WET & DRY CONVEYANCE

MIXED USE / TRANSFER

JAMES GRIZZARD, HARVEST RAIN

ARCSA® INTERNATIONAL
TECHNICAL SYMPOSIUM
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HARVEST RAIN.TX

Based in Dripping Springs, Harvest Rain designs and installs whole-home potable and irrigation rainwater systems across Texas with a focus on serviceability and integration into the overall property design.

OUTLINE

- “Dry” and “Wet” Pipe Conveyance
- Mixed Use and Transfer Systems
- Application of Transfer Systems at Large Scale
- Opportunities for Unique Capture (Detention/Storm)

DRY PIPE

"When the rain stops,
the conveyance is empty."

DRY PIPE: **PROS**

- Relatively straightforward to size/design

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- Limited Concern of Freeze Damage

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- Relatively Straightforward to Size/Design
- Limited Concern of Freeze Damage
- No Trenching/Less Infrastructure


RESTROOMS


1
2
3
4
5
6

Texas A&M

Rainwater Collection and Condensate Capture

Texas A&M

Large free standing butterfly roof provides covered walkway and 17,500sf of potential collection surface

Capture Potential: 10,900 gallons per 1” of rainfall

Texas A&M

Integrated design of rainwater tanks inside of support columns

Total storage volume in “Column Tanks”: 36,000 gallons

Texas A&M

Column tanks drain to 40,000 gallon buried Xerxes fiberglass tank in adjacent field.

