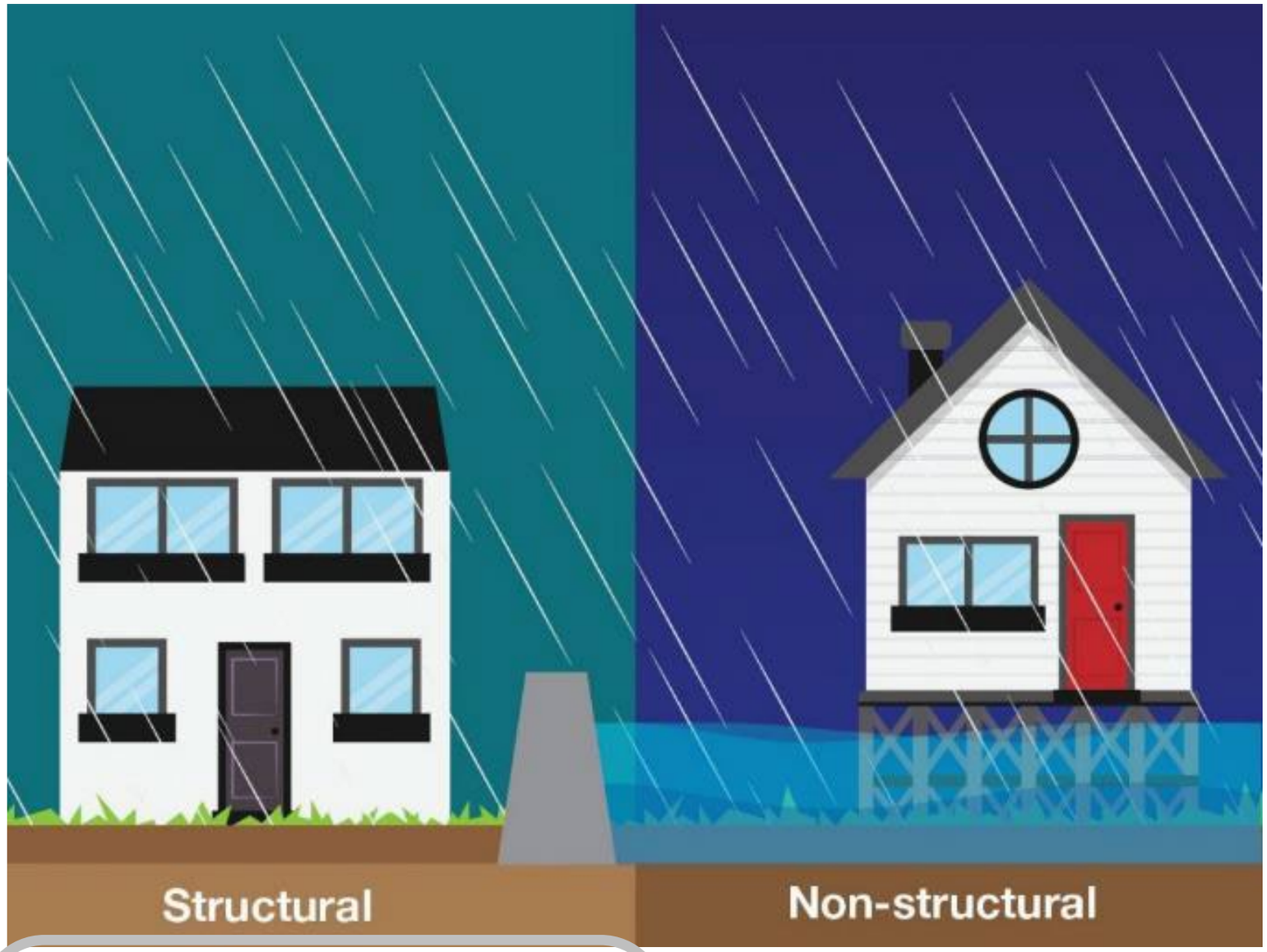
Example Measures



Structural

- Detention – Dams and Basins
- Conveyance – Conduits, Channels, Floodwalls and Levees

