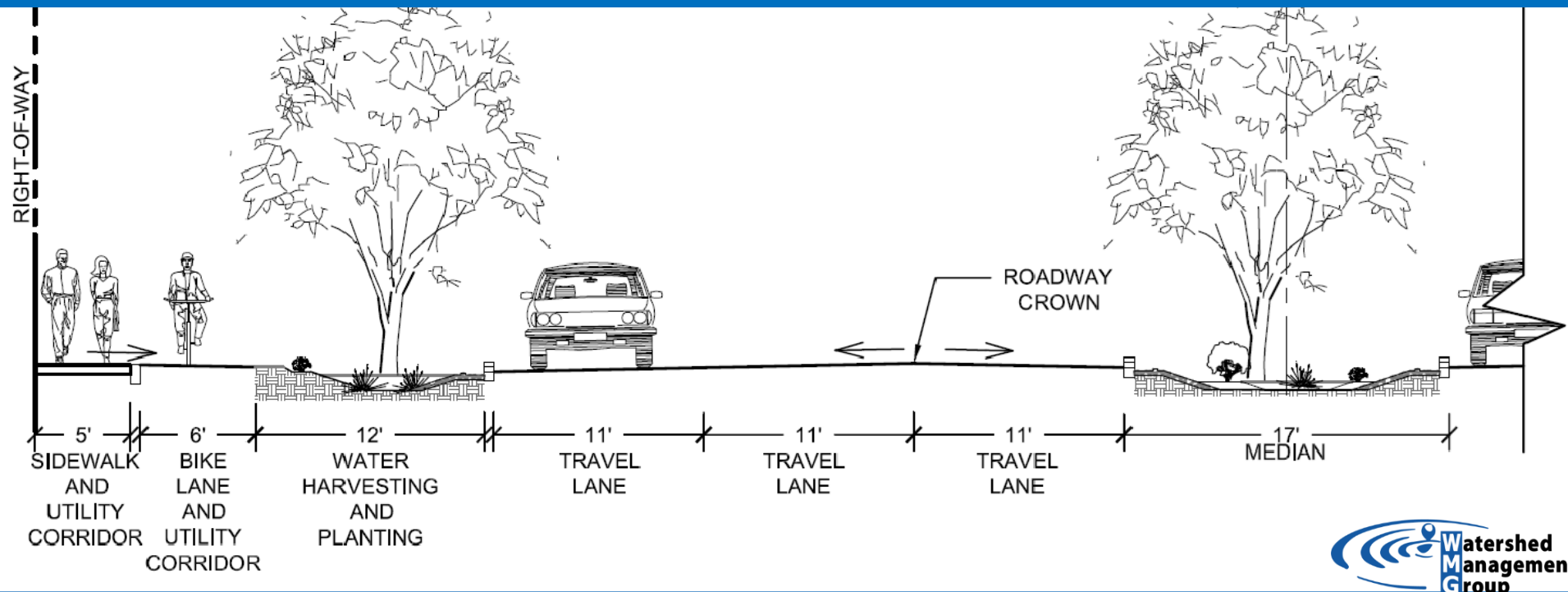




Watershed Management Group develops and implements community-based solutions to ensure the long-term **prosperity of people** and **health of the environment**. We provide people with the knowledge, skills, and resources for sustainable livelihoods.





Sizing and Installing Rainwater Storage Tanks

Use rain tanks to support your vegetable garden



Learning Objectives

1. Recognize types of tanks and benefits.
2. Installing a low maintenance systems
3. Pairing your storage potential with your landscape needs



The capture and use of rainwater, stormwater (and greywater) for beneficial purposes

WATER HARVESTING

Rain Tanks through History

EL JADIDA, MOROCCO

ISTANBUL, TURKEY, INDIA

11TH – 16TH CENTURY

THOMAS JEFFERSON



Passive vs. Active Water Harvesting

Passive: land contouring (basins, swales, berms). Requires little maintenance but cannot store water long-term.

Active: greywater, rain tanks. Requires active use of system but gives more control.

- Tanks allow collection across many rain events and storage during dry months.



