

**WATER QUALITY COMPUTATIONS**

**GOAL:** Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-1C) = = 5.9670 ac = 259,923 s.f.

$A_{i_{ex}}$  = Total Existing Impervious Area = = 0.0000 ac = 0,000 s.f.

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements = = 0.0000 ac = 0,000 s.f.

$A_{i_{pp}}$  = Impervious Area under Redevelopment = = 0.6020 ac = 26,223 s.f.

Liabile Impervious Area for Water Quality = = 0.6020 ac = 26,223 s.f.

Drainage Area Contributing to the Facility = = 5.9670 ac = 259,923 s.f.

$I$  = percent Impervious Area =  $( \frac{A_i}{A} ) ( 100 ) =$   
 $I$  = percent Impervious Area =  $( \frac{0.6020 \text{ ac.}}{5.9670 \text{ ac}} ) ( 100 ) = 10.09 \%$

$R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( I ) ] ) =$   
 $R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( 10.09 ) ] ) = 0.14$  (from design manual, page 2.2)

$P$  = Precipitation Depth = 1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

$WQ_v$  = Water Quality Volume =  $[ ( P ) ( R_v ) ( A ) ] / 12$   
 $WQ_v$  = Water Quality Volume =  $[ ( 1.2 \text{ in.} ) ( 0.141 ) ( 5.9670 \text{ ac} ) ] / 12 = 0.08402 \text{ ac ft} = 3659.69 \text{ cf}$   
 $WQ_v$  required as a permanent volume (50% of  $WQ_v$ ) =  $0.04201 \text{ ac ft} = 1829.85 \text{ cf}$   
 $WQ_v$  provided as a permanent volume @ elevation 686.25 =

**WATER QUALITY COMPUTATIONS**

**GOAL:** Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-ID) = = 7.6020 ac = 331,143 s.f.

$A_{i_{ex}}$  = Total Existing Impervious Area = = 0.0000 ac = 0,000 s.f.

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements = = 0.0000 ac = 0,000 s.f.

$A_{i_{pp}}$  = Impervious Area under Redevelopment = = 2.0910 ac = 91,084 s.f.

Liabile Impervious Area for Water Quality = = 2.0910 ac = 91,084 s.f.

Drainage Area Contributing to the Facility = = 7.6020 ac = 331,143 s.f.

I = percent Impervious Area =  $( \frac{A_i}{A} ) ( 100 ) =$   
 I = percent Impervious Area =  $( \frac{2.0910 \text{ ac.}}{7.6020 \text{ ac}} ) ( 100 ) = 27.51 \%$

$R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( I ) ] =$   
 $R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( 27.51 ) ] = 0.30$  (from design manual, page 2.2)

P = Precipitation Depth = 1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

WQv = Water Quality Volume =  $[ ( P ) ( R_v ) ( A ) ] / 12$   
 WQv = Water Quality Volume =  $[ ( 1.2 \text{ in.} ) ( 0.298 ) ( 7.6020 \text{ ac} ) ] / 12 = 0.22620 \text{ ac ft} = 9853.27 \text{ cf}$   
 WQv required as a permanent volume (20% of WQv) =  $0.04524 \text{ ac ft} = 1970.65 \text{ cf}$   
 WQv provided as a permanent volume @ elevation 634.40 =

**WATER QUALITY COMPUTATIONS**

**GOAL:** Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-1E) = = 8.7840 ac = 382,631 s.f.

$A_{i_{ex}}$  = Total Existing Impervious Area = 0.0000 ac = 0,000 s.f.

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements = 0.0000 ac = 0,000 s.f.

$A_{i_{pp}}$  = Impervious Area under Redevelopment = 2.0910 ac = 91,084 s.f.

Liabile Impervious Area for Water Quality = 2.0910 ac = 91,084 s.f.

Drainage Area Contributing to the Facility = 8.7840 ac = 382,631 s.f.