Nonstructural

- Elevation
- Floodproofing
- Relocation

Existing Condition

Example Measures

Structural

Street Conveyance

Source: Green Infrastructure for Southwestern Neighborhoods, V1.2, Revised 2012

Example Measures

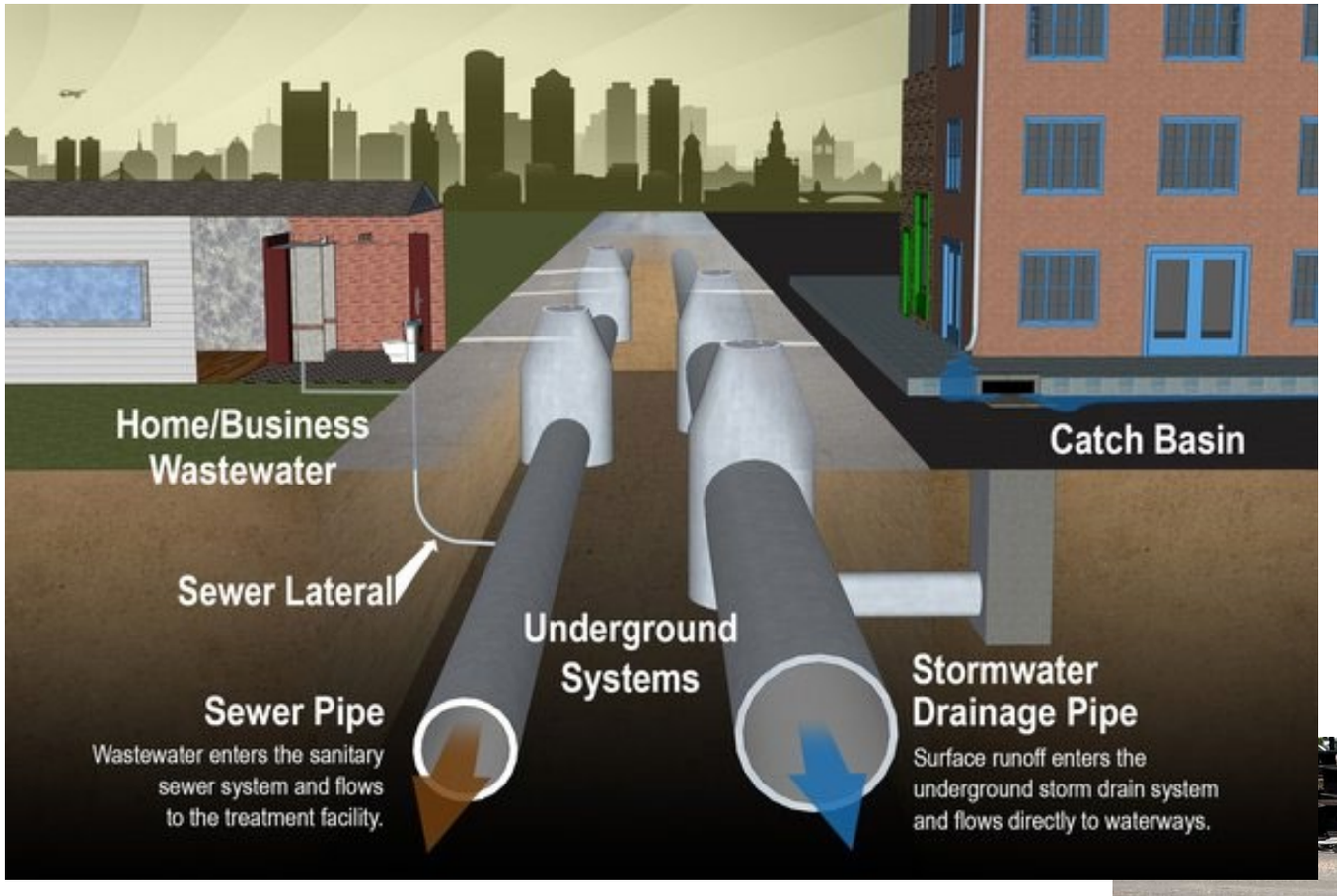
Structural

Concrete Channels

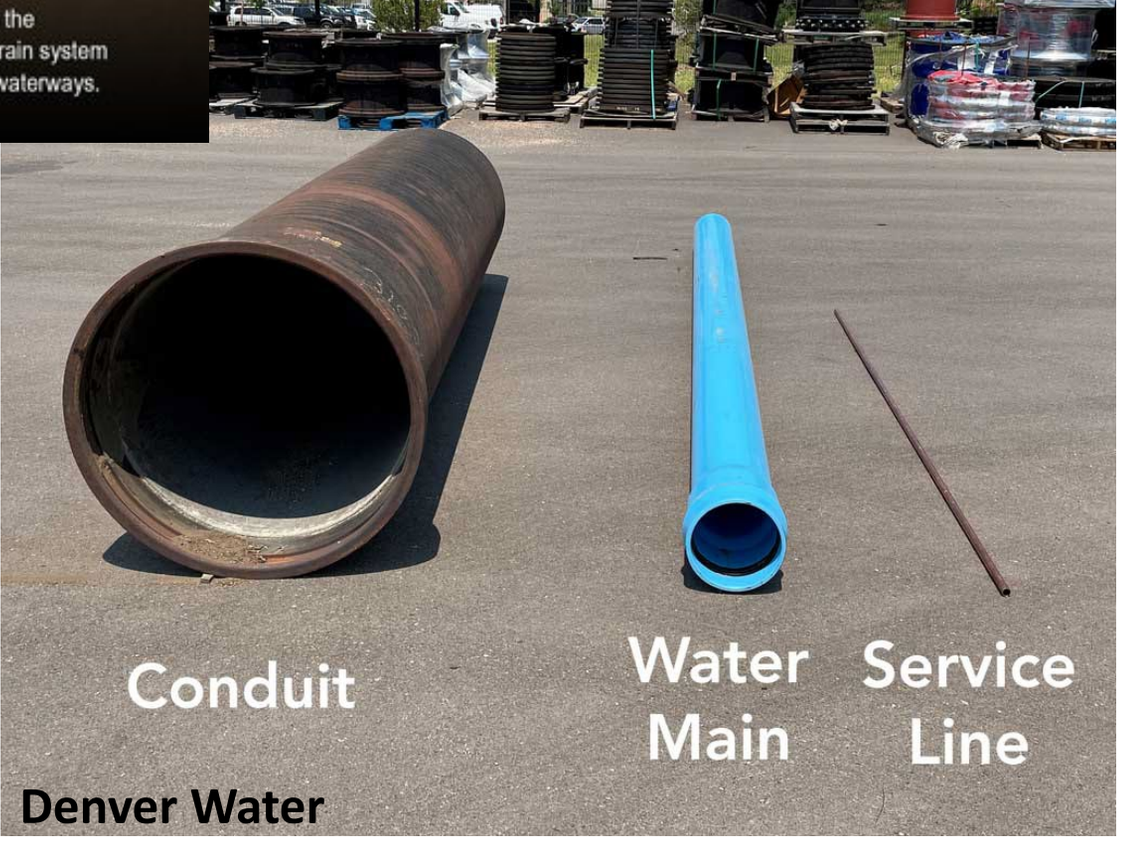
Source: Green Infrastructure for Southwestern Neighborhoods, V1.2, Revised 2012