5 Steps to Saving Outdoor Water

1. Check monthly your irrigation system and settings!
2. Plant the water (basins) & plant low-water natives
3. Use organic mulch
4. Plan to not irrigate your native landscape after 3 years
5. Scale your veggies or fruit water use to your rain and greywater supply



Active Storage of Rainwater

Reduce groundwater reliance

Preferred water choice of plants – no chlorine, salt

Relatively clean and soft water source

Promote healthy soils

Long-term investment

Energy savings/cost savings



Types of Rain Tanks

Rain Barrels vs. Rain Tanks

- AVERAGE 50-GALLON CAPACITY
- ONLY CAPTURE A PORTION OF RAINFALL EVENTS
- CAN MEET SOME PLANT WATER NEEDS
- GENERALLY LOWER COST
- “TRAINING WHEELS”
- CAPACITY 300 – 1,000 GALLONS OR MORE
- CAN HOLD AN ENTIRE SEASON’S RAIN
- CAN COVER A MAJORITY OF PLANT NEEDS
- PART OF A COMPREHENSIVE WATER HARVESTING SYSTEM



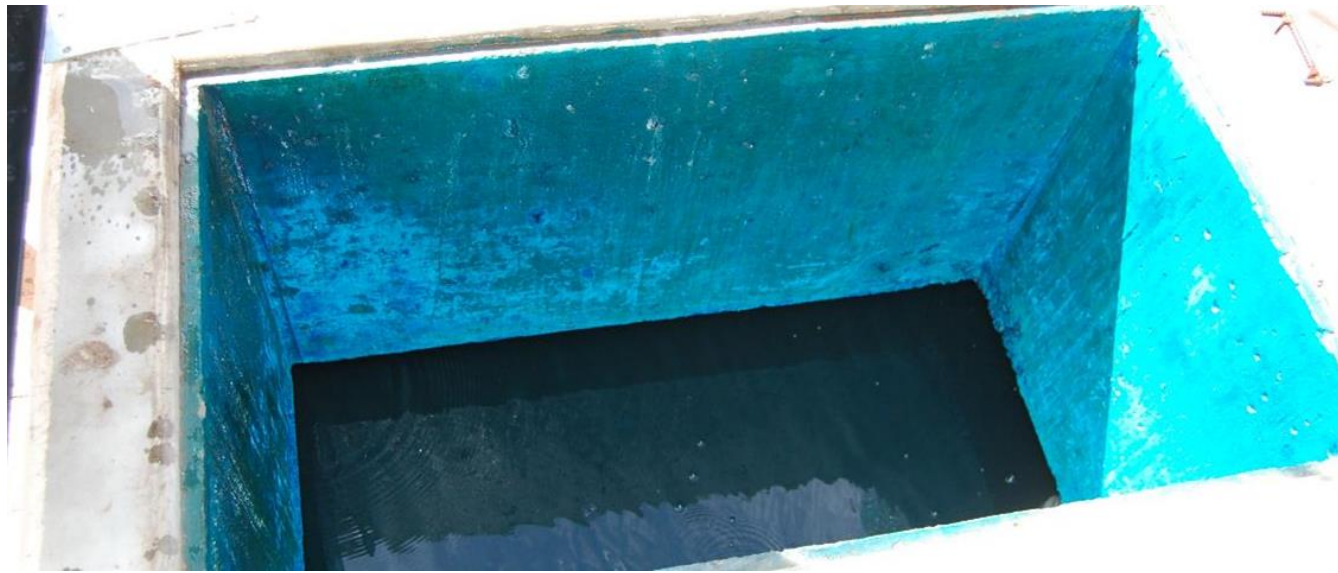








To aspire to...



Stacking Functions of Tanks





Rain tanks as works of art



Designing Your Active System



Raindrop Retreat
Water from the sky is our supply
La Casa del Chorrillo - La lluvia es nuestra cosecha