Total Storage Capacity: 76,000 gallons


Approximately
24,000 Gallons

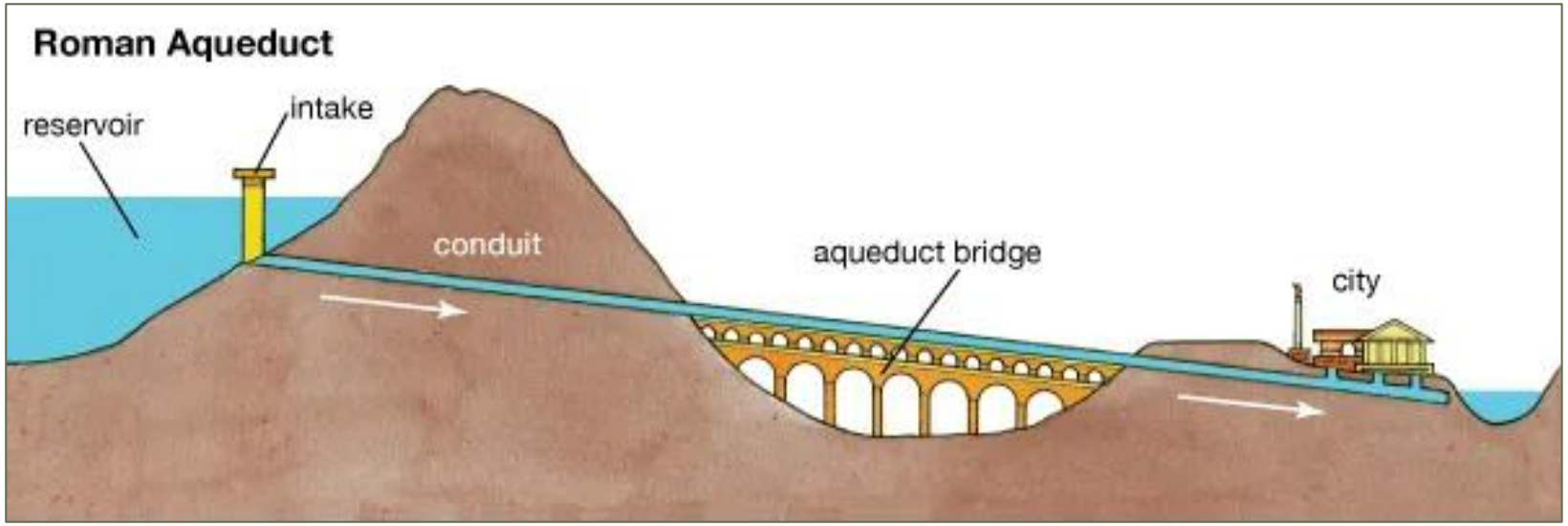
DRY PIPE: ***LIMITATIONS***

- Limited Roof Capture
- Tank Placement
- Vulnerable Conveyance Infrastructure

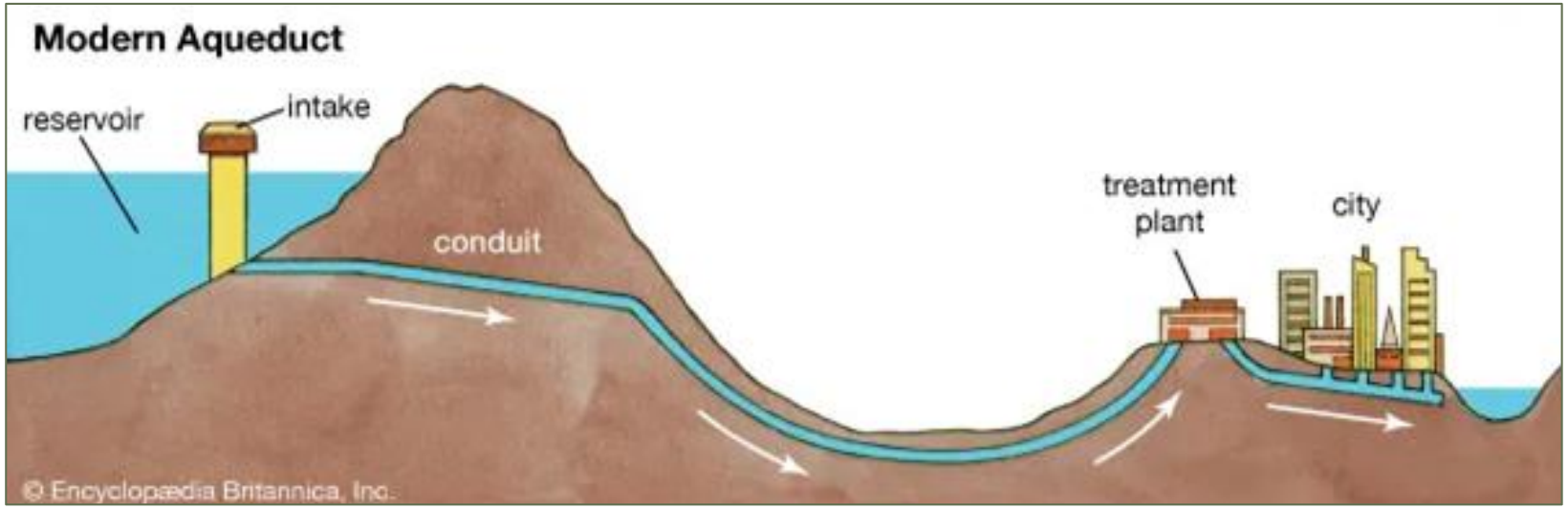
WET PIPE

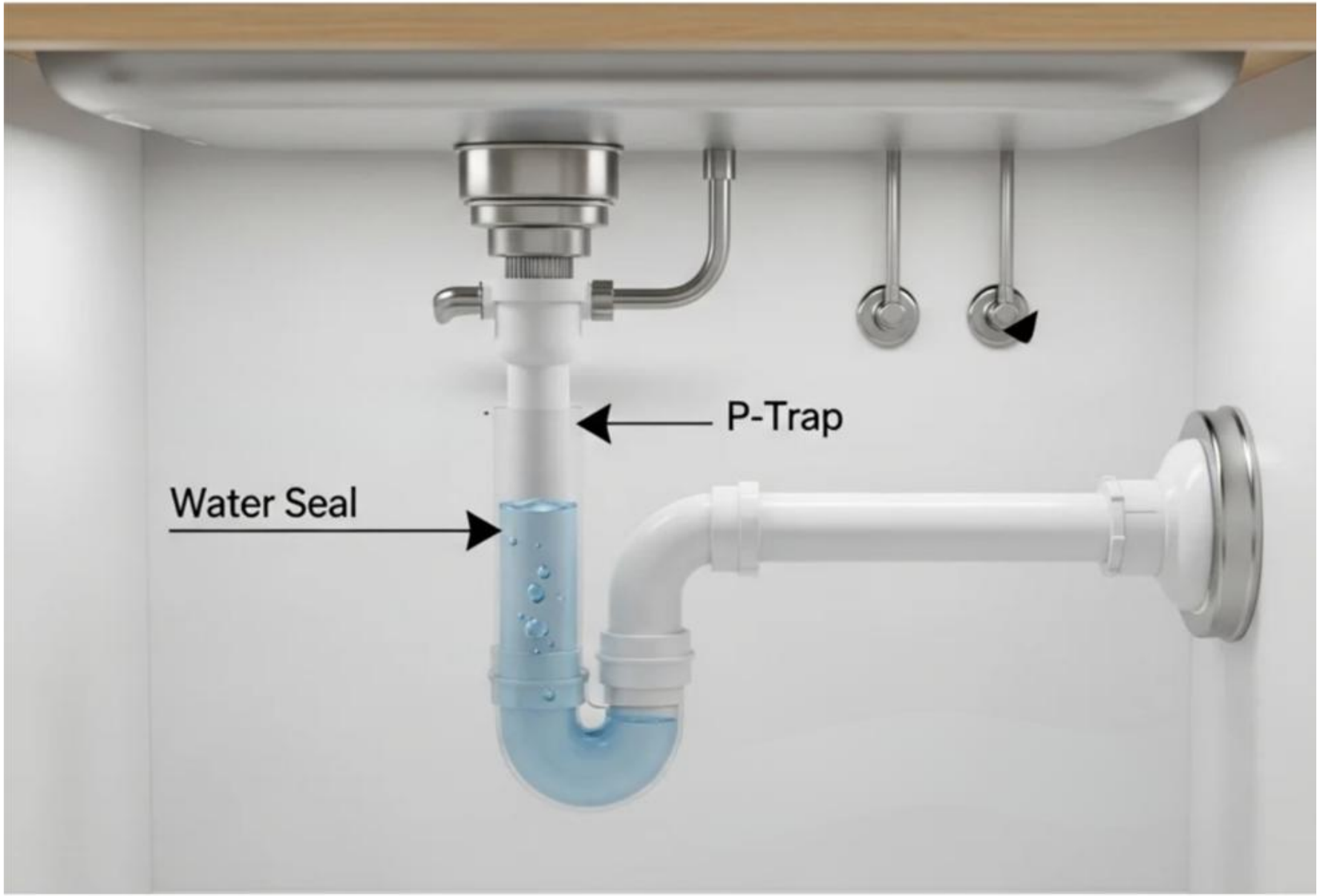
"When the rain stops,
the conveyance remains charged."

DRY PIPE



WET PIPE




P-Trap
Water Seal

WET PIPE: ***PROS***

- Full Roof Capture

Champions Ranch

- Approximately 34,000 square feet
- 21,000 gallons on 1” of rain
- 588,000 gallons annually

Tank Capacity: 181,829 Gallons

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Gonzales, TX Property

- Approximately 44,500 square feet
- 27,000 gallons on 1” of rain
- 972,000 gallons annually

Total Capacity: 170,000 gallons
(2 X 65,000 gallons)

