

**Table 6-1
Structural Stormwater Management Techniques
Chatham Run Watershed**

Description	Applicability	Advantages	Disadvantages	Maintenance
VOLUME REDUCTION TECHNIQUES				
Drain runoff from impervious areas over pervious areas	Use in low density development areas outside principal drainageways. Do not use in natural or man made drainage-ways.	<ul style="list-style-type: none"> • Inexpensive to install and maintain • Promotes groundwater recharge • Promotes green space preservation 	<ul style="list-style-type: none"> • May degrade groundwater quality 	<ul style="list-style-type: none"> • Periodic inspections for sedimentation • Harvest vegetation and collect thatch
Infiltration-pits, trenches and dry wells	Use when soil permeability is below bottom of structure, and runoff is free of particulate matter	<ul style="list-style-type: none"> • Inexpensive to construct • Provides groundwater recharge • Reduces pipe capacities and costs when used in conjunction with storm sewer bedding • Reduces ponding and local flooding • Multi-purpose use • Effective for controlling “first flush” pollutants 	<ul style="list-style-type: none"> • Requires sediment free runoff (otherwise filters may be required) • Limited to small applications • Clogged systems must be replaced • Must provide contingencies for ponding in a clogged or full system • Accelerates sinkhole production 	<ul style="list-style-type: none"> • Must clean and maintain sediment filters
Concrete grid and modular pavement	Use on large parking areas and on-street parking. Use as erosion control devices in drainageways and at detention basin outfalls (must be protected from undermining)	<ul style="list-style-type: none"> • Increased flexibility eases repair of underground utilities, replacement of pavement units, and installation of signs and plantings • Flexibility prevents buckling • Aesthetically pleasing 	<ul style="list-style-type: none"> • Installation expensive and labor intensive • Susceptible to damage from fertilizers and de-icing agents • Shifting units result in uneven surface and present a safety hazard • Potential groundwater quality degradation 	<ul style="list-style-type: none"> • Maintain vegetation in voids • Reset shifted units and replace broken units

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Porous asphalt pavement	Use in low volume traffic areas not subjected to heavy loads or the turning or stopping action of large vehicles. Requires a permeable soil sub-base	<ul style="list-style-type: none"> • Reduces or eliminates additional storage facilities • Water free surfaces enhance skid resistance • Eliminates need for crowns and cross slopes • Increases groundwater recharge 	<ul style="list-style-type: none"> • Asphalt cement prone to stripping by de-icing agents • Prone to clogging problems • Susceptible to freeze/thaw damage if adequate subsurface drainage is not provided • Increased aggregate base or asphalt thickness required • More expensive than conventional pavement • Conveys oils and solvents to groundwater • Weeds may grow through pavement 	<ul style="list-style-type: none"> • Remove debris and sediment from surface
Grassed waterways, filter strips, and seepage areas	Use in small developments with open space for stormwater control and along roadside drainage systems	<ul style="list-style-type: none"> • Less expensive than curbs and gutters • Enhances groundwater recharge • Eliminates flooding of roadways from inlet by-passing • Multi-purpose recreational use • Plantings in filter strips effectively screens parking areas • Positive aesthetics, increases time of concentration, and enhances infiltration 	<ul style="list-style-type: none"> • Requires more regular maintenance than curb and gutter systems • Requires wider right-of-ways • Driveway culverts trap debris • May require guide rails along roadway • May not be compatible with local subdivision • Receptacle for lawn debris • Sedimentation discourages vegetative growth • Seepage areas accumulate contaminants in upper layers of soil • Overflows from seepage areas may damage downstream areas • May accelerate sinkhole production 	<ul style="list-style-type: none"> • Remove obstructions along drainageways & repair erosion & sedimentation damage • Maintain vegetation & remove dead material • Maintain soil permeability to eliminate insect breeding problems

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Peak Reduction Techniques				
Detention basins	Use in practically any situation	<ul style="list-style-type: none"> • Provides local & watershed-wide stormwater control • Enhances sediment and debris control • Ease of constructability • Considerable design flexibility • May enhance groundwater recharge • May reduce downstream erosion problems • Effective for controlling “first flush” pollutants • Multi-purpose use 	<ul style="list-style-type: none"> • Converts sheet flow to point discharges • May promote sinkhole development in Karst terrain • Shallow sloped bottoms discourages vegetative growth • Standing water is a safety concern • Reduces amount of salable land • Undersized outlets collect debris • Concentrates pollutants in the soil 	<ul style="list-style-type: none"> • Maintenance access must be provided • Remove debris • Fill localized depressions to eliminate insect breeding • Maintain earthwork to prevent piping around outlet structure & erosion on spillway • Maintain veg.
Oversized conveyance system storage	Use anywhere storm sewers can be installed	<ul style="list-style-type: none"> • Does not use valuable land space • Minimal maintenance needs 	<ul style="list-style-type: none"> • Sediment accumulation must be flushed from the system • Constrictions in on-line systems may trap debris in inaccessible locations • Additional cost of oversized storm sewer and constricted outlets 	<ul style="list-style-type: none"> • Periodic inspection and cleaning of storm sewers
Parking lot storage	Use wherever large paved lots can be used to temporarily store runoff without causing safety concerns or inconvenience	<ul style="list-style-type: none"> • Easily incorporated into parking lot grading • Reduces downstream storage requirements 	<ul style="list-style-type: none"> • Can cause inconvenience • Requires significant slope on parking area to limit spread of water • May cause hazardous conditions in winter weather 	<ul style="list-style-type: none"> • Remove debris at outlet • Must keep parking lots clean

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Rooftop detention	Use on large flat roofs in highly urbanized settings	<ul style="list-style-type: none"> Requires no additional land space Poses no safety hazard or inconvenience to general public Stored water can be used for landscape maintenance May significantly impact local runoff problems 	<ul style="list-style-type: none"> Failure generally leads to on-site property damage Not well suited to retrofitting Little impact on watershed-wide runoff control May require modification to local building codes May not receive regular inspection and maintenance Results in higher roof loadings 	<ul style="list-style-type: none"> Routine leak detection inspections Downspouts must be kept free of debris
Cistern storage	Use anywhere construction costs are not prohibitive	<ul style="list-style-type: none"> Cisterns are unobtrusive Can easily be fit into existing sites Provides a free source of non-potable water Sumps are well suited for residential roof drainage Effective for controlling “first flush” pollutants 	<ul style="list-style-type: none"> Difficult to clear accumulated debris Difficult to drain, may require pump Requires large volume if no outlet is provided Susceptible to deterioration, expensive and difficult to maintain 	<ul style="list-style-type: none"> Regular inspection and debris removal

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Other Peak Reduction Techniques with Limited Potential				
Gravel parking lots & driveways	Use in long term parking areas and on very small lots	<ul style="list-style-type: none"> • Reduces runoff • Reduces construction costs 	<ul style="list-style-type: none"> • Runoff fraction increases as gravel consolidates • Mud can become a major problem • Susceptible to pothole development • Material may be removed during large storm events 	<ul style="list-style-type: none"> • Fill potholes • Excavate soft spots and muddy areas, and replace with new, clean aggregate
Rooftop gardens	Use wherever adequate space is available	<ul style="list-style-type: none"> • Provides free source of non-potable water 	<ul style="list-style-type: none"> • Extremely limited effect on local and watershed-wide runoff control 	<ul style="list-style-type: none"> • Not available