Hydraulic Conductivities and Calculations of Ground Water Volumes and Infiltration Rates

Well No.	Depth to Ground Water in feet below surface	Slug Test (ft/d) K_{in}	Slug Test (ft/d) K_{out}	Pump Test (ft/d) K	K_{AVG} ft/d	Volume of Existing Ground Water in Excavation in gallons (based on porosity)	Average Predicted Infiltration Rate over time Excavation is open in gpm (assuming 4 hours)	Volume of Ground Water seeping into Excavation in gallons (includes 1.5 safety factor)	Total Ground Water to Manage in gallons (existing water plus seepage)
RCH-2-ENV-3W	2.53			0.0320	**0.03**	4,583	0.15	36	4,618
RCH-3-ENV-2W	12.64								
RCH-4-ENV-20W	3.6	2.99	2.66	2.70	**2.78**	3,686	10.36	2,487	6,173
RCH-4H-ENV-2W	2.3	1.88	1.67	0.755	**1.44**	4,775	67	16,001	20,777
RCH-4-ENV-25W	2.72	20.63	20.99	36.02	**25.88**	4,423	115.61	27,747	32,170
RCH-4H-ENV-5W	1.65			4.18	**4.18**	5,320	22	5,390	10,710
RCH-4-ENV-29W	1.74	1.51	0.95		**1.23**	5,244	6.51	1,563	6,808
RCH-4-ENV-33W	5.24	*11.31*	*14.6*	3.82	**3.82**	2,312	8.92	2,141	4,453
RCH-5H-ENV-1W	6.83	0.20	0.46		**0.33**	980	0.3	78	1,059
RCH-5H-ENV-3W	6.89	0.42	5.72		**3.07**	930	2.9	692	1,622
RCH-5H-ENV-6.1W	5.46	0.45	1.25		**0.85**	2,128	1.8	438	2,566
RCH-6-ENV-2W	2.3	*84.91*	13.02	14.63	**13.83**	4,775	67	16,001	20,777
RCH-6-ENV-5W	1.64	*10.30*	4.81		**4.81**	5,328	26	6,212	11,540
NYC-2-ENV-1W	6.78			104.59	**104.59**	1,022	108	25,910	26,932

= DTW below bottom of trench

K values in *italics* not used in average

Assumed trench dimensions:

L= 40 ft
W= 8 ft
D= 8 ft

Range of infiltration rates	
	< 5 gpm
	5 to 15 gpm
	15 to 70 gpm
	>70 gpm

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q	groundwater flow into excavation (gallons/d)		
K	hydraulic conductivity (ft/d)		
i	hydraulic gradient		
A	side wall cross-sectional area		
ne	effective porosity		

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	4.72	ft below surface	
K	1299.00	ft/d	4.583E+00 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.3	ft/ft	
Longer Sidewalls (lsw) Saturated Area	262.4	sq ft	
Shorter Sidewalls (ssw) Saturated Area	52.48	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	50992	gpd	accounts for both long sidewalls
Qssw	10198	gpd	accounts for both short sidewalls
Qb	3399486	gpd	
Total Volume of GW entering Excavation	865,169	gallons	includes safety factor
Average Predicted Infiltration Rate	3,604.9	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	2,748	gallons	solely based on porosity
Total Potential GW to Manage	867,917	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities

$Q = K \times I \times A/ne$, where

Q	groundwater flow into excavation (gallons/d)	
K	hydraulic conductivity (ft/d)	
i	hydraulic gradient	
A	side wall cross-sectional area	
ne	effective porosity	

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	3.23	ft below surface	
K	1.75	ft/d	6.174E-03 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.4	ft/ft	
Longer Sidewalls (lsw) Saturated Area	381.6	sq ft	
Shorter Sidewalls (ssw) Saturated Area	76.32	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	100	gpd	accounts for both long sidewalls
Qssw	20	gpd	accounts for both short sidewalls
Qb	6660	gpd	
Total Volume of GW entering Excavation	1,695	gallons	includes safety factor
Average Predicted Infiltration Rate	7.1	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	3,996	gallons	solely based on porosity
Total Potential GW to Manage	5,691	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities

$Q = K \times I \times A/ne$, where

Q	groundwater flow into excavation (gallons/d)	
K	hydraulic conductivity (ft/d)	
i	hydraulic gradient	
A	side wall cross-sectional area	
ne	effective porosity	

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	5.46	ft below surface	
K	1.25	ft/d	4.410E-03 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.2	ft/ft	
Longer Sidewalls (lsw) Saturated Area	203.2	sq ft	
Shorter Sidewalls (ssw) Saturated Area	40.64	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	38	gpd	accounts for both long sidewalls
Qssw	8	gpd	accounts for both short sidewalls
Qb	2533	gpd	
Total Volume of GW entering Excavation	645	gallons	includes safety factor
Average Predicted Infiltration Rate	2.7	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	2,128	gallons	solely based on porosity
Total Potential GW to Manage	2,773	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities

$Q = K \times I \times A/ne$, where

Q	groundwater flow into excavation (gallons/d)
K	hydraulic conductivity (ft/d)
i	hydraulic gradient
A	side wall cross-sectional area
ne	effective porosity

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	2.53	ft below surface	
K	0.03	ft/d	1.129E-04 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.5	ft/ft	
Longer Sidewalls (lsw) Saturated Area	437.6	sq ft	
Shorter Sidewalls (ssw) Saturated Area	87.52	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	2	gpd	accounts for both long sidewalls
Qssw	0	gpd	accounts for both short sidewalls
Qb	140	gpd	
Total Volume of GW entering Excavation	36	gallons	includes safety factor
Average Predicted Infiltration Rate	0.1	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	4,583	gallons	solely based on porosity
Total Potential GW to Manage	4,618	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q	groundwater flow into excavation (gallons/d)		
K	hydraulic conductivity (ft/d)		
i	hydraulic gradient		
A	side wall cross-sectional area		
ne	effective porosity		

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	2.3	ft below surface	
K	1.44	ft/d	5.062E-03 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.5	ft/ft	
Longer Sidewalls (lsw) Saturated Area	456	sq ft	
Shorter Sidewalls (ssw) Saturated Area	91.2	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	98	gpd	accounts for both long sidewalls
Qssw	20	gpd	accounts for both short sidewalls
Qb	6526	gpd	
Total Volume of GW entering Excavation	1,661	gallons	includes safety factor
Average Predicted Infiltration Rate	6.9	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	4,775	gallons	solely based on porosity
Total Potential GW to Manage	6,436	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			
Input Values (enter values highlighted in yellow)			
Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	1.65	ft below surface	
K	4.18	ft/d	1.475E-02 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		
Calculated/Predicted Values			
i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.5	ft/ft	
Longer Sidewalls (lsw) Saturated Area	508	sq ft	
Shorter Sidewalls (ssw) Saturated Area	101.6	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	318	gpd	accounts for both long sidewalls
Qssw	64	gpd	accounts for both short sidewalls
Qb	21178	gpd	
Total Volume of GW entering Excavation	5,390	gallons	includes safety factor
Average Predicted Infiltration Rate	22.5	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	5,320	gallons	solely based on porosity
Total Potential GW to Manage	10,710	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q	groundwater flow into excavation (gallons/d)		
K	hydraulic conductivity (ft/d)		
i	hydraulic gradient		
A	side wall cross-sectional area		
ne	effective porosity		