ROOF/COLLECTION AREA

GUTTERS

FILTRATION

INFLOW

TANK/STORAGE

PAINT

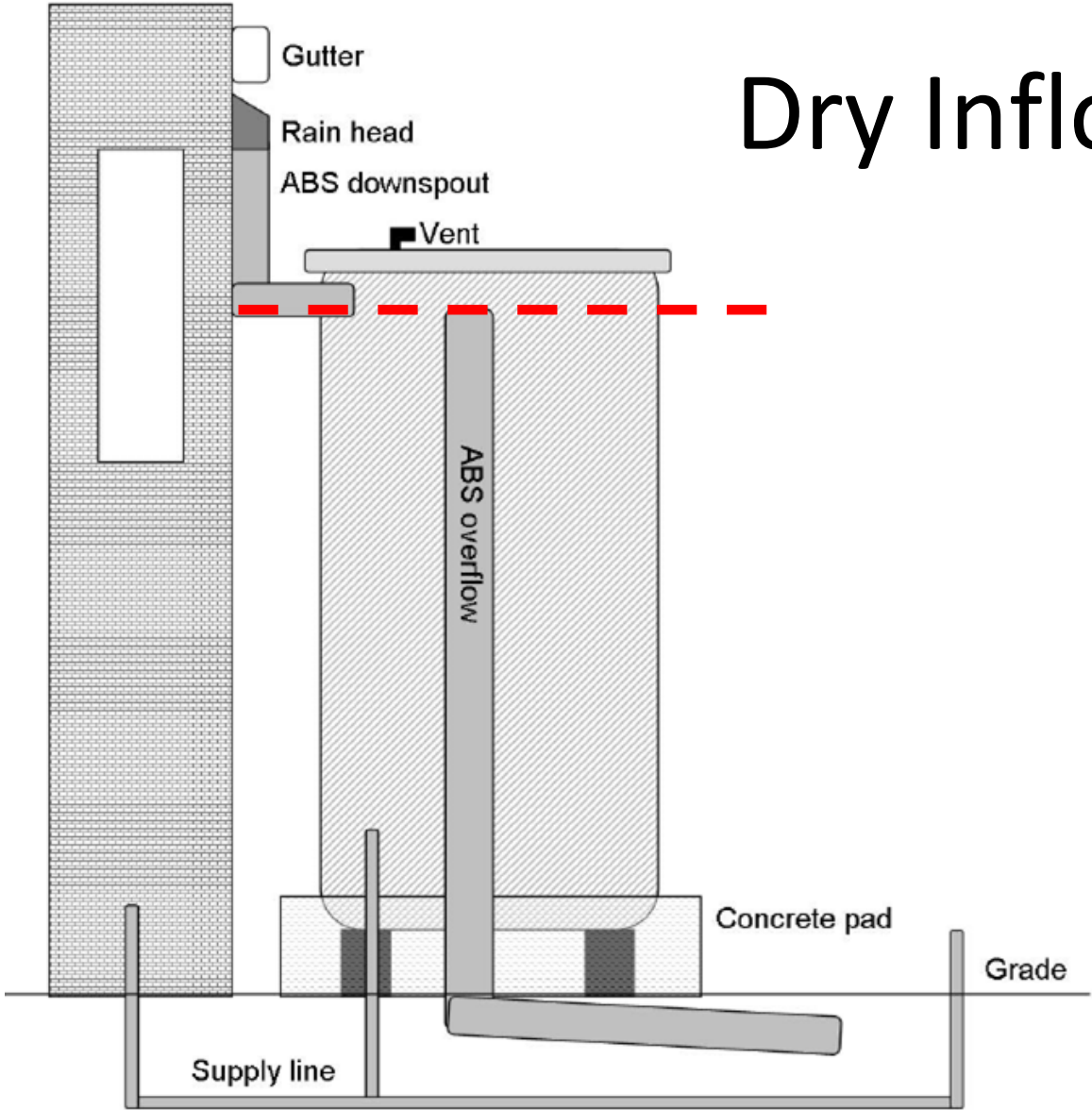
BASE/FOUNDATION

OVERFLOW

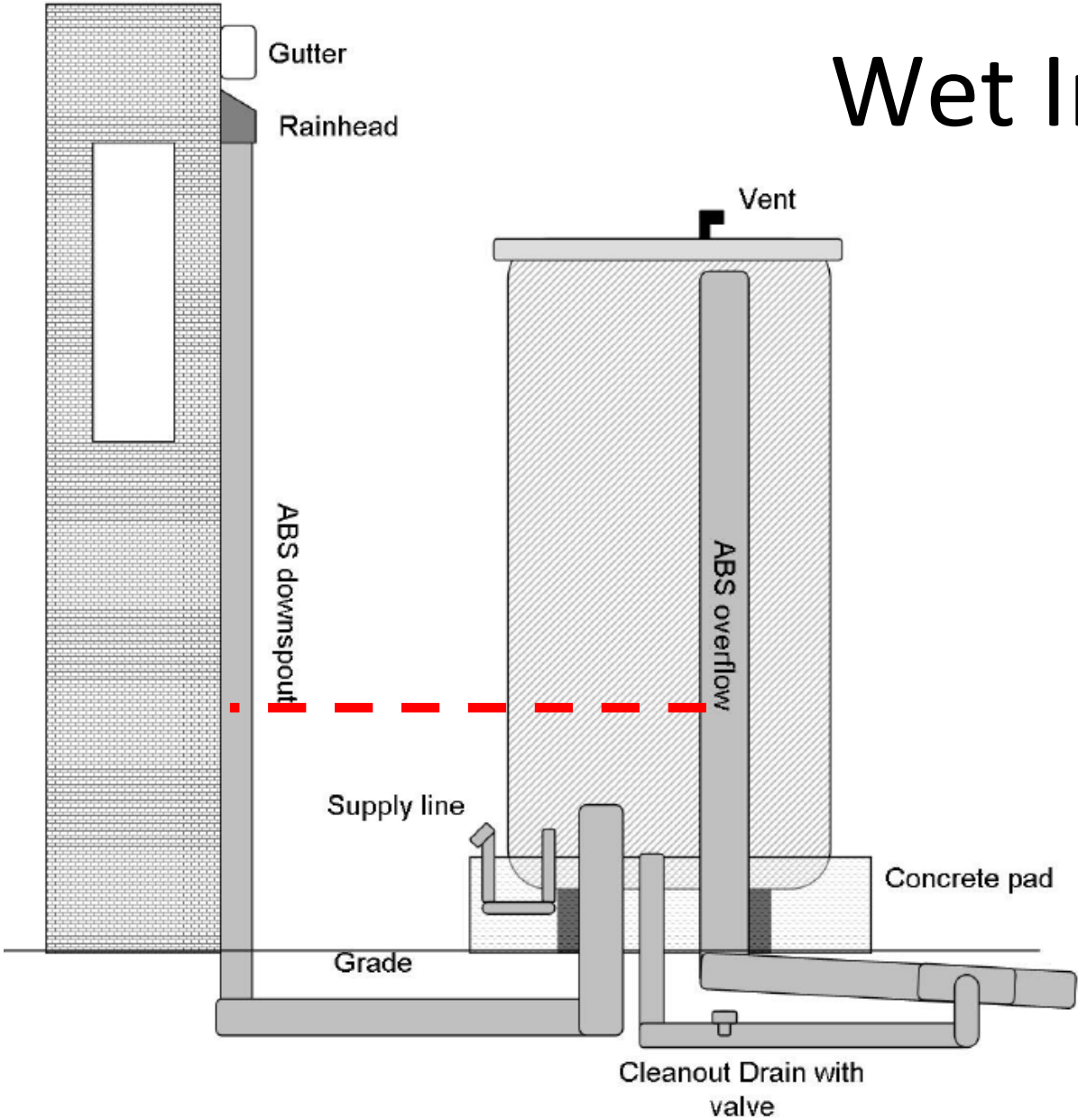
BASIN

IRRIGATION

Dry Inflow



Wet Inflow











Critical Features

- Water tight
- Light proof
- Vented
- Mosquito proof
- Critter proof
- UV resistant
- Planned overflow





Troubleshooting



Troubleshooting



Maintenance

Inspection:

- Check for leaks or wet areas
- Check and clear debris from gutters and downspout, and downspout tubes are well secured
- Check overflow outlet, clear out any debris
- Check to be sure adult mosquitoes do not have access
- Empty first flush after each rainfall event
- Clean out bottom sediment layer if needed (only if >3-4" sediment layer)

Winter Preparation:

- Insulate all supply pipes and fixtures which contain water.
- In colder climates if the tank itself is not buried or insulated properly then the tank and supply lines may need to be drained completely to prevent freezing.