I = percent Impervious Area =  $( \frac{A_i}{A} ) ( 100 ) =$   
 I = percent Impervious Area =  $( \frac{2.0910 \text{ ac.}}{8.7840 \text{ ac}} ) ( 100 ) = 23.80 \%$

$R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( I ) ] =$   
 $R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( 23.80 ) ] = 0.26$  (from design manual, page 2.2)

P = Precipitation Depth = 1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

WQv = Water Quality Volume =  $[ ( P ) ( R_v ) ( A ) ] / 12$   
 WQv = Water Quality Volume =  $[ ( 1.2 \text{ in.} ) ( 0.264 ) ( 8.7840 \text{ ac} ) ] / 12 = 0.23211 \text{ ac ft} \quad 10110.71 \text{ cf}$   
 WQV required as a permanent volume (20% of WQv) = 0.04642 ac ft 2022.14 cf  
 WQv provided as a permanent volume @ elevation 664.50 =

**WATER QUALITY COMPUTATIONS**

**GOAL:** Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-1G) = = 18.1060 ac = 788,697 s.f.

$A_{i_{ex}}$  = Total Existing Impervious Area = 0.0000 ac = 0,000 s.f.

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements = 0.0000 ac = 0,000 s.f.

$A_{i_{pp}}$  = Impervious Area under Redevelopment = 4.9870 ac = 217,234 s.f.

Liabile Impervious Area for Water Quality = 4.9870 ac = 217,234 s.f.

Drainage Area Contributing to the Facility = 18.1060 ac = 788,697 s.f.

$I$  = percent Impervious Area =  $(A_i / A) (100) =$   
 $I$  = percent Impervious Area =  $(4.9870 \text{ ac.} / 18.1060 \text{ ac}) (100) = 27.54 \%$

$R_v$  = Volumetric Runoff Coeff. =  $(0.05 + [(0.009)(I)]) =$   
 $R_v$  = Volumetric Runoff Coeff. =  $(0.05 + [(0.009)(27.54)]) = 0.30$  (from design manual, page 2.2)

$P$  = Precipitation Depth = 1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

$WQv$  = Water Quality Volume =  $[(P)(R_v)(A)] / 12$   
 $WQv$  = Water Quality Volume =  $[(1.2 \text{ in.})(0.298)(18.1060 \text{ ac})] / 12 = 0.53936 \text{ ac ft} \quad 23494.52 \text{ cf}$   
 $WQv$  required as a permanent volume (20% of  $WQv$ ) = 0.10787 ac ft 4698.90 cf  
 $WQv$  provided as a permanent volume @ elevation 605.50 =

**WATER QUALITY COMPUTATIONS**

**GOAL:** Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-1H) = 5.2560 ac = 228,951 s.f.

$A_{i_{ex}}$  = Total Existing Impervious Area = 0.0000 ac = 0,000 s.f.

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements = 0.0000 ac = 0,000 s.f.

$A_{i_{pp}}$  = Impervious Area under Redevelopment = 1.8440 ac = 80,325 s.f.

Liabile Impervious Area for Water Quality = 1.8440 ac = 80,325 s.f.

Drainage Area Contributing to the Facility = 5.2560 ac = 228,951 s.f.

$I$  = percent Impervious Area =  $( \frac{A_i}{A} ) ( 100 ) =$   
 $I$  = percent Impervious Area =  $( \frac{1.8440 \text{ ac.}}{5.2560 \text{ ac}} ) ( 100 ) = 35.08 \%$

$R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( I ) ] =$   
 $R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( 35.08 ) ] = 0.37$  (from design manual, page 2.2)

$P$  = Precipitation Depth = 1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

WQv = Water Quality Volume =  $[ ( P ) ( R_v ) ( A ) ] / 12$   
 WQv = Water Quality Volume =  $[ ( 1.2 \text{ in.} ) ( 0.366 ) ( 5.2560 \text{ ac} ) ] / 12 = 0.19224 \text{ ac ft} = 8373.97 \text{ cf}$   
 WQV required as a permanent volume (20% of WQv) =  $0.03845 \text{ ac ft} = 1674.79 \text{ cf}$   
 WQV provided as a permanent volume @ elevation 604.50

**WATER QUALITY COMPUTATIONS**

**GOAL:** Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-II) = = 3.7150 ac = 161,825 s.f.

$A_{i_{ex}}$  = Total Existing Impervious Area = 0.0000 ac = 0,000 s.f.

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements = 0.0000 ac = 0,000 s.f.

$A_{i_{pp}}$  = Impervious Area under Redevelopment = 1.7760 ac = 77,363 s.f.

Liabile Impervious Area for Water Quality = 1.7760 ac = 77,363 s.f.

Drainage Area Contributing to the Facility = 3.7150 ac = 161,825 s.f.