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	6.83	ft below surface	
K	0.33	ft/d	1.164E-03 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.1	ft/ft	
Longer Sidewalls (lsw) Saturated Area	93.6	sq ft	
Shorter Sidewalls (ssw) Saturated Area	18.72	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	5	gpd	accounts for both long sidewalls
Qssw	1	gpd	accounts for both short sidewalls
Qb	308	gpd	
Total Volume of GW entering Excavation	78	gallons	includes safety factor
Average Predicted Infiltration Rate	0.3	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	980	gallons	solely based on porosity
Total Potential GW to Manage	1,059	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities				
Q = K x I x A/ne, where				
	Q	groundwater flow into excavation (gallons/d)		
	K	hydraulic conductivity (ft/d)		
	i	hydraulic gradient		
	A	side wall cross-sectional area		
	ne	effective porosity		
Input Values (enter values highlighted in yellow)				
Excavation Length	40	ft		
Excavation Width	8	ft		
Excavation Depth	8	ft below surface		
Depth to Water	5.46	ft below surface		
K	0.85	ft/d	2.999E-03 cm/s	
Hydraulic Gradient in Region of Excavation	0.005	ft/ft		
Duration of Open Excavation	4	hrs	0.2 days	
Porosity	35%			
effective porosity	25%			
Safety Factor	1.5			
Calculated/Predicted Values				
i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above	
i_{bottom}	0.2	ft/ft		
Longer Sidewalls (lsw) Saturated Area	203.2	sq ft		
Shorter Sidewalls (ssw) Saturated Area	40.64	sq ft		
Bottom (b) Area	320	sq ft		
Qlsw	26	gpd	accounts for both long sidewalls	
Qssw	5	gpd	accounts for both short sidewalls	
Qb	1723	gpd		
Total Volume of GW entering Excavation	438	gallons	includes safety factor	
Average Predicted Infiltration Rate	1.8	gpm	average infiltration rate over the time that the excavation is open	
Volume of Existing GW in Excavation	2,128	gallons	solely based on porosity	
Total Potential GW to Manage	2,566	gallons	includes existing water in excavated volume + seepage volume	

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	6.89	ft below surface	
K	3.07	ft/d	1.083E-02 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.1	ft/ft	
Longer Sidewalls (lsw) Saturated Area	88.8	sq ft	
Shorter Sidewalls (ssw) Saturated Area	17.76	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	41	gpd	accounts for both long sidewalls
Qssw	8	gpd	accounts for both short sidewalls
Qb	2719	gpd	
Total Volume of GW entering Excavation	692	gallons	includes safety factor
Average Predicted Infiltration Rate	2.9	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	930	gallons	solely based on porosity
Total Potential GW to Manage	1,622	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	2.3	ft below surface	
K	13.83	ft/d	4.877E-02 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.5	ft/ft	
Longer Sidewalls (lsw) Saturated Area	456	sq ft	
Shorter Sidewalls (ssw) Saturated Area	91.2	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	943	gpd	accounts for both long sidewalls
Qssw	189	gpd	accounts for both short sidewalls
Qb	62874	gpd	
Total Volume of GW entering Excavation	16,001	gallons	includes safety factor
Average Predicted Infiltration Rate	66.7	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	4,775	gallons	solely based on porosity
Total Potential GW to Manage	20,777	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	1.64	ft below surface	
K	4.81	ft/d	1.697E-02 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.5	ft/ft	
Longer Sidewalls (lsw) Saturated Area	508.8	sq ft	
Shorter Sidewalls (ssw) Saturated Area	101.76	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	366	gpd	accounts for both long sidewalls
Qssw	73	gpd	accounts for both short sidewalls
Qb	24408	gpd	
Total Volume of GW entering Excavation	6,212	gallons	includes safety factor
Average Predicted Infiltration Rate	25.9	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	5,328	gallons	solely based on porosity
Total Potential GW to Manage	11,540	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities

Q = K x I x A/ne, where

Q	groundwater flow into excavation (gallons/d)
K	hydraulic conductivity (ft/d)
i	hydraulic gradient
A	side wall cross-sectional area
ne	effective porosity

