

CASE STUDY 2

SITE & BUILDING WATER USE

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MOSCOW WATER WORKS



DETAIL
PG. 5



BUILDING DESCRIPTION: THIS IS LOCATED ON THE NORTHWEST CORNER OF W A ST & N MAIN ST. IT HOUSES OFFICES FOR THE WATER DEPARTMENT THAT MAINTAINS WATER PRODUCTION WELLS, SUPPLIES DRINKING WATER AND MAINTAINS DISTRIBUTION SYSTEMS: FIRE HYDRANTS, RESERVOIRS, VALVES AND METERS.

BUILDING INVENTORY

OCCUPANTS:

- 7

FIXTURES:

- 2 TOILETS
- 1 DRINKING FOUNTAIN
- 1 SERVICE SINK
- 2 LAVATORY SINKS

FIXTURE TYPE	MEN	WOMEN	EITHER	RECYCLABLE?
1 PIECE GRAVITY TOILET	4	3	-	NO-WATER
WALL MOUNTED DRINKING FOUNTAIN	-	-	7	YES-GREY WATER
MOP SINK	1	-	-	NO-BLACK WATER
BATHROOM SINK	4	3	-	YES-GREY WATER

WATER USE CURRENT CONDITIONS

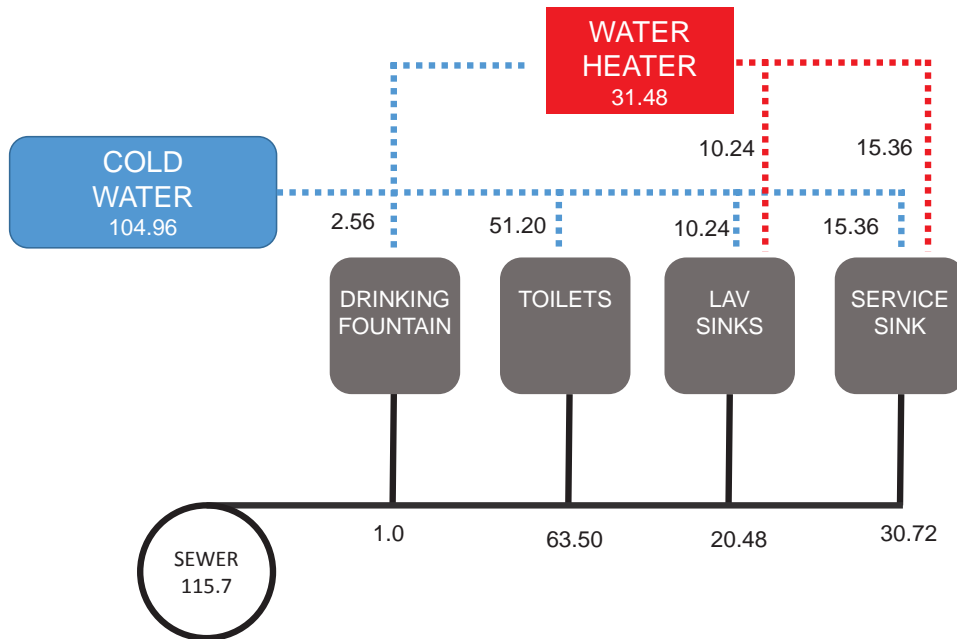
7 OCCUPANTS X 15 GALLONS PER PERSON = 105 GALLONS PER DAY

	#	WSFU	FU	GPF
LAV SINK	2	1	2	20.48
FOUNTAIN	1	.25	.25	2.56
SERVICE SINK	1	1.5	3	30.72
TOILET	2	2.5	5	51.20
TOTAL			10.25	104.96

The diagram illustrates the water flow from various fixtures. Arrows point from the 'LAV SINK', 'FOUNTAIN', and 'SERVICE SINK' rows of the table to a central brown unit. From this unit, arrows point to a toilet and another sink. The 'TOILET' row also has a direct arrow to the toilet. The 'TOTAL' row has an arrow pointing to the toilet.

GPFU= 105GAL/10.25FU
 GPFU=10.24
 GPF=FU(10.24)

WATER USE (CONTINUED)



STORMWATER CURRENT CONDITIONS



WISESCAPING



CURRENTLY THE BUILDING SQUAREFOOTAGE IS 3550 SQFT AND THE IMPERMEABLE PARKING LOT HAS 3680 SQFT. THE SITE IS NOT UTILIZING THEIR WATER COLLECTION POSSIBILITIES. INSTEAD THE CITY OF MOSCOW DEVELOPED A CONCEPT CALLED WISESCAPING. WISESCAPING ALLOWS FOR WATER SAVINGS, LESS MOWING, LESS LABOR AND LESS CHEMICAL USE.