Example Measures

Structural

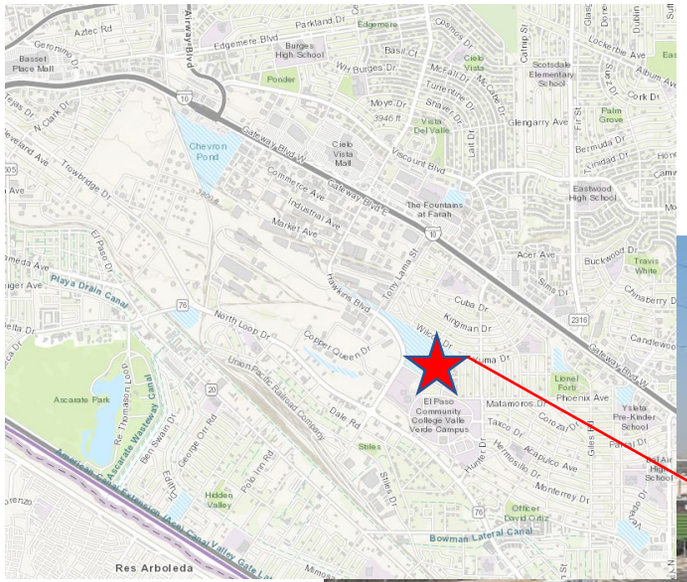


Stormwater Conduits



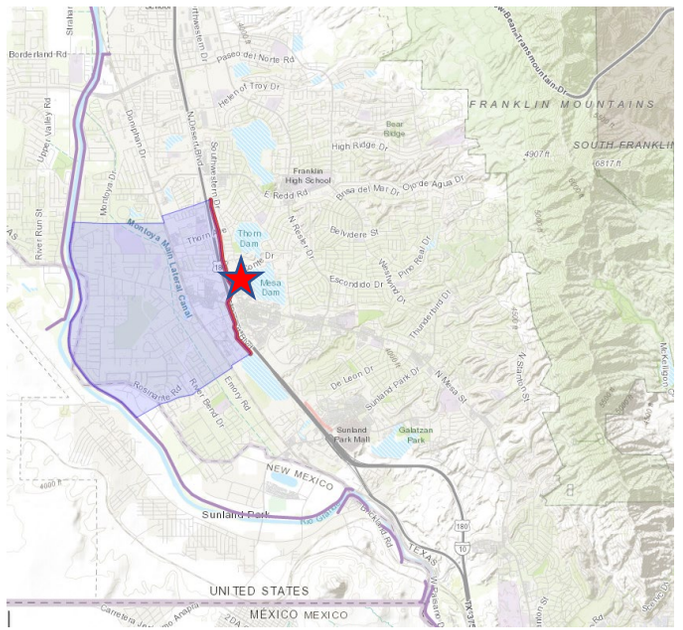
USACE Examples

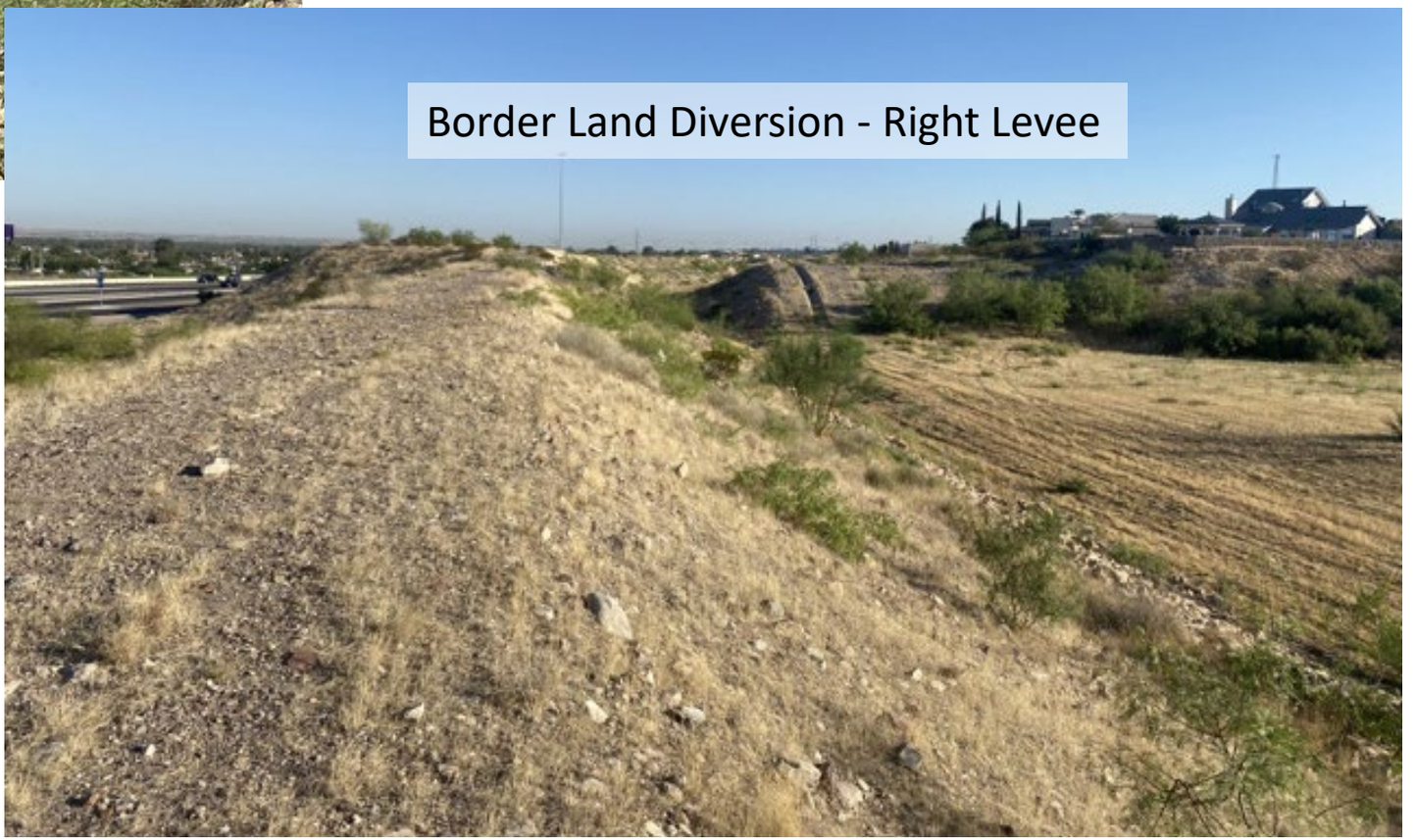
Structural



USACE Examples

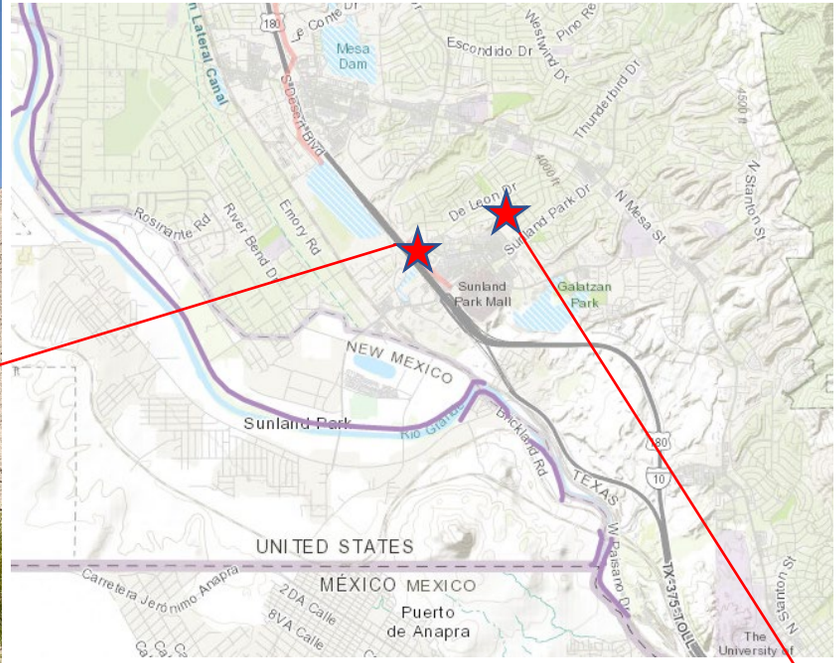
Structural





USACE Examples

Structural



Example Measures

Before

Green infrastructure: Implementation of GI on this corner in a Tucson neighborhood captures runoff that previously flooded the street while creating a community asset.

After

Green Infrastructure

Curb Cut with Rain Garden

Source: Green Infrastructure for Southwestern Neighborhoods, V1.2, Revised 2012

Example Measures

Green Infrastructure

This long, shallow swale in the right of way has multiple curb cuts along its length.

At this site in Tucson, a 3" deep swale was created in the ROW to collect runoff from the sidewalk and adjacent property.

This series of basins collects stormwater from the adjacent sidewalk and businesses (without curb cut).

Different swales and basins

Source: Green Infrastructure for Southwestern Neighborhoods, V1.2, Revised 2012

Example Measures

Green Infrastructure

