MOLONEY

ASSET MANAGEMENT SYSTEM

MANUAL OF OPERATIONS

COVERING THE

Storm Water Module

(Storm Water. xls)

July 2001

TABLE OF CONTENTS

5   The Master Sheet - Layout

5.1.   Data Collection:

5.2   Preliminary Work:

5.3   The Data Collection Sheet & Data input format:

5.4   Master Sheet details Column by Column:

LIST OF FIGURES

1   INTRODUCTION

The Underground drainage module is a single file Asset Module. All Data entry and reports are contained within the single Excel file Called the **UGDRAIN4. Xls** File. The aim of the Module is to provide an easy to use method of recording details relating to underground drainage assets and to rearrange the input data into a number of basic reports.

The philosophy behind the Underground drainage module is similar to that of other asset Modules. The physical characteristics of the individual asset components are entered onto the "Master Sheet" together with Descriptions, Codes and Values for each of the Sub Assets that are to be used. Asset valuations are generated directly on the "Master Sheet" while a series of "Visual Basic Programs deliver other asset reports.

There is capacity to record a range of information not all of which is used by the current program. However, the information has been included as a means of recording the data for later use and reference. Remember that any additional specific reports that you require can be programmed in at a later date or simply generated manually as required.

There is a great scope for further reports to be generated within the program given the extent of the data acquisition that is allowed for. Much of the data acquisition is optional and will not be used by all Councils. However even if all that is done initially is to collate and store as much data as is readily available within the Program it will become a very useful reference point for future drainage queries. The program will also continue to be developed to meet the needs of its user organisations.

As with all modules you may alter to suite your own needs the outcome of any of the reports. You may Cut, Paste, Delete or Add to any of the reports knowing that they can all be generated again from the "Master Sheet". Alterations to the Structure of the "**Master Sheet**" and the "**Codes**" Sheet should not be undertaken as this may cause problems with the running of other reports.

2.0   THE BASIC FILE SET UP

The File consists of 11 sheets and a series of 62 visual basic programs. A brief description of the 11 Sheets is detailed below. Each of the Sheets will be dealt with in detail at a later stage.

2.1   NOTES ON FILE SHEET

This sheet contains a very brief explanation of the operation of the file and is designed to provide enough information to enable users to commence operations without reference to this manual.

2.2   MASTER SHEET

This sheet is the heart of the Module. All of the base data relating to the underground drainage assets is stored within this sheet. Data entry is undertaken directly onto this sheet with the only other data required for program functioning being the Asset Code details which are entered onto the CODES Sheet.

Care should always be taken when manipulating data on the MASTER Sheet as this sheet represents the ongoing record of all of your data.

2.3   CODES Sheet

The costing of assets depends upon the unit values and life cycles allocated within this sheet. Changes made to the values within this sheet will only be transferred to the other reports once those reports have been run.

2.4   VALUATION Sheet

The information contained within this report is also contained on the MASTER Sheet. The purpose of the report sheet is to provide a convenient format for the printing out of the asset valuation data in an A4 Format. The Valuation Sheet also has a number of built in Data Sort options which are accessed from the **"UG-DRAIN 4"** Menu Bar.

2.5   PIT COND Sheet

The Pit Condition Sheet assembles all data relating to the Pits from the MASTER Sheet and rearranges it for various pit-related reports. There is also the facility to resort this data into a number of condition priority orders.

2.6   PIPE COND Sheet

The pipe condition report sheet as with the pit condition sheet above assembles all data relating to the pipe assets from the MASTER Sheet and sorts it into condition order. There is also the capacity to resort this data into other priority orders.

2.7   PIT MAINTENANCE Sheet

Within columns Z – AB on the master sheet details may be recorded relating to any pit maintenance that may have been identified. This Sheet is designed to collate that information into a consolidated report dealing with all proposed pit maintenance works. Note that only rows of data where a pit has been listed for maintenance on the Master Sheet will be transferred to this report sheet.

2.8   EXISTING CONDITION Sheet

This is the first of 3 sheets that act together to provide a means of modelling the future capital demand of the asset group. This first sheet stores the overall asset condition spread for both the pit and pipe assets. There are 4 graphs on the sheet representing the condition spread of both the pit and pipe assets.

2.9   PREDICTED CONDITION Sheet

This second sheet in the financial modelling section allows you to predict the future asset condition based upon the proposed level of annual capital expenditure over a 50-year horizon.