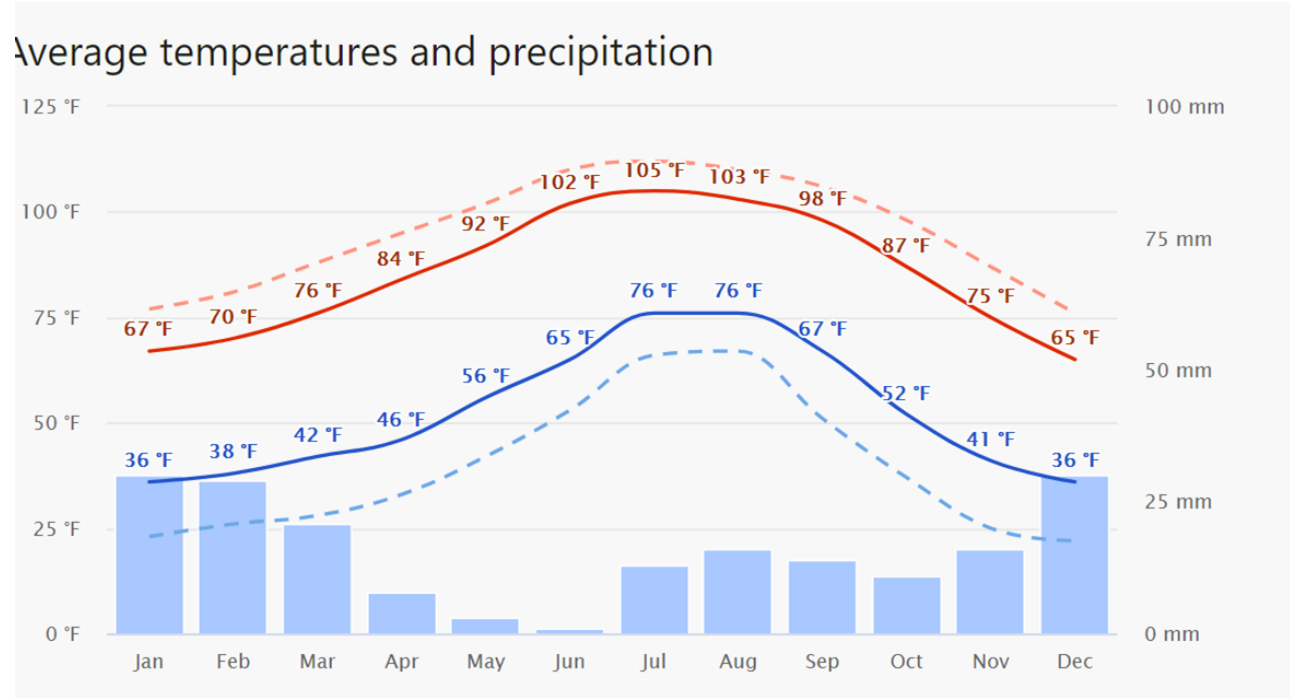
How large of a rain tank do I need? It depends...

TANK SIZING

San Tan Valley Rainfall

Average Rainfall
9.9 Inches

Rainy Seasons



<https://www.meteoblue.com/>

Capture events from multiple storms – cumulative rainfall over a period.

Aim to capture rainfall from the entire monsoon or winter rain season = ~4 inches

- A tank that captures 1" of rain – good
- A tank that captures 2" of rain – better
- A tank that captures 3-4" of rain – best?

Tank sized based on catchment area

Source: Rooftop runoff

Activity: Calculate your rooftop runoff from 1", 2", 3", and 4" of rain.

Formula: Square feet of roof x 0.623 x runoff coefficient x inches of rain

Example: Cindy Cistern has a 1,500 square foot home with an asphalt shingle roof and she wants to capture 4" of rain in her cistern.

Answer: $1,500 \times 0.623 \times 0.9$ runoff coefficient x 4" of rain = 3,364 gallons of water. Ambitious!

She will compromise on two 1,500 gallon cisterns – one on each side of her home.

Match tank to plants' needs

Tanks may not cover the entire need of backyard gardens, but they can help greatly reduce the need for municipal water sources.

Activity: Calculate the annual water need for your garden.

Formula for vegetable garden: Square footage x 40

Example: Gardener Greg has a 5 x 10 garden.