Median with curb cut

Curb cuts on a street in Flagstaff, AZ (left) and curb cores on a street in Tucson (right) are used to direct stormwater runoff from the street into basins **before** pollutants reach washes and rivers.

Cut Curb and Curb Cores

Source: Green Infrastructure for Southwestern Neighborhoods, V1.2, Revised 2012

Example Measures

Bioretention basins, like this one between a restaurant parking lot and the street, capture and filter stormwater. Landscape area is graded **below** the level of the parking lot.

Sedimentation and absorption occur when stormwater is slowed down and is allowed to pool in basins.

A curb cut draws stormwater from the street into a bioretention basin in the right-of-way.

Green Infrastructure

Bioretention Basin

Traffic circle with curb flush with street level

Source: Green Infrastructure for Southwestern Neighborhoods, V1.2, Revised 2012

Green Infrastructure

Example Measures

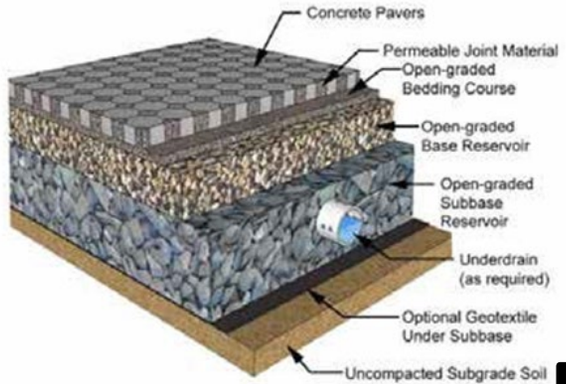
Chicane with curb cut

In this just-installed chicane, 4”-8” rip-rap is used in the channel where stormwater will flow rapidly, and 1” gravel covers upslope areas.