2.10   Predicted Capital Requirement Sheet

This is the final sheet in the financial modelling group. This sheet models the required expenditure necessary to maintain the assets within a selected upper condition range.

2.11   DATA COLL. Sheet

This sheet is a blank form that can be copied and used for data capture. You may choose to modify the sheet or to use it as is.

3   FILE LOCATION & SETUP

The location of this single file is not linked to the location of any other files. However it is recommended that the file be located within a drainage directory under an assets directory. This will allow for the use of an overall program that gathers asset Valuation figures from various locations and assembles a single capital financial report

4   ASSET CODES - Codes Sheet

The program requires a minimum of three types of codes to be input into the **Codes** Sheet. The three essential codes are the first three Codes detailed below. The other Four Codes are optional at this stage and are provided more as a means of storing information about the Assets.

4.1   PIT CODES - Used in Column M of UD Master Sheet

These are unique codes to describe each different type of pit that you intend to use as a separate entity within the program. You are required to describe the pit, give it a unique identifying code then assign a unit value to the Pit as well as an expected life in years. There are some samples within the program supplied for example a C4/1C is the code adopted for a 450 x 450 Concrete junction Pit with a Concrete Lid. The cost of this configuration being set at $200 and the expected life at 40 years.

You need to develop your own set of unique pit codes that best serve your needs.

4.2   PIPE CODES   - Used in Column AM of Master Sheet

Codes are required for the supply only of a pipe. You can adopt up to 600 individual Pipe codes and place them within the Code block on the **CODE** Sheet. The First code that currently exists within the code block is a 2P225 which relates to a Class 2 reinforced concrete pipe of 225 mm diameter. Purchase price per metre is adopted at $18.00 and the expected life of the Pipe is 100 years. You could adopt different codes for the supply of the same pipe in different exposure conditions. For Example the replacement cost per metre would be the same but the expected life would vary and hence so would the Depreciation.

4.3   PIPE CONSTRUCTION CODES - Used in Column AN of Master Sheet

In order to cater for the different types of Pipe construction conditions a pipe construction code has been adopted that links the cost of construction to the cost of the pipe. The more difficult the construction situation the higher the cost factor. The cost of construction is generated by multiplying the cost of the pipe by the construction factor. For example a code 1 construction factor is at the bottom end of difficulty and is described as open access with no rock and natural material backfill in shallow conditions. The cost of this operation being 0.8 of the cost of the Pipe. As the degree of difficulty associated with the construction of the pipe increases so does the pipe construction cost factor? A construction code 8B represents a pipe construction situation in confined space with Rock excavation, a selected backfill material and a deep excavation. Thus the Cost factor is high at 4 times the price of the pipe.

4.4   Codes for proposed pit maintenance   - Used in Column z of Master Sheet

While undertaking the assessment of the pit condition if the assessor determines that any maintenance work is needed on the pit within say the next 10 years then these details are recorded on the system. A code is used to describe the type of work required and a unit cost is placed against that code.

It may be that you need several codes for the same function with a differential cost structure depending upon the extent of the works required. For example a Code RL1 may represent the replacement of a basic 600 x 600 RC Pit lid at a Cost of $80 while a an RL3 Code may represent the replacement of a more expensive cast iron Pit lid at $400.

The use of this function within the program is optional and the program will function if no data is entered into the proposed pit maintenance area on the master sheet.

4.6   PIT LOCATION CODES – Column Y of Master Sheet :

These codes are recorded for information only at this stage. The purpose of the codes is to record the nature of the area in which the Pit is located. For example the pit may be within a sealed pavement or within an open grassed reserve. The codes for these locations would enable you to quickly ascertain the nature of the environment around the asset.

4.7   PIPE LOCATION CODES – Column BB of the Master Sheet

Detail as for Pits above.

4.8   Other Codes used on the Master Sheet

The proposed next pit and next pipe treatment codes within the master sheet are drawn from the same code block on the codes sheet as are the existing pit and pipe codes. It may be that an existing brick pit is planned to be replaced with a concrete pit. This facility will insure that the condition reports are costed with the proposed treatments rather than simply a repeat of the existing.

5   The Master Sheet - Layout

5.1.   Data Collection:

The Underground drainage asset group is perhaps the most difficult of the Infrastructure assets to pick up. To collect all of the data that is contained within the system will involve a great amount of fieldwork. If you intend to use the data that is collected to assist with the maintenance and management of the underground network then the money spent in collection of the data will be well worth while. If your initial aim is to simply identify the basic assets that are present then you will be able to shortcut a lot of the data collection. However you approach the task you would do well to think about the outcomes you desire from the system before you set up the data collection schedule.