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft		
Excavation Width	8	ft		
Excavation Depth	8	ft below surface		
Depth to Water	6.62	ft below surface		
K	5.62	ft/d	1.983E-02	cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft		
Duration of Open Excavation	4	hrs	0.2	days
Porosity	35%			
effective porosity	25%			
Safety Factor	1.5			

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.1	ft/ft	
Longer Sidewalls (lsw) Saturated Area	110.4	sq ft	
Shorter Sidewalls (ssw) Saturated Area	22.08	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	93	gpd	accounts for both long sidewalls
Qssw	19	gpd	accounts for both short sidewalls
Qb	6188	gpd	
Total Volume of GW entering Excavation	1,575	gallons	includes safety factor
Average Predicted Infiltration Rate	6.6	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	1,156	gallons	solely based on porosity
Total Potential GW to Manage	2,731	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			
Input Values (enter values highlighted in yellow)			
Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	1.41	ft below surface	
K	3.12	ft/d	1.101E-02 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		
Calculated/Predicted Values			
i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.5	ft/ft	
Longer Sidewalls (lsw) Saturated Area	527.2	sq ft	
Shorter Sidewalls (ssw) Saturated Area	105.44	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	246	gpd	accounts for both long sidewalls
Qssw	49	gpd	accounts for both short sidewalls
Qb	16405	gpd	
Total Volume of GW entering Excavation	4,175	gallons	includes safety factor
Average Predicted Infiltration Rate	17.4	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	5,521	gallons	solely based on porosity
Total Potential GW to Manage	9,696	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	9.58	ft below surface	
K	0.69	ft/d	2.434E-03 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	-0.1	ft/ft	
Longer Sidewalls (lsw) Saturated Area	-126.4	sq ft	
Shorter Sidewalls (ssw) Saturated Area	-25.28	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	-13	gpd	accounts for both long sidewalls
Qssw	-3	gpd	accounts for both short sidewalls
Qb	-870	gpd	
Total Volume of GW entering Excavation	(221)	gallons	includes safety factor
Average Predicted Infiltration Rate	(0.9)	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	(1,324)	gallons	solely based on porosity
Total Potential GW to Manage	(1,545)	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			
Input Values (enter values highlighted in yellow)			
Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	4.45	ft below surface	
K	0.90	ft/d	3.157E-03 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		
Calculated/Predicted Values			
i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.3	ft/ft	
Longer Sidewalls (lsw) Saturated Area	284	sq ft	
Shorter Sidewalls (ssw) Saturated Area	56.8	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	38	gpd	accounts for both long sidewalls
Qssw	8	gpd	accounts for both short sidewalls
Qb	2535	gpd	
Total Volume of GW entering Excavation	645	gallons	includes safety factor
Average Predicted Infiltration Rate	2.7	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	2,974	gallons	solely based on porosity
Total Potential GW to Manage	3,619	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			
Input Values (enter values highlighted in yellow)			
Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	2.33	ft below surface	
K	5.04	ft/d	1.778E-02 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		
Calculated/Predicted Values			
i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.5	ft/ft	
Longer Sidewalls (lsw) Saturated Area	453.6	sq ft	
Shorter Sidewalls (ssw) Saturated Area	90.72	sq ft	
Bottom (b) Area	320	sq ft	
Q_{lsw}	342	gpd	accounts for both long sidewalls
Q_{ssw}	68	gpd	accounts for both short sidewalls
Q_b	22800	gpd	
Total Volume of GW entering Excavation	5,803	gallons	includes safety factor
Average Predicted Infiltration Rate	24.2	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	4,750	gallons	solely based on porosity
Total Potential GW to Manage	10,553	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	6.78	ft below surface	
K	104.59	ft/d	3.690E-01 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.1	ft/ft	
Longer Sidewalls (lsw) Saturated Area	97.6	sq ft	
Shorter Sidewalls (ssw) Saturated Area	19.52	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	1527	gpd	accounts for both long sidewalls
Qssw	305	gpd	accounts for both short sidewalls
Qb	101808	gpd	
Total Volume of GW entering Excavation	25,910	gallons	includes safety factor
Average Predicted Infiltration Rate	108.0	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	1,022	gallons	solely based on porosity
Total Potential GW to Manage	26,932	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	3.6	ft below surface	
K	2.78	ft/d	9.819E-03 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.4	ft/ft	
Longer Sidewalls (lsw) Saturated Area	352	sq ft	
Shorter Sidewalls (ssw) Saturated Area	70.4	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	147	gpd	accounts for both long sidewalls
Qssw	29	gpd	accounts for both short sidewalls
Qb	9771	gpd	
Total Volume of GW entering Excavation	2,487	gallons	includes safety factor
Average Predicted Infiltration Rate	10.4	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	3,686	gallons	solely based on porosity
Total Potential GW to Manage	6,173	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	2.72	ft below surface	
K	25.88	ft/d	9.130E-02 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.4	ft/ft	
Longer Sidewalls (lsw) Saturated Area	422.4	sq ft	
Shorter Sidewalls (ssw) Saturated Area	84.48	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	1635	gpd	accounts for both long sidewalls
Qssw	327	gpd	accounts for both short sidewalls
Qb	109026	gpd	
Total Volume of GW entering Excavation	27,747	gallons	includes safety factor
Average Predicted Infiltration Rate	115.6	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	4,423	gallons	solely based on porosity
Total Potential GW to Manage	32,170	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
$Q = K \times I \times A/ne$, where			
Q	groundwater flow into excavation (gallons/d)		
K	hydraulic conductivity (ft/d)		
i	hydraulic gradient		
A	side wall cross-sectional area		
ne	effective porosity		