Chicane

Source: Green Infrastructure for Southwestern Neighborhoods, V1.2, Revised 2012

Example Measures



Pervious Surfaces

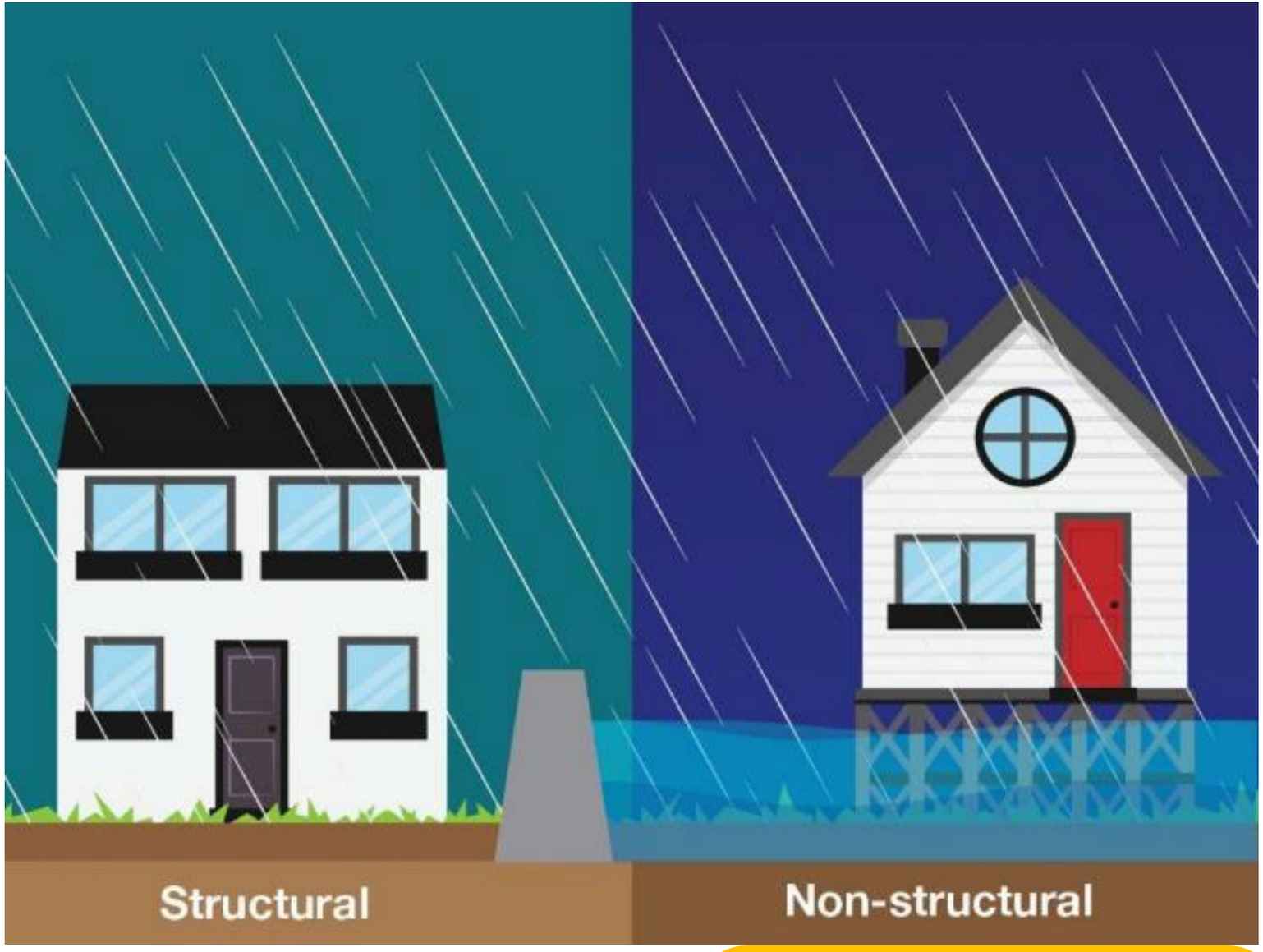
Green Infrastructure

Figure 7: Pervious Pavers (Interlocking Porous Concrete Pavers)
Source: City of Phoenix, Office of Environmental Programs.

Permeable pavers reduce impervious surface areas and aid in heat island mitigation.
Photo: Watershed Management Group

Figure 9: Example Porous Concrete Installation
Source: City of Phoenix, Office of Environmental Programs

Example Measures



Structural

- Detention – Dams and Basins
- Conveyance – Conduits, Channels, Floodwalls and Levees