WET PIPE: ***PROS***

- Full Roof Capture
- Tank Placement

WET PIPE: ***PROS***

- Full Roof Capture
- Tank Placement
- Protected Infrastructure

WET PIPE: ***CHALLENGES***

- Head Pressure / Height Differential

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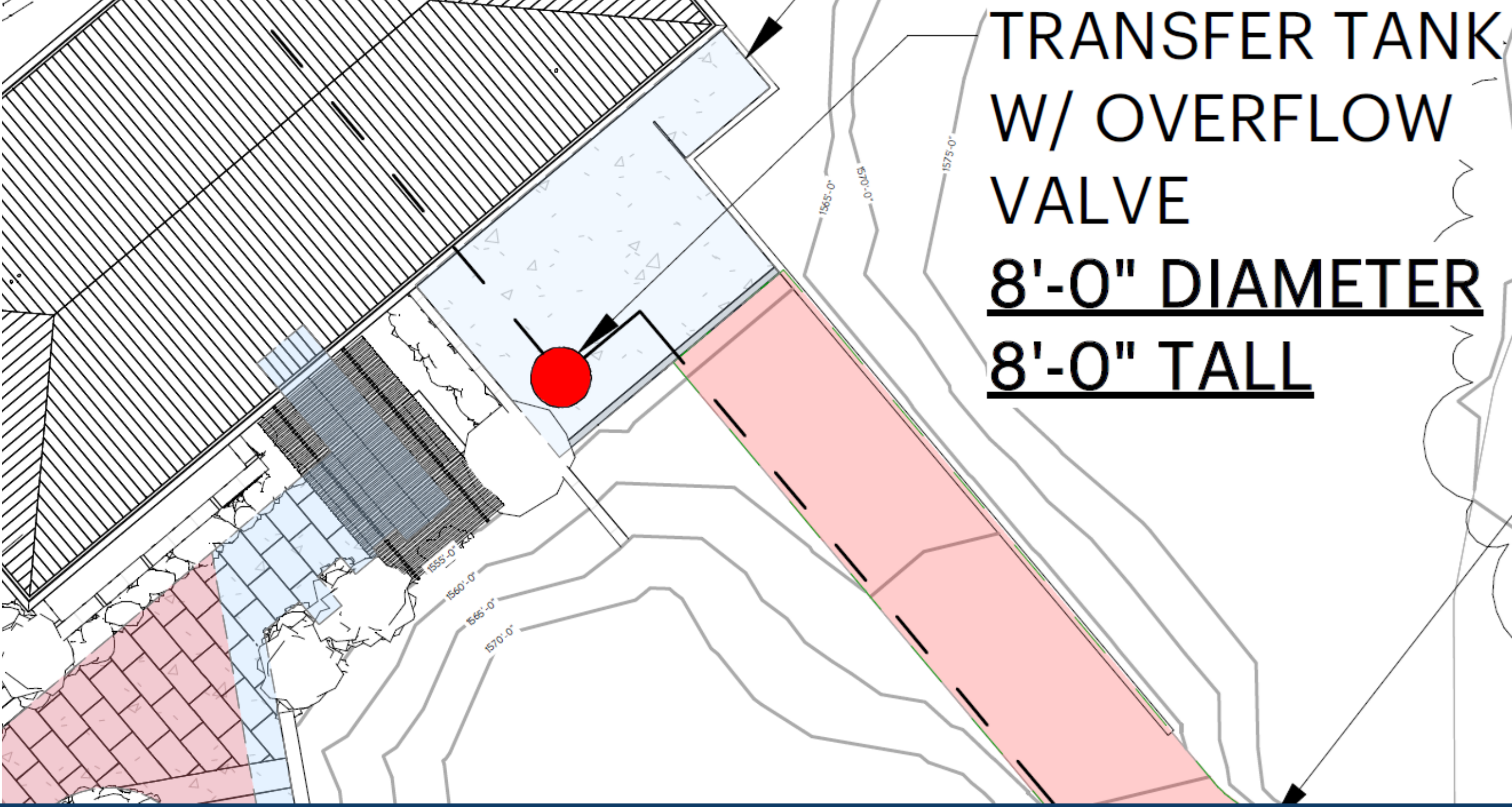
- Conveyance Sizing (Rainfall Intensity, Total Collection Area, Pipe Routing)