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	1.74	ft below surface	
K	1.23	ft/d	4.339E-03 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.5	ft/ft	
Longer Sidewalls (lsw) Saturated Area	500.8	sq ft	
Shorter Sidewalls (ssw) Saturated Area	100.16	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	92	gpd	accounts for both long sidewalls
Qssw	18	gpd	accounts for both short sidewalls
Qb	6143	gpd	
Total Volume of GW entering Excavation	1,563	gallons	includes safety factor
Average Predicted Infiltration Rate	6.5	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	5,244	gallons	solely based on porosity
Total Potential GW to Manage	6,808	gallons	includes existing water in excavated volume + seepage volume

Estimate of Ground Water to Manage during Trench Excavation Activities			
Q = K x I x A/ne, where			
Q groundwater flow into excavation (gallons/d)			
K hydraulic conductivity (ft/d)			
i hydraulic gradient			
A side wall cross-sectional area			
ne effective porosity			

Input Values (enter values highlighted in yellow)

Excavation Length	40	ft	
Excavation Width	8	ft	
Excavation Depth	8	ft below surface	
Depth to Water	5.24	ft below surface	
K	3.82	ft/d	1.348E-02 cm/s
Hydraulic Gradient in Region of Excavation	0.005	ft/ft	
Duration of Open Excavation	4	hrs	0.2 days
Porosity	35%		
effective porosity	25%		
Safety Factor	1.5		

Calculated/Predicted Values

i_{side}	0.005	ft/ft	uses regional hydraulic gradient inputted above
i_{bottom}	0.2	ft/ft	
Longer Sidewalls (lsw) Saturated Area	220.8	sq ft	
Shorter Sidewalls (ssw) Saturated Area	44.16	sq ft	
Bottom (b) Area	320	sq ft	
Qlsw	126	gpd	accounts for both long sidewalls
Qssw	25	gpd	accounts for both short sidewalls
Qb	8412	gpd	
Total Volume of GW entering Excavation	2,141	gallons	includes safety factor
Average Predicted Infiltration Rate	8.9	gpm	average infiltration rate over the time that the excavation is open
Volume of Existing GW in Excavation	2,312	gallons	solely based on porosity
Total Potential GW to Manage	4,453	gallons	includes existing water in excavated volume + seepage volume