$I$  = percent Impervious Area =  $( \frac{A_i}{A} ) ( 100 ) =$   
 $I$  = percent Impervious Area =  $( \frac{1.7760 \text{ ac.}}{3.7150 \text{ ac}} ) ( 100 ) = 47.81 \%$

$R_v$  = Volumetric Runoff Coeff. =  $( 0.05 ) + [ ( 0.009 ) ( I ) ] =$   
 $R_v$  = Volumetric Runoff Coeff. =  $( 0.05 ) + [ ( 0.009 ) ( 47.81 ) ] = 0.48$  (from design manual, page 2.2)

$P$  = Precipitation Depth = 1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

WQv = Water Quality Volume =  $[ ( P ) ( R_v ) ( A ) ] / 12$   
 WQv = Water Quality Volume =  $[ ( 1.2 \text{ in.} ) ( 0.480 ) ( 3.7150 \text{ ac} ) ] / 12 = 0.17842 \text{ ac ft} = 7771.76 \text{ cf}$   
 WQv required as a permanent volume (50% of WQv) =  $0.08921 \text{ ac ft} = 3885.88 \text{ cf}$   
 WQv provided as a permanent volume @ elevation 584.90 =

**WATER QUALITY COMPUTATIONS**

GOAL: Water quality for this development would be addressed structurally.

Data:				
Total Project Site Area (DA-1J) =			= 4.8170 ac =	209,829 s.f.
$A_{i_{ex}}$ = Total Existing Impervious Area			= 0.0000 ac =	0,000 s.f.
Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements			= 0.0000 ac =	0,000 s.f.
$A_{i_{pp}}$ = Impervious Area under Redevelopment			= 1.6630 ac	72,440 s.f.
Liabile Impervious Area for Water Quality			= 1.6630 ac =	72,440 s.f.
Drainage Area Contributing to the Facility			= 4.8170 ac =	209,829 s.f.
$I$ = percent Impervious Area =	$( \quad A_i \quad ) / ( \quad A \quad ) ( \quad 100 \quad ) =$			
$I$ = percent Impervious Area =	$( \quad 1.6630 \text{ ac.} \quad ) / ( \quad 4.8170 \text{ ac} \quad ) ( \quad 100 \quad ) =$	34.52 %		
$R_v$ = Volumetric Runoff Coeff. =	$( \quad 0.05 \quad ) + [ ( \quad 0.009 \quad ) ( \quad I \quad ) ] =$			
$R_v$ = Volumetric Runoff Coeff. =	$( \quad 0.05 \quad ) + [ ( \quad 0.009 \quad ) ( \quad 34.52 \quad ) ] =$	0.36	(from design manual, page 2.2)	
$P$ = Precipitation Depth =				1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

$WQ_v$ = Water Quality Volume =	$[ ( \quad P \quad ) ( \quad R_v \quad ) ( \quad A \quad ) ] / 12$		
$WQ_v$ = Water Quality Volume =	$[ ( \quad 1.2 \text{ in.} \quad ) ( \quad 0.361 \quad ) ( \quad 4.8170 \text{ ac} \quad ) ] / 12$	= 0.17376 ac ft	7568.77 cf
WQV required as a permanent volume (50% of $WQ_v$ )		= 0.08688 ac ft	3784.38 cf
WQV provided as a permanent volume @ elevation 624.75		=	

**WATER QUALITY COMPUTATIONS**

**GOAL:** Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-1K) =  $3.1140 \text{ ac} = 135,646 \text{ s.f.}$

$A_{i,ex}$  = Total Existing Impervious Area =  $0.0000 \text{ ac} = 0,000 \text{ s.f.}$

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements =  $0.0000 \text{ ac} = 0,000 \text{ s.f.}$

$A_{i,pp}$  = Impervious Area under Redevelopment =  $0.5610 \text{ ac} = 24,437 \text{ s.f.}$

Liabile Impervious Area for Water Quality =  $0.5610 \text{ ac} = 24,437 \text{ s.f.}$

Drainage Area Contributing to the Facility =  $3.1140 \text{ ac} = 135,646 \text{ s.f.}$

$I$  = percent Impervious Area =  $( \frac{A_i}{A} ) ( 100 ) =$   
 $I$  = percent Impervious Area =  $( \frac{0.5610 \text{ ac.}}{3.1140 \text{ ac}} ) ( 100 ) = 18.02 \%$

$R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( I ) ] =$   
 $R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( 18.02 ) ] = 0.21$  (from design manual, page 2.2)