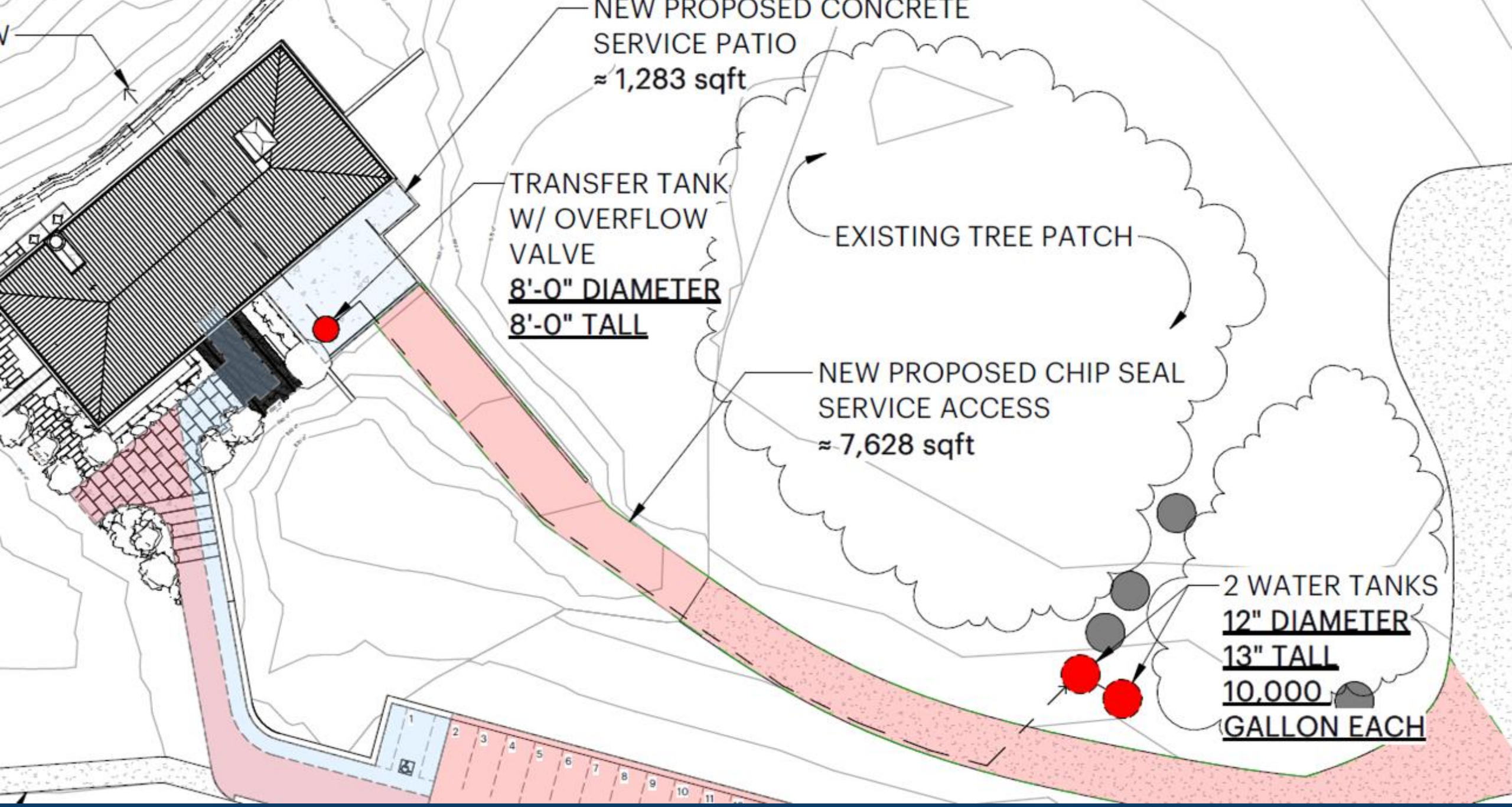
WET PIPE: **CHALLENGES**

- Head Pressure / Height Differential
- Conveyance Sizing
  (Rainfall Intensity, Total Collection Area, Pipe Routing)
- Proper First Flush and Conveyance Line Drain Design
  (Water Quality / Freeze Protection)