The minimum data collection information for the functioning of the basic system is quite small. On the master sheet press "Ctrl H" and the hidden copy block that is used to add new lines of data will appear. On row 12 you will find the 11 fields that must be filled in highlighted in red. Note that some of the fields can be set as defaults on row 11 so that each time you add a new line the default data is entered.

5.2   Preliminary Work:

Before fieldwork commences it will be necessary to establish a few basic policies. The first decision to make is weather you intend to travel upstream or downstream along the drainage line. It is recommended that you commence downstream and then proceed upstream. Although the program will function in either direction.

You should then decide how you are going to record the location of each pit. There are two methods available. You can record the Co-ordinates of the pit in the space provided. This would generally be done via the use of a Global Positioning System (GPS). The advantage with this method is that provided you have access to CAD facilities you can generally produce a plan of the drainage network once all pit data has been collected.

The other method of Pit location is to rely upon a description of the location and this coupled with a plan of the system can provide a good reference to the location of a particular asset. The extent to which you will need to describe the Pit location will to a large degree depend upon the existing maps and pit numbering system that exists.

There are a number of other columns within the sheet that may be useful in assisting with the task of pit location. You may wish to use the "District or general Locality " Column or the Catchment ID Number to assist with location identification. You could alternatively use the "Asset No." Or the "G.I.S. No" Columns if these were not needed for their listed purpose. In addition to these columns there are several other Columns headed "OTHER" which can be used for any other purpose. These columns are all carried through to each report although they may be hidden from view, hey can be brought back into view very easily if desired.

5.3   The Data Collection Sheet & Data input format:

The data collection sheet has been designed to closely resemble the format of the Master Sheet. There are some columns missing from the data collection sheet. However, these contain data that would not generally be collected in the field and have been left off in order to keep the size of the data collection sheet down to a manageable size.

5.4 Master Sheet details Column by Column:

There are some 99 columns within the master sheet of the underground drainage module. Some must be populated in order for the program to function while others are provided as a means of recording data relating to the underground drainage system. Within this section we will look at the function of all of the column entries and those which must be filled in will be identified with an ** at the column heading.

A	B	C	D	E	F	G	H
Seg.	PIT FROM	PIT TO	General Pit Details	Second	Other	Other	Other
I.D.	Pit	Pit	Description of Pit Location	Pit Des.			
No.	I. D.	I. D.	The Pit To is the Pit	Detail			
	Details	Details	Being Assessed on this Line				

Figure No.1
Pit Location Details Column A - K

5.4.1 Column A - Segment ID No. ** (An Essential Entry)

This is the row or data segment No. it is used to identify the segment and is placed in automatically as a new segment is generated. The field must be a straight integer and can be amended after entry. The program can find the highest segment number and record this in cell I3 on the master sheet. This is done by sorting the master sheet with the automatic sort option from the drop down menu titled (5. Descending ID order)

Whenever the program needs to find the bottom of the data set it uses this field to establish the bottom of the data set assuming that there will always be an entry here.

5.4.2 Column B - Pit From: ** (An Essential Entry)

This column contains the Pit identification Number for the pit at the start of the segment of drain under consideration. You can adopt any identification code that you like but the most common is a form of Alpha - Numeric codes with the alpha parts identifying the drainage line and the numeric figures representing the pit number along the line. Alternatively a straight pit number is often used.

Only one pit is assessed per line and it can be the pit from or the pit to. It is recommended that the pit from be the one that is assessed while the pit to in column C is present for record purposes. Thus in a drainage line the pit to will become the pit from in the line below.

In a fully pitted drainage line there will be one more pit than there is pipe segments. The last segment of a drainage line within the program may have no entries for pipe details. The line will be present just to record the details of the final pit.

Within this field there must always be an entry. If no pit is present where a pipe terminates at a blank end then it is recommended that a pit number still be allocated. The pit numbers within this field may not be unique. There may be two or more drainage lines that start or end at the one pit. The costing of the pit in these cases will be dealt with when we come to the pit code section.

5.4.3   Column C   -   Pit To: **

As above this column records the identification number of the pit at which the drainage line under consideration terminates.

5.4.4   Column D   -   Description of Pit Location:

There are two ways in which the location of the pit can be identified. This one requires a description of the location and while not in itself being a complete positional identification may rely upon a map with the pit location plotted there upon to be used in conjunction with the description and the Pit ID Number. The description can take any form that you wish.

