



## **Storm Water Management and Construction Protocol**

### **A. Pre-construction (Platforming and leveling the site):**

- 1) During this stage it is still too early to install the 'during construction/temporary storm water controls'. This is however an important period to have some form of controls in place. There are generally large open banks and loose fill material for indefinite periods of time.
- 2) Prior to any machine moving on site the following items must be done:
  - A) 80% Shade cloth fencing must be erected
  - B) 3 Rows of silt- fencing (see Storm Water Control details: spec # 1)
  - C) Identification of wetlands or other environmentally sensitive areas and the immediate inception of additional controls where necessary (i.e. additional rows of silt fencing).
- 4) As soon as the fencing has been erected, the builder is to install all sandbagging and other controls (i.e. silt fencing, strip sodding, earthberms, etc) required "During Construction"- these must be substantial, in order to control all storm water on the site and controls must be put in place to control run-off before it leaves the confinement of the shade cloth fence.
- 5) The 1<sup>st</sup> 3 inches of top soil is to be skimmed and stored as a wind-row/ earth berm at the full lower extreme of the property. This is to be constructed at a height of 1m and width of 2m. This soil must be re-used at the landscaping phase in order to provide adequate soil conditions for planting.
- 6) All banks must be finalized immediately after the platform has been incepted and grassed with strip sods (sod placement no more than 500mm apart on the full extent of banks), immediately following the finalization.

### **B. During Construction (Temporary/ whilst the building is under way)**

- 1) All controls must be incepted according to the "During Construction Storm Water Management Plan" approved by S.E.E.H.O.A.
- 2) Where necessary and/or under instruction from S.E.E.H.O.A., additional controls are needed- these must be incepted immediately
- 3) All silt traps, berms, agricultural trenches, drains, roads, etc must be maintained immediately after any damage is done (within 24 hours).
- 4) All storm water channeled off the site must be directed in such a manner as not to cause damage to common/ neighbouring grounds.
- 5) It is advisable at this stage to incept all possible permanent storm water systems a.s.a.p. Any storm water directed into this system at this stage in the development must have controls in place to trap any sediment from getting into the storm water system. This can be achieved by forcing water through a succession of silt catches, eg. Silt fences. All precaution must be taken to ensure sediment/ run-off does not end up in estate common ground, neighbouring properties, dams, ponds, or wetlands
- 6) Where permanent storm water systems are in use at this stage, water must first be channeled through a succession (2/3) of silt traps/fences. Please remember all mud flowing into these systems will end up in our wetlands, dams or ponds.
- 7) At the end of each working day the access route onto the site must be protected by sandbagging, to prevent the flow of storm water and silt onto or off the site. The perimeter gate must also be closed and secured.

### **C.) Permanent Storm Water Controls (post building Completion)**

- 1) This must be in compliance to the Approved Engineers Storm Water Management Plan for permanent Storm Water Management.

## Storm Water Controls-Specs

- 1) Control : **Silt Fencing**
- Installation : -The fence must be a total of at least 450mm in height (300mm above ground, 150mm buried- to decrease the risk of undermining)  
- These must be erected as a three-row sieving method- each row of fencing must be at most 1.5m apart.  
- Poles at 1m intervals are to be tied to the fence in order to keep it upright  
- All care must be taken to ensure that silt movement does not run around this fence- wing walls of this fence must be created, alternatively sandbags wing walls (see #5) may be used to control and attenuate the water through the silt fence.
- Uses : -Trap sediment whilst in movement  
-To break the force of the water movement and decrease its weight
- Composition : Bidem, 80% Shade cloth, Grass Mat ®
- Management : These must be cleaned of sediment and checked for damages regularly. An excessive build-up of silt against this fence will force too much weight upon it and cause it to collapse. Additionally, weak points or damages will allow silt to flow through without being sieved, and thus render the control obsolete.
- 2) Control : **Instant Lawn**
- Installation : This can be used as either full instant lawn or strip sods. Instant lawn can be costly and unless stipulated on the Final Landscape Plan, cannot be used as a permanent planting solution. Strip sods must be placed at most 500mm apart in order for this to be effective. These must be pegged if used on steep embankments and require soil preparation (i.e. compost) and frequent watering in order to grow.
- Uses : For use on steep banks- used in conjunction with the final landscape planting, will decrease the risk of sheet movement on steep banks.
- Composition : Must be a S.E.E.H.O.A Approved Grass.
- Management : Requires lots of water. Soil displacement over grass sods will result in the grass dying- ensure adequate controls above this method are in place.
- 3) Control : **Poles (Banks)**
- Installation : - Placed in a herringbone order  
- Must be pegged to hold the poles in position  
- A soil Berm must be created and mildly compacted above the pole set-up in order to decrease the risk of undermining.
- Uses : To slow down run-off, to decrease/ minimize the risk of sheet movement
- Composition : Various (Gum poles, wattle, bamboo, etc)
- Management : These must be checked to see that they are stable- may become dangerous if large logs roll. Soil berms must be checked and repaired after rains