TRANSFER SYSTEMS

Beyond the Romans

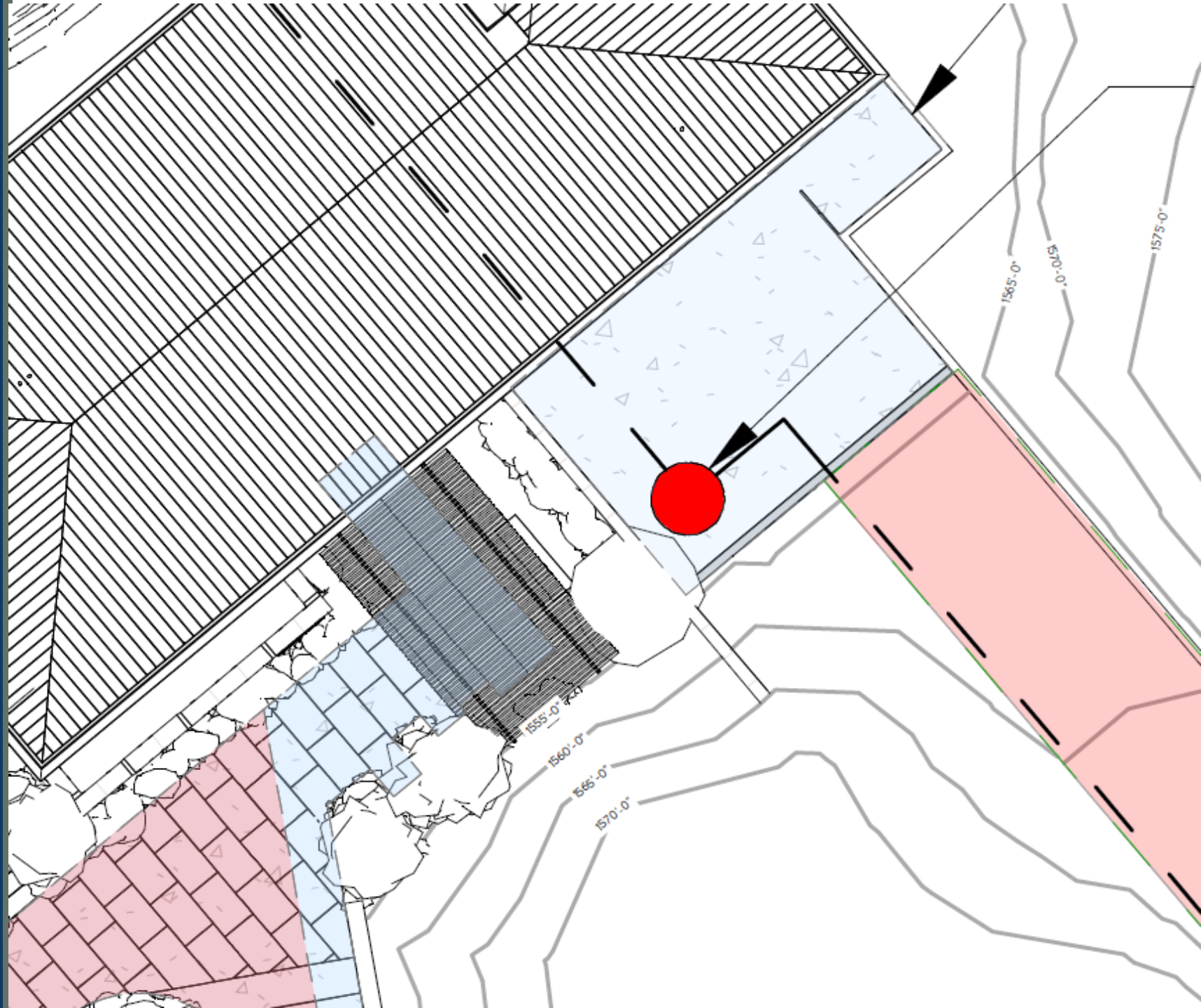

TRANSFER TANK
W/ OVERFLOW
VALVE
8'-0" DIAMETER
8'-0" TALL
1565'-0"
1570'-0"
1575'-0"
1555'-0"
1560'-0"
1565'-0"
1570'-0"


NEW PROPOSED CONCRETE
SERVICE PATIO
≈ 1,283 sqft
TRANSFER TANK
W/ OVERFLOW
VALVE
8'-0" DIAMETER
8'-0" TALL
EXISTING TREE PATCH
NEW PROPOSED CHIP SEAL
SERVICE ACCESS
≈ 7,628 sqft
2 WATER TANKS
12" DIAMETER
13" TALL
10,000
GALLON EACH

TRANSFER SYSTEM

- Approximately 6,400 square feet
- 3,950 gallons on 1” of rain
- In-flow into transfer tank during 3” per hour rain event = 197 GPM
- At 15 minutes = 2,955 gallons

With high flow transfer pump moving 60 GPM, a 2,000 gallon transfer tank necessary to capture all water available during 15 minute rain event.



