

TIM BARN BREWERY
TOWN OF CHESTER, NY

DESIGN CALCULATIONS - BIORETENTION BASIN A

WATER QUALITY VOLUME CALCULATION

90% Precipitation (P) (in.)	1.4
Drainage Area (sf)	48,750
Impervious Area (sf)	23,520
Imperviousness (%)	48.2
R _v	0.48
Water Quality Depth (in.)	0.68
WQv = Required Water Quality Volume (cf)	2,754

PRETREATMENT MEASURES

Gravel diaphragm	yes
Mulch layer	yes

BIORETENTION CALCULATIONS

Surface elevation (ft.)	549.0
Spillway elevation (ft.)	549.50
Available filter head (ft.)	0.50
Depth of filter media (ft.)	3.00
Depth of topsoil / mulch (ft.)	0.25
Filter fabric elevation (ft.)	545.8
Depth of stone (ft.)	0.75
Bottom of stone elevation (ft.)	545.0
Filter Media "k"	0.5
Tf = Time to drain (days)	2
Af = Required filter area (sf)	2,361
Proposed filter area (sf)	2,650

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DESIGN CALCULATIONS - BIORETENTION BASIN B

WATER QUALITY VOLUME CALCULATION

90% Precipitation (P) (in.)	1.4
Drainage Area (sf)	43,850
Impervious Area (sf)	13,120
Imperviousness (%)	29.9
R _v	0.32
Water Quality Depth (in.)	0.45
WQv = Required Water Quality Volume (cf)	1,633

PRETREATMENT MEASURES

Gravel diaphragm	yes
Mulch layer	yes

BIORETENTION CALCULATIONS

Surface elevation (ft.)	540.0
Spillway elevation (ft.)	540.50
Available filter head (ft.)	0.50
Depth of filter media (ft.)	3.00
Depth of topsoil / mulch (ft.)	0.25
Filter fabric elevation (ft.)	536.8
Depth of stone (ft.)	0.75
Bottom of stone elevation (ft.)	536.0
Filter Media "k"	0.5
T _f = Time to drain (days)	2
A_f = Required filter area (sf)	1,400
Proposed filter area (sf)	1,620

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DESIGN CALCULATIONS - BIORETENTION BASIN C

WATER QUALITY VOLUME CALCULATION

90% Precipitation (P) (in.)	1.4
Drainage Area (sf)	5,660
Impervious Area (sf)	1,740
Imperviousness (%)	30.7
R _v	0.33
Water Quality Depth (in.)	0.46
WQv = Required Water Quality Volume (cf)	216

PRETREATMENT MEASURES

Gravel diaphragm	yes
Mulch layer	yes

BIORETENTION CALCULATIONS

Surface elevation (ft.)	539.0
Spillway elevation (ft.)	539.50
Available filter head (ft.)	0.50
Depth of filter media (ft.)	3.00
Depth of topsoil / mulch (ft.)	0.25
Filter fabric elevation (ft.)	535.8
Depth of stone (ft.)	0.75
Bottom of stone elevation (ft.)	535.0
Filter Media "k"	0.5
T _f = Time to drain (days)	2
A_f = Required filter area (sf)	185
Proposed filter area (sf)	650