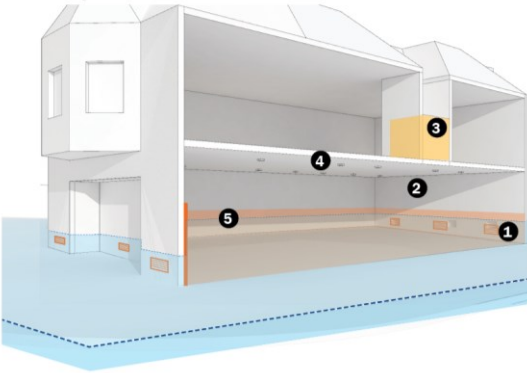



Graphic/Photo	Concept Details	Advantages and Limitations
<p><b>Existing</b></p> 	<p><b>Proposed</b></p>  <p> <b>1</b> Fill in the driveway, eliminate access doors  <b>2</b> Windows above flood elevation  <b>3</b> Re-purpose space for non-residential  <b>4</b> Reconfigure access         </p>	
<b>Regrade Entry: Modify driveway/entry to eliminate a depressed entrance into garage/entrance</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Regrade/Raise driveway</li> <li>• <i>Purpose:</i> Reduces water flow into garage via depressed driveway</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> Limited height; may reduce headspace; construction may be difficult and/or costly</li> </ul>
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Raised Sidewalk/Berm/Threshold</li> <li>• <i>Purpose:</i> Reduces shallow overland flow through a pedestrian door</li> <li>• <i>Availability:</i> Contact Contractor</li> <li>• <i>Contractor:</i> General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> Limited height; commercial Americans with Disabilities Act (ADA) restrictions</li> </ul>
<b>Elevate Openings Above Flood Levels: Modify building openings to be located above flood levels</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Raise Building Openings</li> <li>• <i>Purpose:</i> Reduces water flow into building</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; maintains usefulness of some openings</li> <li>• <i>Limitations:</i> Construction may be difficult and/or costly</li> </ul>
<b>Internal Stairway: Create access to lower level of building</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Modify entry into lower level of building</li> <li>• <i>Purpose:</i> Provides access to lower levels of building that may have been modified with other floodproofing</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; provides access to modified areas of building</li> <li>• <i>Limitations:</i> Construction may be difficult and/or costly</li> </ul>



# SFPUC Floodwater Grant Program

## Example *Wet Floodproofing* Concepts



October 2017

Graphic/Photo	Concept Details	Advantages and Limitations
<p><b>Existing</b></p> 	<p><b>Proposed</b></p>  <p> <b>1</b> Flood vents to let water in and out  <b>2</b> Flood-resistant windows  <b>3</b> Elevated utility box  <b>4</b> Ceiling sockets  <b>5</b> Cleanable/ sprayable surfaces         </p>	
<b>Elevate Utilities: Protects critical utilities and appliances</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Elevate Utilities Above Flood Level</li> <li>• <i>Purpose:</i> Protect Utilities and Appliances from Flood Damage</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> General Contractor/Mechanical Contractor/Electrical Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; inexpensive means to protect critical equipment</li> <li>• <i>Limitations:</i> Applicability subject to specific electrical arrangements; may require additional electrical work</li> </ul>
<b>Ceiling Attached Sockets: Protects electrical outlets from flood damage</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Ceiling-Attached Sockets</li> <li>• <i>Purpose:</i> Prevents damage to electrical outlets</li> <li>• <i>Availability:</i> Contact Electrical Contractor/Hardware Store</li> <li>• <i>Contractor:</i> Electrical Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> Applicability subject to specific electrical arrangements; may require additional electrical work</li> </ul>
<b>Cleanable Surfaces: Make flood-prone surfaces cleanable</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Use of paints (e.g. polyester-epoxy, etc.) in floodable spaces that are easily cleaned</li> <li>• <i>Purpose:</i> Protect interior surfaces and makes surfaces washable</li> <li>• <i>Availability:</i> Hardware stores</li> <li>• <i>Contractor:</i> Property Owner, Handyman, or General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection; available at hardware stores</li> <li>• <i>Limitations:</i> Requires maintenance/cleaning after flood events; may not be applicable on all surfaces</li> </ul>

# SFPUC Floodwater Grant Program

## Example *Wet Floodproofing* Concepts

October 2017

Graphic/Photo	Concept Details	Advantages and Limitations
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Waterproofed External Walls</li> <li>• <i>Purpose:</i> Protect exterior wall and finishes from flood water</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> Contact Engineer/Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> Requires maintenance/cleaning after flood events; construction may be difficult and/or costly</li> </ul>
<b>Create Floodable Space: Provide access for floodwater to enter designed, floodable spaces</b>		
	<ul style="list-style-type: none"> <li>• <i>Item/Process:</i> Flood Vents</li> <li>• <i>Purpose:</i> Designed to allow floodwater to pass through building</li> <li>• <i>Availability:</i> Contact Engineer/Contractor</li> <li>• <i>Contractor:</i> General Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Advantages:</i> Continuous protection</li> <li>• <i>Limitations:</i> Likely requires additional modifications (e.g. re-grading floor, painting interior/exterior walls); requires maintenance after rain event; can get clogged</li> </ul>