TRANSFER SYSTEM

Transfer Pump: Goulds Submersible Dewatering Pump (1DW)

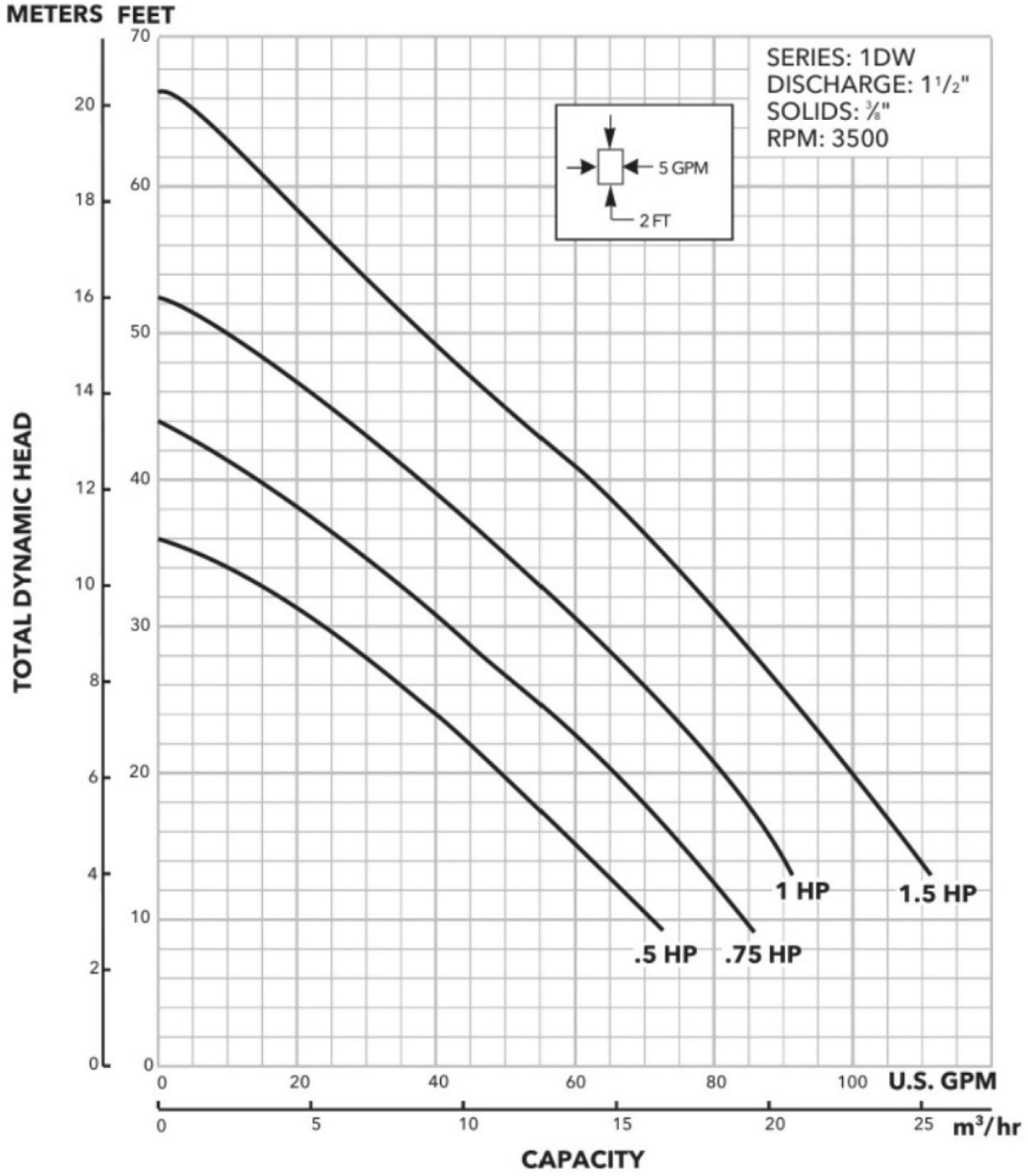
Stainless Steel Impeller in protected oil casing

Up to ~110GPM

High power demand, especially in situations where multiple transfer pumps are required

No ability to dead-head the pump, if it's on, it's transferring.

Depending on application, kill switch will prolong life of pump.