If you are supplying Co-Ordinates for the pit location then you may choose not to fill this column in.

5.4.5   Column E   -   Second Pit Description Detail:

This column allows you to supply a second detailed description relating to the pit. It is often used to identify pits that are duplicated within the system but it can be used for any purpose.

5.4.6   Column F - H   -   The first of several columns titled "Other":

All columns with the title "Other" within the master sheet have been reserved for user defined purposes and for the provision of unique information. They tend to be scattered throughout the sheet and you may rename the fields if required. Most are transported to the various reports so the additional data will be available within the various reports. Columns with the heading "Other" will not be dealt with again within this section of the manual.

In some instances Column H has been used as a pit from ID number. This is not always necessary, as the segment number in column A is unique to each pit from. However, because column A is used as the Microsoft access segment number it must be a fully numeric value and cannot be alpha – numeric this additional field will allow for alpha – numeric pit identifications.

Figure No.2
Pit Details Column I - L

5.4.7   Column I - L   Co-Ordinates:

The Co-Ordinates of both the pit from and the pit to can be stored here. If a GIS System is being used then the Co-Ordinates will be a key part of the data set.

Figure No.3
Pit Details Column M - Y

5.4.8   Column M   Pit Code: **

Here the Code of the Pit that is being assessed is recorded. Usually this will be the Pit From but it could be the Pit to. Whichever convention you adopt you must be consistent with throughout the database.

There are 590 possible pit codes that can be handled within the system. The codes themselves are recorded within the Codes sheet of the file and for each code recorded you must provide a description as well as a replacement value and an expected life. The scope of the pit code capacity is quite extensive and should be able to handle most situations that arise.

Codes are not limited to the type of pit only. For example you may have a pit with a code of C4/1C which represents a 450 x 450 mm concrete pit with a cast iron lid and a depth up to 1 metre. This pit being located in good non-aggressive ground. The same pit located within highly corrosive

ground may have a Code of C4/1C/A. The replacement value of the two pits may be the same but the expected life of the two pits and hence the depreciation would be very different.

There are two situations with pit codes that should be addressed here. The first is how to deal with a ground location where there could be a pit but none is present. Eg at the end of a drainage line discharging to a creek. In this case a "NP" code with a zero value is recommended to identify that no pit was present. The database may have a pit number for the location allocated in columns B or C but the "NP" code will handle that situation.

The second Pit code situation that requires some careful attention is when dealing with a duplicate pit. More than one drainage line may share the same pit and the pit ID number may appear more than once within the database. If it occurs within the pit to field it will be OK because this pit is not valued. If however it appears within the pit from field then a special code such as "DP" for duplicate pit needs to be inserted within the code field with a zero value to indicate that although the pit is associated with that line that the asset has already been valued separately.

5.4.9   Column N   Overall Pit Condition:

The overall pit condition is derived by formulae within the program. The default setting is to simply make the overall condition equal to the pit structural condition within column O. However the formulae that derives the value is housed within the hidden copy block in cell N11 and may be amended to suite.

The single variable has been adopted for simplicity on the basis that this may be the only variable that is either picked up or is available. You can amend the formulae to better reflect your needs. The Overall pit condition factor must end up with a possible range of 0 to 10 based upon the weighting that you adopt. It is this condition factor that is used to derive the valuation figures for the pits and to sort the pit condition sheet into overall pit condition order.

5.4.10   Column O   Pit Structural Condition: **

This is a very important condition factor it is currently the one factor used to calculate the present or written down value of the Pit. Each user will need to determine a scale that can be used to identify pit condition. From this pit condition factor modelling can be undertaken to predict the future financial requirements to maintain the pit network.

In many cases the only reliable data available in relation to pits is the data of construction. This can be used in conjunction with a sample survey to establish an expected age condition relationship for the whole network.

The physical inspection of the pits can be expensive and this work could be undertaken as part of the maintenance of the network. When assessing pits on a visual basis the following is offered as a general guide only. It is recommended that you develop your own condition criteria.

- **Condition 0 - 2**
  This condition range would be placed on a pit that was in very good condition with very little or no sign of concrete deterioration or other ware. It would be expected that pits under 10 years of age would be in this condition.

- **Condition 3 - 4**
  Pits within this range would be showing some signs of ware but not exhibiting any real structural problems. The age of the pits would be expected to be within the range 20 - 40 years.