$P$  = Precipitation Depth =  $1.2 \text{ in.}$  (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

$WQ_v$  = Water Quality Volume =  $( ( P ) ( R_v ) ( A ) ) / 12$   
 $WQ_v$  = Water Quality Volume =  $( ( 1.2 \text{ in.} ) ( 0.212 ) ( 3,1140 \text{ ac} ) ) / 12 = 0.06606 \text{ ac ft} = 2877.57 \text{ cf}$   
 $WQ_v$  required as a permanent volume (50% of  $WQ_v$ ) =  $0.03303 \text{ ac ft} = 1438.79 \text{ cf}$   
 $WQ_v$  provided as a permanent volume @ elevation 706.60 =

**WATER QUALITY COMPUTATIONS**

**GOAL:** Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-1L) = = 22.8460 ac = 995,172 s.f.

$A_{i_{ex}}$  = Total Existing Impervious Area = = 0.0000 ac = 0,000 s.f.

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements = = 0.0000 ac = 0,000 s.f.

$A_{i_{pp}}$  = Impervious Area under Redevelopment = = 4.9660 ac = 216,319 s.f.

Liabile Impervious Area for Water Quality = = 4.9660 ac = 216,319 s.f.

Drainage Area Contributing to the Facility = = 22.8460 ac = 995,172 s.f.

$I$  = percent Impervious Area =  $( \frac{A_i}{A} ) ( 100 ) =$   
 $I$  = percent Impervious Area =  $( \frac{4.9660 \text{ ac.}}{22.8460 \text{ ac}} ) ( 100 ) = 21.74 \%$

$R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( I ) ] =$   
 $R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + [ ( 0.009 ) ( 21.74 ) ] = 0.25$  (from design manual, page 2.2)

$P$  = Precipitation Depth = 1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

$WQ_v$  = Water Quality Volume =  $[ ( P ) ( R_v ) ( A ) ] / 12$   
 $WQ_v$  = Water Quality Volume =  $[ ( 1.2 \text{ in.} ) ( 0.246 ) ( 22.8460 \text{ ac} ) ] / 12 = 0.56117 \text{ ac ft} \quad 24444.57 \text{ cf}$   
 $WQ_v$  required as a permanenet volume (20% of  $WQ_v$ ) =  $0.28059 \text{ ac ft} \quad 4888.91 \text{ cf}$   
 $WQ_v$  provided as a permanent volume @ elevation 518.40 =

**WATER QUALITY COMPUTATIONS**

GOAL: Water quality for this development would be addressed structurally.

Data:

Total Project Site Area (DA-IM) = = 11.5150 ac = 501,593 s.f.

$A_{i_{ex}}$  = Total Existing Impervious Area = = 0.0000 ac = 0,000 s.f.

Existing Impervious Area which is Anticipated to be Disturbed under development including R/W Improvements = = 0.0000 ac = 0,000 s.f.

$A_{i_{pp}}$  = Impervious Area under Redevelopment = = 4.1830 ac = 182,211 s.f.

Liabile Impervious Area for Water Quality = = 4.1830 ac = 182,211 s.f.

Drainage Area Contributing to the Facility = = 11.5150 ac = 501,593 s.f.

I = percent Impervious Area =  $( \frac{A_i}{A} ) ( 100 ) =$   
 I = percent Impervious Area =  $( \frac{4.1830 \text{ ac.}}{11.5150 \text{ ac}} ) ( 100 ) = 36.33 \%$

$R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + ( \frac{0.009}{100} ) I ) =$   
 $R_v$  = Volumetric Runoff Coeff. =  $( 0.05 + ( \frac{0.009}{100} ) 36.33 ) = 0.38$  (from design manual, page 2.2)

P = Precipitation Depth = 1.2 in. (From design manual, page 2.3)

**COMPUTE WATER QUALITY VOLUME REQUIRED:**

WQv = Water Quality Volume =  $[ ( P ) ( R_v ) ( A ) ] / 12$   
 WQv = Water Quality Volume =  $[ ( 1.2 \text{ in.} ) ( 0.377 ) ( 11.5150 \text{ ac} ) ] / 12 = 0.43405 \text{ ac ft} = 18907.00 \text{ cf}$   
 WQv required as a permanent volume (20% of WQv) = = 0.08681 ac ft = 3781,40 cf  
 WQv provided as a permanent volume @ elevation 490.70 =