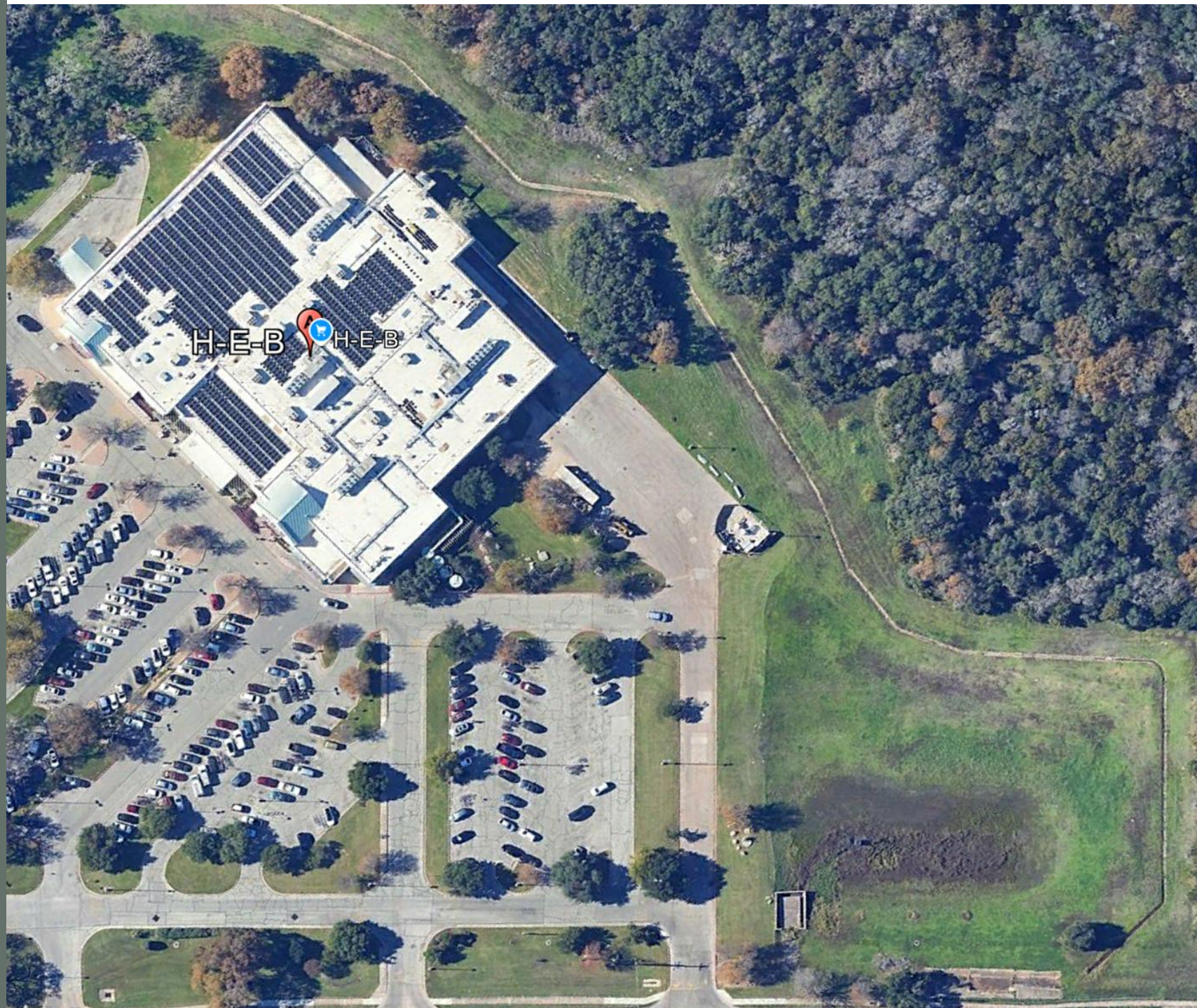
TRANSFER SYSTEMS

Stormwater Retrofit Applications

DETENTION PONDS

Massive capture potential from commercial site drainage

Allows for installation of taller cisterns in limited space due to existing infrastructure.



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Allows for installation of taller cisterns in limited space due to existing infrastructure

Surface Water is much dirtier than rooftop collection. Additional levels of filtration required depending on end use

Electrical supply challenges

Q&A

THANK YOU!