- 4) Control : **Drainage Pipes**
- Installation :   
 - Used in conjunction with sandbagging (see #5) or earthberms (see #6)  
 - Placed from the top of a platform at the low/weak point  
 - Pipe to run down the bank to a flat area or into the storm water system  
 - A break pressure wall or pipe, sandbag wall (herringbone formation) is to be erected so as to break the velocity of the water movement. Ideally the pipe should release water in a sheet flow and with as little velocity as possible.  
 - Silt fencing must be placed in three rows (see #1), in order to sieve any sediment.  
 - All water on platforms must be directed to the pipe by means of trenching or sandbags- unless placed at low point. Sandbags must be placed as a 'wall' structure in order to create a physical barrier to direct the water to the outfall pipe.
- Uses :   
 - To alleviate the hazard of water ponding  
 - To minimize the risk of berms breaking and damages as a result of ponding.  
 - To attenuate and control storm water away from workable areas
- Composition : P.V.C. piping (various sizes- min 175mm), Shade cloth fence (min 80%), Sandbags or earthberms,  
 Management : Ongoing management of sandbags, fencing and pipes, checks for blockages in the pipe that will render this control obsolete.
- 5) Control : **Sandbagging**
- Installation :   
 - Must be used as a means of walling and attenuating water only  
 - Must be placed in brick formation side by side, and then the second row placed against the first for added strength.  
 - Must not be used to pond water on large areas
- Uses : For attenuating water in the movement towards drainage pipes and permanent storm water systems. Also for the use of breaking pressure and can be used to slow down sheet movement on banks if placed in herringbone fashion.
- Composition : Plastic, Hessian, nylon bags
- Management : Cleaning/removing silt build-up regularly, replacement of damaged bags- plastic preferred- less likely to become damaged and longer lasting
- 6) Control : **Earth-berms**
- Installation :   
 - These must be constructed at least 1m in width and at least 750mm in height  
 - All earth-berms must be compacted  
 - These must be placed at least 1m away from the edge of an embankment
- Uses :   
 - Attenuating water to outfall pipes or into the permanent storm water system only  
 - This is not a means for damming water- ponding water can become very destructive
- Composition : Soil- compacted
- Management : Cleaning/removing silt build-up regularly- re-establishment of damaged berms

- 7) Control : **Small Trenches with Small Earth-berms**
- Installation : - These can be created horizontally across the sheet movement of water  
 - Trenches are to be dug a minimum depth of 300 mm, be at least 300mm wide and must be created the full length across the effected area.  
 - The berm must be placed on the down side to create further height and must be compacted
- Uses : Small trenches with small earth-berms on the down side/slope can be useful for slowing down sheet movement on semi-flat areas and catching soil in the trenches.
- Composition : Soil only
- Management : Any dropped sediment in the trenches must be removed within 24 hours of damage done re-establishment of damaged berms
- 8) Control : **Agricultural Trenches**
- Installation : These must be cut back into the angle of the slope and have a fall of at least 20 degrees. They must be constructed at least 1.2m wide and be used in conjunction with other forms of controls (i.e. silt fencing, catch pits, etc) in order to slow down the rate of force and deposit soil at intervals. Silt fences must be erected in these trenches at maximum intervals of every 5m. Berms on the down slope must be compacted and they should be at least 450 mm wide and 300 mm high. Agricultural Trenches should be constructed around the full perimeter of the site or wherever water attenuation is required. It must be constructed in such a way as to allow water to move to an area where the water (less the soil) will be managed by the estate (i.e. dams, ponds, catch pits, etc).
- Uses : Predominantly for use on larger projects. Only for attenuation purposes- ponding in these trenches may cause more damage if the berms were to break.
- Composition : Trenching and small berms
- Management : Continual management is required- trenches must be cleared of sediment within 24 hours of every rainfall. Clogging and silt build up will lead to ponding and restrict the flow of the water.

All storm water control plans must have details pertaining to the pre, during and post construction management of storm water on site. All specifications must be noted in detail and sketch form. The implementation and the ongoing management of these controls will be monitored by S.E.E.H.O.A.

All storm water control detail is to be endorsed by the site engineer. The above details and specifications are an added control mechanism to be included along with other control means, S.E.E.H.O.A. accepts no responsibility for failure of controls or any damages or injuries incurred on site as a result of failed control mechanisms.