TRASH SCREENS
DESIGN AND OPERATIONS MANUAL
APPENDIX E

RISK ASSESSMENT INFORMATION

CULVERT BLOCKAGE

Probability

History of Blockage	Directly related to the probability of blockage, care should be taken to assess any changes over to time to the catchment, the culvert and all those factors that would render the blockage history unreliable.
Culvert Size	There is a relationship between the culvert size and debris size that impacts on the probability of the debris becoming stuck in the culvert. The designer will have to make an assessment of this probability. The blockage probability is in addition affected by the general nature of the debris and if a single piece of debris has the ability to accumulate subsequent arriving debris and hence leading to a blockage
Catchment type	The catchment type provides an indicator as to the type of debris likely to arrive at the culvert. The designer should assess the catchment for debris type paying particular attention to the materials in the immediate vacinity of the watercourse and areas likely to be brought into the flow path during bank full conditions. The designer should also be aware of any fly tipping the area.. Items likely to cause blockage include tree stumps large branches, scaffold poles any debris with a dimension greater than the culverts minimum dimensional property.
Culvert Details	Full dimensional properties of the culvert should be ascertained. Particular attention should be paid to changes in alignment and obstructions
Upstream access	Access to the watercourse u/s of the culvert entrance has two impacts on the probability of blockage. Firstly there is the possibility that easy access encourages fly tipping into the watercourse and conversely easy access allows the operator to remove debris. The designer must balance these two impacts in assessing the overall risk.

CULVERT BLOCKAGE

Consequence

Flooded Area	Calculation of the likely flooded area resulting form the blockage enables a direct assessment, where appropriate of damages due to flooding to be made , this assessment should utilise the work of MAFF PAGN and Middlesex Polytechnic
Culvert Construction	This is an important factor in evaluating the work necessary to remove the blockage from the culvert and hence the cost of such an exercise.
Depth of Culvert	Has an impact on the ability to relieve the culvert blockage, i.e. excavation depth should this method of recovery be required.
Over culvert construction	Has a bearing on the method of unblocking the culvert, and hence cost of such an exercise. If the over culvert area is open field then excavation down to the culvert is relatively straight forward against the scenario where there is expensive office space above ground.
Historic information	Will allow some accuracy to be gained form knowledge of actual flood areas and property affected. It allows assessment of possible third party claims and those areas that are not obviously prone to the affects of flooding.

UNAUTHORISED ENTRY TO CULVERT

Probability

History of Entry	Provides information on those groups likely to access the culvert and the frequency of access. It should be noted that the demography of an area change and this factor must be considered as verification for use of historical data.
Nature of surrounding area	Provides data on the demography of the area, note above. If there are large housing estates, schools, playing fields etc these all add to the risk of children entering the culvert. If the immediate surroundings are a well-known play area then the risk is likely to be high. If there is a secure area/compound to the culvert then entry will be less likely.
Culvert Size	Will provide a physical limit to the likelihood of entry

UNAUTHORISED ENTRY TO CULVERT

Consequence

Size of culvert	If the culvert size changes through its length especially reducing, then the likelihood of being trapped and injured is high.
Nature of flow	In a flashy catchment there is more likelihood of someone being washed into the culvert.
Obstructions/ dropshafts within the culvert	Obstructions within the culvert will cause injury to anyone being washed into the culvert and to those entering a culvert of their own volition
Nature of obstruction/ dropshaft	Will have a direct influence of the nature of injury to any one entering the culvert
Length of culvert	The longer the culvert the more serious will be the injury to anyone washed into the culvert

DAMAGE CAUSED TO CULVERT INFRASTRUCTURE BY DEBRIS

Probability

Nature of debris	The larger and more rigid any single piece of debris the greater the probability of damage
Catchment characteristics	Flashy catchments tend to produce a greater number of non routine events
Culvert construction	GRP lined culverts or those of brickwork of a substantial age may easily be damaged. Culvert of timber construction can be especially prone to damage
Services exposed within culvert	Services protruding into the general flow area are particularly vulnerable to damage.
Age and condition of culvert	The susceptibility to damage will be influenced by the age and condition of the structure.

DAMAGE CAUSED TO CULVERT INFRASTRUCTURE BY DEBRIS

Consequence

Severity of damage to structure	Cost of repair, temporary works and disruption
Severity of damage to services	Cost of repair, temporary works and disruption. Third party claims.