

Base Case Inputs

Estimated Service Life of Structure (LIFE 365) =	50.20	years	
Chloride Diffusion Coefficient Rating =	100%		
Percentage of Structure with More Porous and Higher Diffusion Coefficient :	50%		based on site placement issues
Lower Diffusion Coefficient Rating Relative to Max =	30%		
Asset Initial Costs (Structural Concrete Only)	Concrete Rate Installed = \$ 2,000.00		
	Exposed Surface Area = 871.54	m ²	
	Total Concrete (Estimated) = 263.72	m ³	\$ 527,449.69 Total concrete cost with all costs incl
	Estimated Costs for Spalling Repairs = \$ 2,000.00	m ²	
	Demolition for Concrete Rate = \$ 500.00	m ³	
	Inflation Rate = 2%		

Xypex Concrete Additive Case Inputs

Estimated Service Life of Structure (LIFE 365) =	67.20	years	
Chloride Diffusion Coefficient Rating =	167%	improvement	
Percentage of Structure with More Porous and Higher Diffusion Coefficient :	50%		based on site placement issues
Lower Diffusion Coefficient Rating Relative to Max =	40%		
Asset Initial Costs (Structural Concrete Only)	Xypex Costs Per m3 = \$ 75.00		\$ 19,779.36 Xypex additive costs
	Concrete Rate = \$ 2,075.00		
	Total Concrete (Estimated) = 263.72	m ³	
Estimated Service Life Extension =	17.00	years	
Estimated End of Life Variation =	25.00	years	40% increase in real service life of projects form project testing
Maintenance Interval Improvement Using Xypex =	10.00	years	due to likelihood of lesser extents of porous concrete
Base Case Max Net Present Value =	\$ 1,360,615.90		
Xypex Case Max Net Present Value =	\$ 1,119,948.80		
Improvement in Asset NPV as % =	121%		
Total Net Present Savings =	\$ 240,667.10		
Xypex Cost =	\$ 19,779.36		
Xypex Saving Benefit Factor =	12.17		
Xypex Saving Benefit as % =	1217%		
Future Xypex Benefit Value at the End of Xypex Life Cycle =	\$1,488,101.42		

Project No: 20.06.16.01
Asset Name: Hill Top Reservoir
Date: 16/6/20
Author: JDH



Notes:

Model uses the following parameters in calculations

Base Case

Initial maintenance interval is relative to lowest diffusion coefficient versus service life with works conducted being 30% of the service life the initial maintenance period is based on a 10% surface area. The period along with the below is rounded to the nearest 5th year

Second maintenance interval is relative to initial maintenance plus 5 years with works conducted being another 10% of the surface area (20% total of the lower porous areas remediated at this time)

Third maintenance interval is relative to second maintenance plus 5 years with works conducted being another 10% of the surface area (30% total of the lower porous areas remediated at this time)

Fourth maintenance interval is relative to third maintenance plus 5 years with works conducted being another 10% of the surface area (40% total of the lower porous areas remediated at this time)

Fifth maintenance interval is relative to fourth maintenance plus 5 years with works conducted being another 10% of the surface area (50% total of the lower porous areas remediated at this time)

Sixth maintenance interval will occur at 90% of the service design life after which the 20% of the residual surface (remaining 50%) leaving only 30% surface area that has not been remediated.

Seventh maintenance interval will occur at 110% of the service design life after which the 20% of the residual surface (remaining 50%) leaving only 10% surface area that has not been remediated.

At the deterioration of the original repairs give the same service life as original non treated structure. The structure is considered obsolete and demolished. This value is rounded to the nearest 5 years.

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Xypex Case

In Xypex the initial maintenance period occurs at 40% of the original design life, due to the product activating and filling pores of the more porous concrete the infiltration and porous areas are minimized. Leading to a 10% improvement in the porous areas performance which is conservative comparing typical chloride performance improvement found in laboratory testing and actual project testing. But rounded to the nearest 5th year. The initial maintenance period is again 10% of the surface area

The second maintenance period is spaced further than the original non treated structure due to a 167% improvement (40% reduction in chloride performance) the same area as per the normal concrete is proportioned to this area.

As per the second maintenance period the timeframes are also increased for the maintenance intervals of 3 through to five

This is the sixth maintenance interval which is rounded to the nearest 5th year.

This interval is the initiation of the good 50% of the structures concrete is predicted to start at 100% of the ultimate service life which is a 10% extension due to Xypex densifying and sealing minor cracks which provides extension. This has been seen from project testing.

The area for remediation here is 20% as per the base case

This is the sixth maintenance interval which is rounded to the nearest 5th year.

This interval is the initiation of the good 50% of the structures concrete is predicted to start at 120% of the ultimate service life which is a 10% extension due to Xypex densifying and sealing minor cracks which provides extension. This has been seen from project testing.

The area for remediation here is 20% as per the base case

At the deterioration of the original repairs give the same service life as original treated structure. The structure is considered obsolete and demolished.

This value is rounded to the nearest 5 years. And the service life would be considered base on Xypex treated repairs being used.





