BMP Storage Capacity Calculations and Definitions

Use the table below to help determine which BMP you the Storage capacity (i.e. design storage volume, DSV) taken from Lake Champlain BMP Accounting and Tracking Tool (LC BATT).

Stormwater Control Type	**Description**	**Applicable Performance Curve**	**Method for calculating Design Storage Capacity**
Infiltration Trench	Provides storage of runoff using the void spaces within the soil/sand/gravel mixture within the trench for infiltration into the surrounding soils.	Infiltration Trench	DSV = void space volumes of stone and sand layers $DSV = (A_{trench} \times D_{stone} \times n_{stone}) + (A_{trench} \times D_{sand} \times n_{sand})$
Subsurface Infiltration	Provides storage of runoff using the combination of storage structures and void spaces within the washed stone within the system for infiltration into the surrounding soils.	Infiltration Trench	DSV = storage volume of storage units and void space of backfill materials. Example for subsurface galleys backfilled with washed stone: $DSV = (L \times W \times D)_{galley} + (A_{backfill} \times D_{stone} \times n_{stone})$
Surface Infiltration	Provides storage of runoff through surface ponding (e.g., basin or swale) for subsequent infiltration into the underlying soils.	Infiltration Basin	DSV = volume of storage structure before bypass. Example for linear trapezoidal vegetated swale. $DSV = (L \times ((W_{bottom} + W_{top@Dmax})/2) \times D)$
Rain Garden/Bio-retention (no underdrains)	Provides storage of runoff through surface ponding and possibly void spaces within the soil/sand/washed stone mixture that is used to filter runoff prior to infiltration into underlying soils.	Infiltration Basin	DSV = Ponding water storage volume and void space volumes of soil filter media. Example for raingarden : $DSV = (A_{pond} \times D_{pond}) + (A_{soil} \times D_{soil} \times n_{soil\ mix})$

Bioretention (w/underdrain)	Provides storage of runoff by filtering through an engineered soil media. The storage capacity includes void spaces in the filter media and temporary ponding at the surface. After runoff passes through the filter media it discharges through an under-drain pipe.	Bioretention	DSV = Ponding water storage volume and void space volume of soil filter media. $DSV = (A_{bed} \times D_{ponding}) + (A_{bed} \times D_{soil} \times n_{soil})$
Gravel Wetland	Provides surface storage of runoff in a wetland cell that is routed to an underlying saturated gravel internal storage reservoir (ISR). Outflow is controlled by an orifice that has its invert elevation equal to the top of the ISR layer and provides retention of at least 24 hours.	Gravel Wetland	DSV = pretreatment volume + ponding volume + void space volume of gravel ISR. $DSV = (A_{pretreatment} \times D_{Pretreatment}) + (A_{wetland} \times D_{ponding}) + (A_{ISR} \times D_{gravel} \times n_{gravel})$
Porous Pavement with subsurface infiltration	Provides filtering of runoff through a filter course and temporary storage of runoff within the void spaces of a subsurface gravel reservoir prior to infiltration into subsoils.	Infiltration Trench	DSV = void space volumes of gravel layer $DSV = (A_{pavement} \times D_{stone} \times n_{stone})$
Porous pavement w/ impermeable underlining or underdrain	Provides filtering of runoff through a filter course and temporary storage of runoff within the void spaces prior to discharge by way of an underdrain.	Porous Pavement	Depth of Filter Course = D_{FC}
Sand Filter w/underdrain	Provides filtering of runoff through a sand filter course and temporary storage of runoff through surface ponding and within void spaces of the sand and washed stone layers prior to discharge by way of an underdrain.	Sand Filter	DSV = pretreatment volume + ponding volume + void space volume of sand and washed stone layers. $DSV = (A_{pretreatment} \times D_{preTreatment}) + (A_{bed} \times D_{ponding}) + (A_{bed} \times D_{sand} \times n_{sand}) + (A_{bed} \times D_{stone} \times n_{stone})$
Wet Pond	Provides treatment of runoff through routing through permanent pool.	Wet Pond	DSV= Permanent pool volume prior to high flow bypass $DSV=A_{pond} \times D_{pond}$ (does not include pretreatment volume)
Extended Dry Detention Basin	Provides temporary detention storage for the design storage volume to drain in 24 hours through mutliple out let controls.	Dry Pond	DSV= Ponding volume prior to high flow bypass $DSV=A_{pond} \times D_{pond}$ (does not include pretreatment volume)

Grass Conveyance Swale	Conveys runoff through an open channel vegetated with grass. Primary removal mechanism is infiltration.	Grass Swale	DSV = Volume of swale at full design flow $DSV=L_{swale} x\ A_{crossect.\ swale}$
Footnotes:			
DSV= Design Storage Volume = physical storage capacity to hold water			
VSV=Void Space Volume			
L= length, W= width, D= depth at design capacity before bypass, n=porosity fill material, A= average surface area for calculating volume			
Infiltration rate = saturated soil hydraulic conductivity			