Nonstructural

- Elevation
- Floodproofing
- Relocation

Nonstructural

- Elevation

Example Measures

Nonstructural

- Elevation

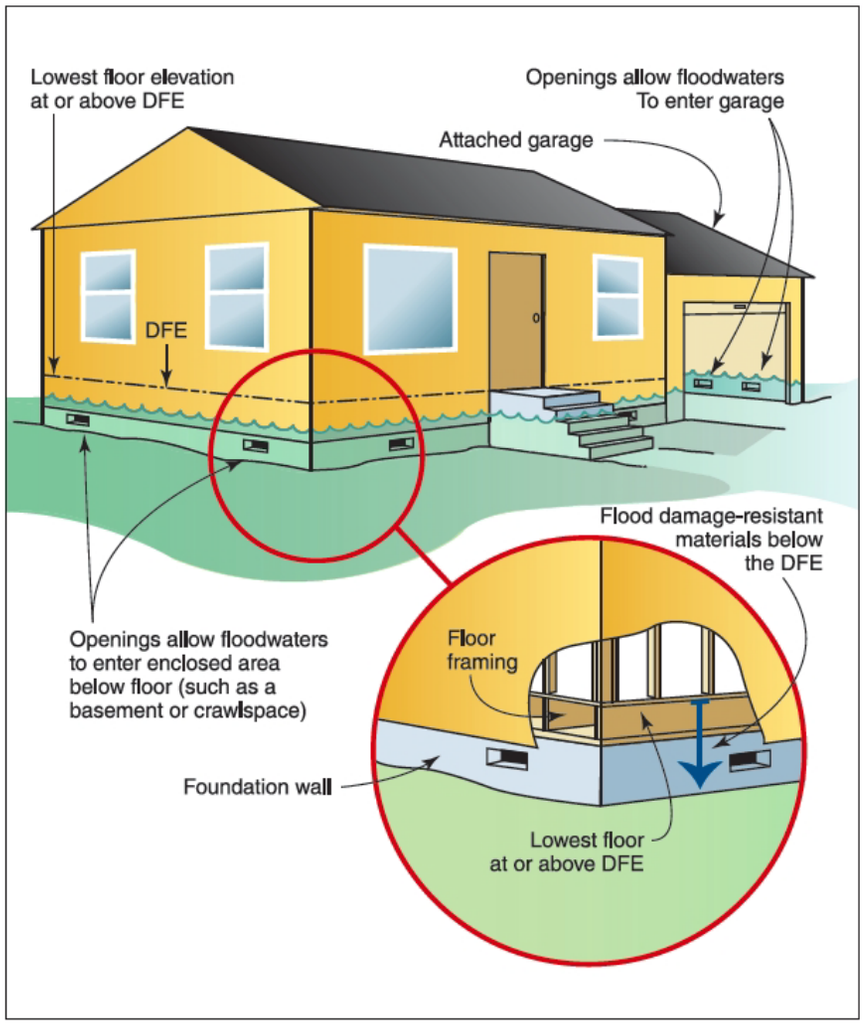
ELEVATING UNREINFORCED FOUNDATION

Elevate superstructure only

Nonstructural

- Wet Floodproofing

Example Measures



Elevating service equipment prevents flood damage.

Flood vents allow water to enter the basement, preventing excessive pressure from developing on the basement walls. (floodflaps.com/new-construction/)

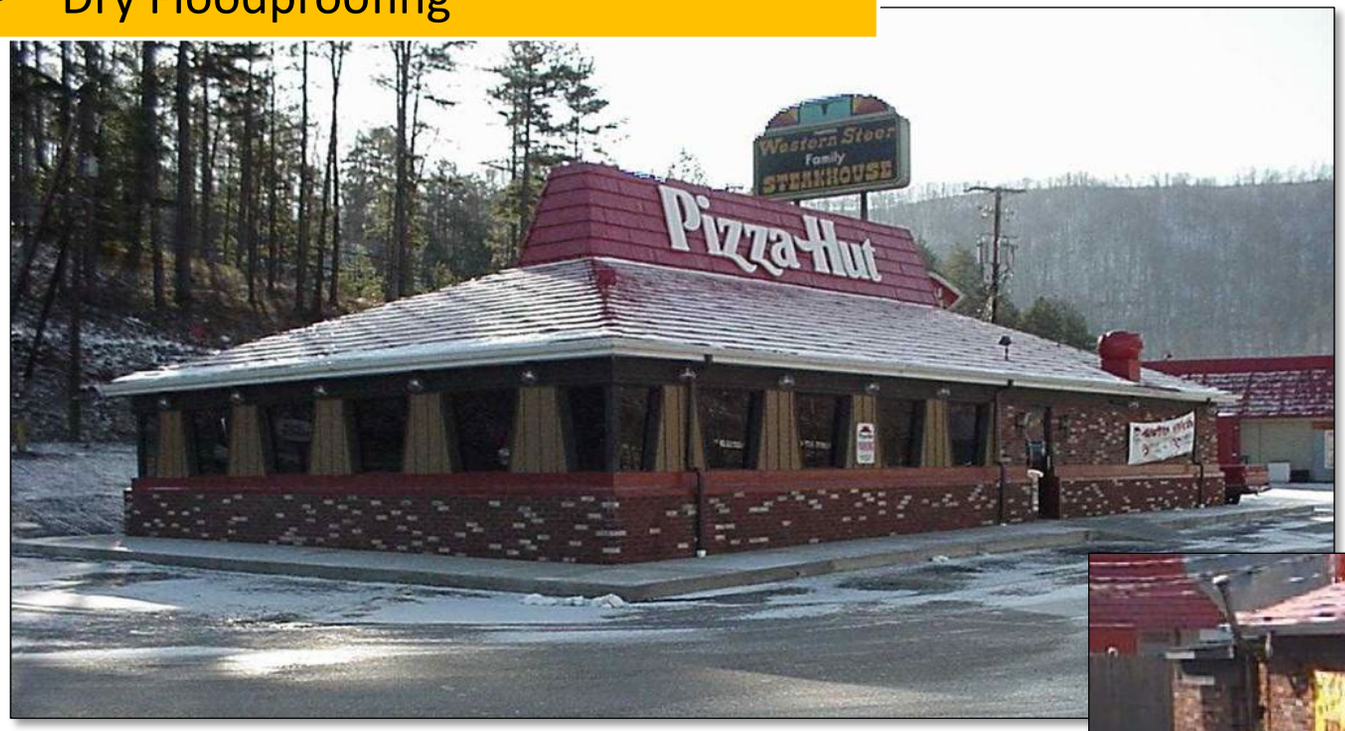
Successful wet floodproofing involves the following:

- Ensuring that flood waters can safely enter and exit the lower level of the house
- Ensuring that flood waters inside and outside the house rise and fall at the same rate
- Protecting the areas of the house that are below the flood level from damage caused by contact with flood waters
- Protecting or relocating utilities, service equipment and any materials stored below the Flood Protection Elevation

Nonstructural

- Dry Floodproofing

Example Measures



- Water resistant sealant applied to walls
- Entrances retrofitted with flood proof barriers

Dry Floodproofing - Passive

Nonstructural

- Dry Floodproofing

Example Measures

Dry Floodproofing - Active

Nonstructural

- Dry Floodproofing

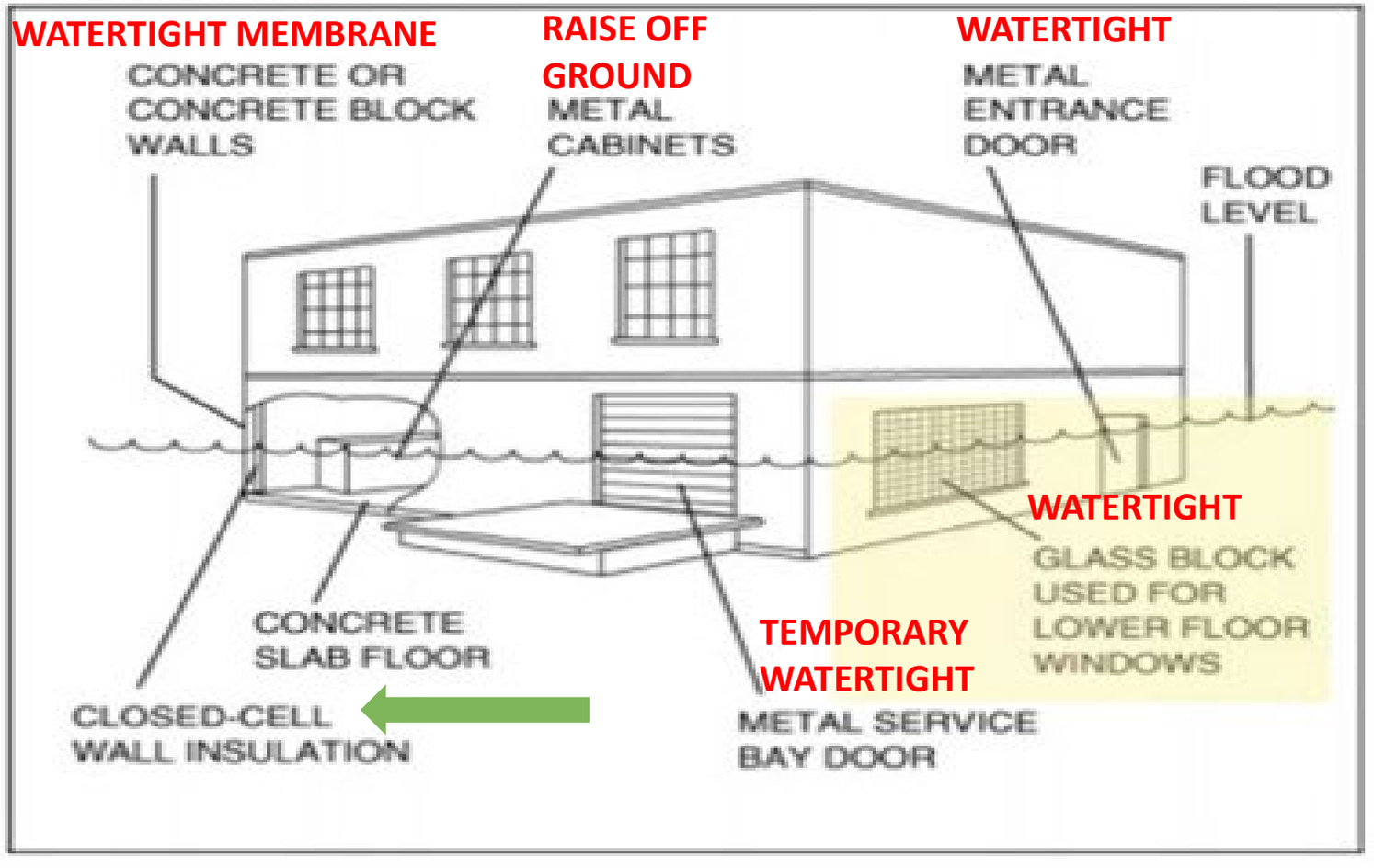


Image from FEMA's Bulletin: Building with Flood-Resistant Materials

These are all Dry Floodproofing

NONRESIDENTIAL MASONRY BUILDING

Nonstructural

- Relocation