Answer: $5 \times 10 \times 40 = 2,000$ gallons per year

Complete answer: $2,000 / 2 = 1,000$ gal *per season*

Calculate Discrepancies

1. How many gallons of rainwater can your cistern(s) hold per rain season?
2. How many gallons of water do your veggies need per season?
3. How much water will be needed that the cistern cannot provide?
4. How will you provide this water?
5. OR, if there is excess water, what can you use it for?

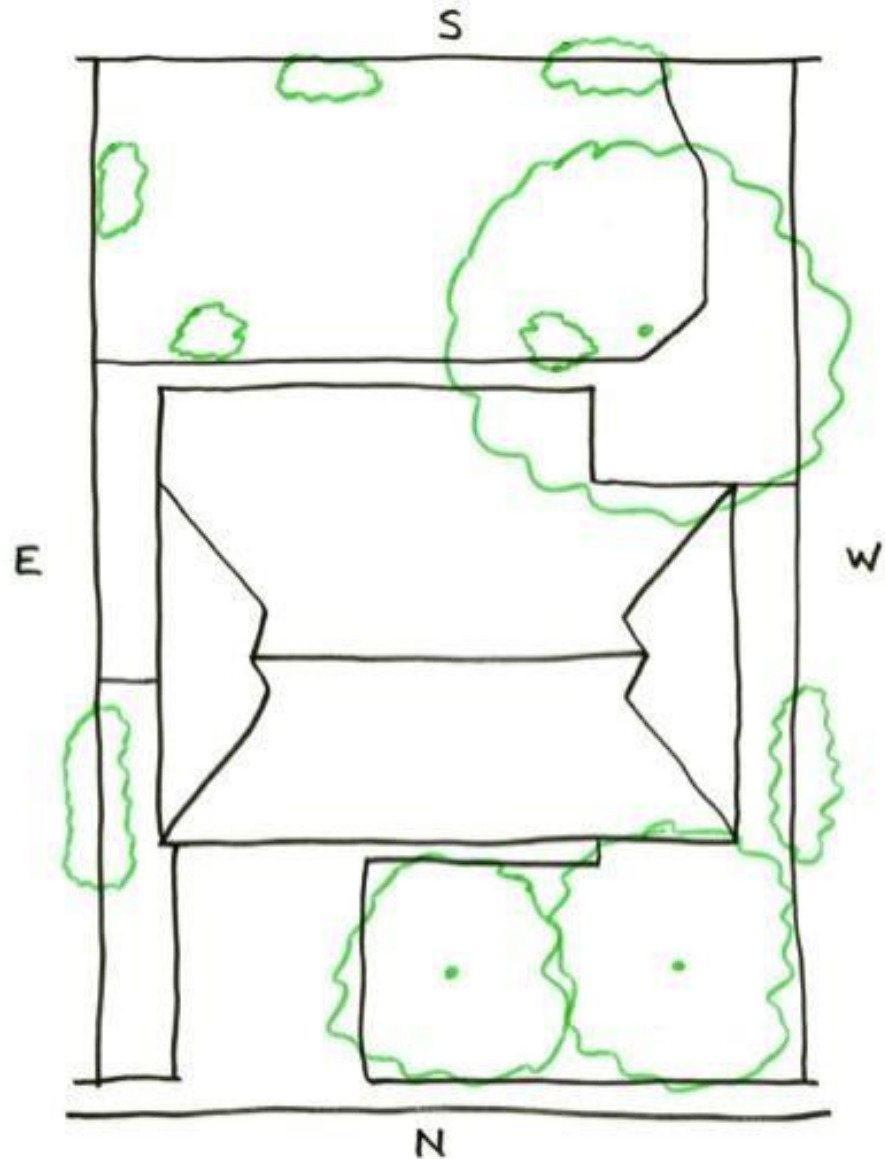
Cistern Placement

Activity: Draw cisterns into your site plan (started in Week 1).

Based on placement of gutters, human use/access, and stacking functions, where in your yard is the best spot to place your cistern(s)?

Site Plan (from Week 1)

- Property lines
- House
- Other permanent structures (storage sheds, pool, driveway, sidewalks, etc.)
- Existing trees and shrubs
- Mark direction - North, South, East, West



Thank You!!!



Phoenix Green Living Co-op Project 10/12/2013