STORMWATER OPPORTUNITIES

Precipitation

Month	Average Precipitation (inches)	Average Snowfall (inches)
January	3.01	16.1
February	2.18	8.8
March	2.35	5
April	1.94	1.2
May	2.06	0.1
June	1.67	0
July	.71	0
August	.79	0
September	1.20	0
October	1.88	0.3
November	3.07	5.5
December	2.95	12.6
Total Average Precipitation	23.81	49.8



DETAIL ROOF WATER MANAGEMENT SYSTEM



THERE IS A TOTAL OF 7,230 SQFT OF AREA TO COLLECT WATER ONSITE. THE AVERAGE ANNUAL PERCIPITATION IN MOSCOW IS 23.81 INCHES. WHEN CALCULATED THE AMOUNT OF RAIN WATER THAT CAN BE COLLECTED OFF THE ROOF IS $(1.98 \text{ ft}^2 \times 3550 \text{ ft}^2) = 7,029 \text{ ft}^3 \times 7.48 \text{ gallons} = 52,000 \text{ gallons}$. THE AMOUNT OF RAIN WATER THAT PARKING LOT CAN COLLECT $(1.98 \text{ ft}^2 \times 3680 \text{ ft}^2) = 7286 \text{ ft}^3 \times 7.48 \text{ gallons} = 54,000 \text{ gallons}$. TOTALLING 106,000 gallons OF POSSIBLE RAINWATER COLLECTION.

IMPLEMENTING STORMWATER COLLECTION

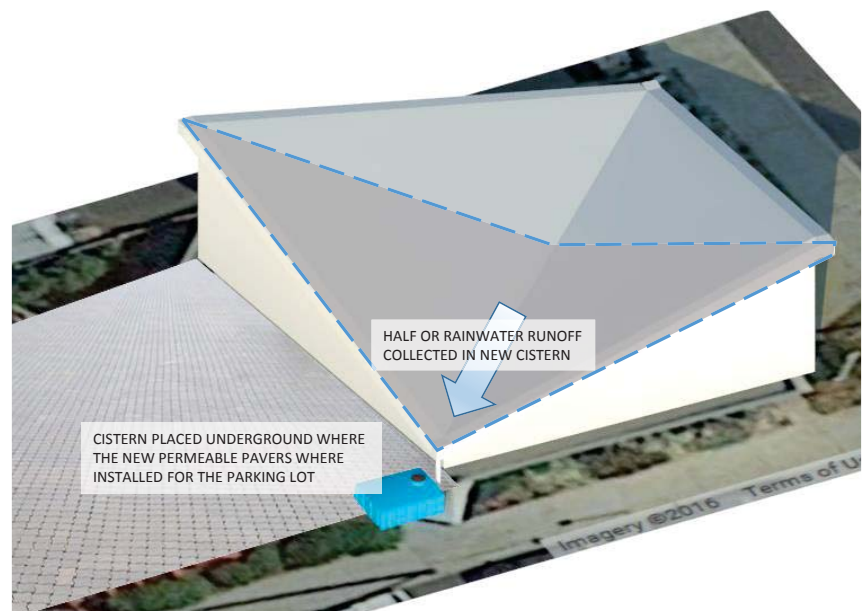
THE ROOF AREA IS 3550 ft².

JANUARY, MARCH, MAY, JULY, AUGUST, OCTOBER, DECEMBER ARE ALL MONTHS THAT ARE 31 DAYS. WE CALCULATED THE MEAN OF ALL THE PRECIPITATION WHICH IS 1.96".

CALCULATE $G = (1.96" \times 1,775 \text{ ft}^2) / (2.15) = 1,618 \text{ gallons}$. WE DECIDED THAT A RECTANGULAR CISTERN WOULD BE ENOUGH TO HOLD THE WATER.

CISTERN SIZE = $(1618 \times 1.5) / 7.48 = 324.47 \text{ ft}^3$

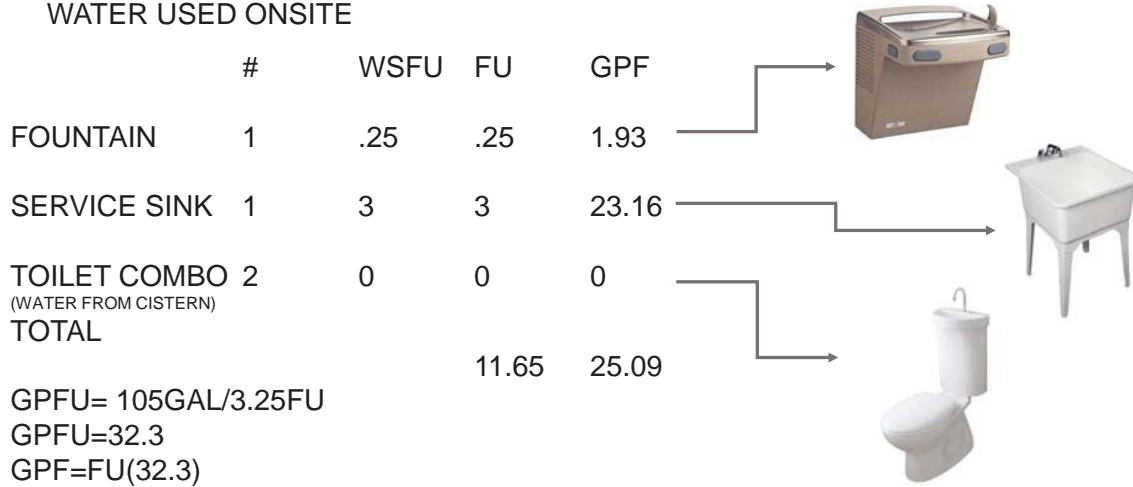
CISTERN DIMENSIONS = 8 x 8 x 4



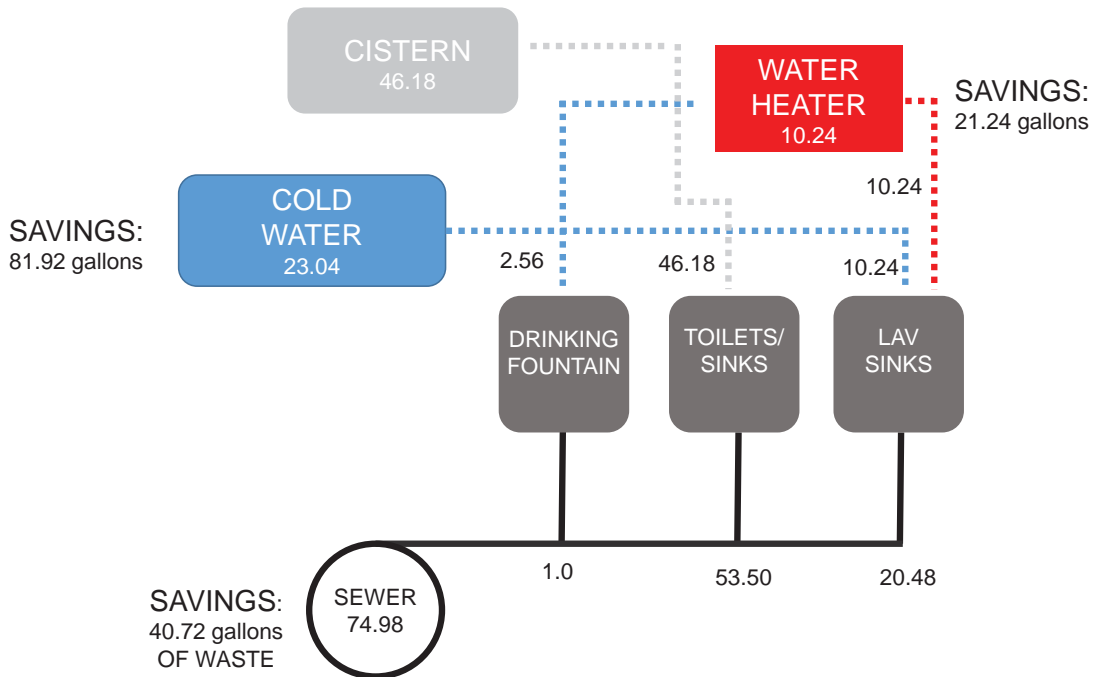
REDESIGNED WATER USE

SOME STRATEGIES INCLUDE:

- REPLACING ORIGINAL TOILETS WITH NEW SINK-TOILET COMBOS (CAROMA PROFILE SMART 305).
- USING GREY WATER AS WELL AS COLLECTED RAINWATER FROM CISTERN IN LAV-TOILETS TO REDUCE THE AMOUNT OF CITY WATER AS WELL AS WASTE WATER USED ONSITE



REDESIGNED WATER USE (CONTINUED)



CONCLUSION

- CURRENTLY THE MOSCOW WATER WORKS USES ALL CONVENTIONAL FIXTURES
- THE REDESIGNED WATER USE PLAN SAVED ABOUT 81.92 gallons OF WATER PER DAY OR ABOUT 80%. THE MAJORITY OF THIS SAVINGS WAS BY REMOVING THE LAV SINKS AND TOLIETS AND REPLACING THEM WITH CARMONA PROFILE SMART 305 TOILET SINK COMBO.
- THE ADDITION OF THE CISTERN ALSO ALLOWED FOR THE RAINWATER TO BE USED ON THE NEW TOILETS
- THE ADDITION OF PERMEABLE PAVER PARKING LOT ALSO ALLOWED FOR THE RAIN TO BE USED ONSITE INSTEAD OF BEING FED BACK INTO THE SEWERS.