- **Condition 5 - 6**
  Within this Condition range a pit is half way through it's useful life. There would be obvious signs of wear within the pit and perhaps some minor structural problems but the structural integrity of the pit would still be intact as it would be expected to have a life of 15 - 30 years in front of it.

- **Condition 7 - 8**
  At this condition rating there would be obvious signs of wear and or structural failure of the pit. With 70 - 80% of the pit life gone it would be expected that the pit would survive for a further 2 - 15 years.

- **Condition 9 - 10**
  A pit in condition 9 or 10 would be in very poor condition. It would be obvious that the pit was subject to extreme ware and or structural damage and was in need of replacement immediately. There would be no doubt about the condition assessment as the assessor would see the overall poor state of the pit and the immediate need to replace it.

5.4.11   Column P   Pit Lid Condition:

This condition factor while not necessary for the functioning of the program is still a very important piece of information to be recorded during inspection. The Pit Lid condition is used within the Pit Condition report to produce a listing of all pits in Lid Condition order. The potential danger to the public is the main reason for recording this condition factor

As a general guide the following descriptions are offered for the selection of Pit Lid Condition.

- **Condition 0 - 2**
  This condition range would be placed on a pit lid that was in very good condition with very little or no sign of deterioration or other wear. The Pit lid would be expected to have the majority of its life intact.

- **Condition 3 - 4**
  Pit Lids within this range would be showing some signs of wear but not exhibiting any real structural problems.

- **Condition 5 - 6**
  Within this Condition range the pit lid is half way through it's useful life. There would be obvious signs of wear on the lid and perhaps some minor structural problems but the structural integrity of the lid would still be intact.

- **Condition 7 - 8**
  At this condition rating there would be obvious signs of wear and or some structural failure of the lid. With 70 - 80% of the pit lid life gone it would be wise to schedule the pit lid for a further inspection in 6 to 12 months if it was not listed for replacement.

- **Condition 9 - 10**
  A pit lid in condition 9 or 10 would be in very poor condition. It would be obvious that the lid was subject to extreme ware and or structural damage and should be replaced immediately. Pit lids should not be allowed to deteriorate to a condition where they could present a danger to the public. Any lid that is considered by the assessor to be in any way dangerous would need to be within this condition range.

5.4.12   Column Q   Pit Clean out Condition:

Pits require to be cleaned from time to time. The proper maintenance of the pit system will greatly reduce the need to undertake the far more difficult and expensive function of Pipe Cleaning. The following is offered as a guide to the condition rating of Pit Clean out.

- **Condition 0 - 2**
  This condition range would be placed on a pit that was in very good and clean condition requiring no cleaning out.

- **Condition 3 - 4**
  Pits within this range would be showing some signs of debris build up but by no means excessive.

- **Condition 5 - 6**
  Within this Condition range pits would be in need of cleaning out to avoid the debris and silt flowing into the pipe and causing further problem.

- **Condition 7 - 8**
  At a condition rating of 7 - 8 it would be very obvious that the pit was in urgent need of attention. The work would need to be scheduled in the near future as in this condition the silt and debris would already be causing problems in the pipe.

- **Condition 9 - 10**
  A pit in condition 9 or 10 would have most if not the entire outlet pipe covered with silt and debris. The condition of the pit would be causing a severe restriction to the flow of water and work would be required urgently.

5.4.13 Column R Pit Step Condition:

Not all pits will have steps but those that do should be assessed for the general safety of the Pit Steps. The following guide to the condition rating of Pit steps is presented.

- **Condition 0 - 2**
  This condition range would be placed on steps that were in very good condition with no sign of wear or corrosion.

- **Condition 3 - 4**
  Steps within this range would be showing minimal signs of wear or corrosion up but by no means excessive.

- **Condition 5 - 6**
  Within this Condition range steps would be worn or corroded to a limited extent.

- **Condition 7 - 8**
  At a condition rating of 7 - 8 it would be obvious that the steps were worn and or corroded. The steps would need to be repaired or replaced within the next year or two and at condition 8 should be scheduled for immediate replacement or repair.

- **Condition 9 - 10**
  Steps in condition 9 or 10 would be dangerous to use and would need to be replaced immediately.

5.4.14 Column S Pit Dimensions:

This field and the adjacent "Other" field can be used alone or together to record the pit dimension details.

5.4.15 Column T - X Pit Levels etc.:

These five columns are provided to allow you to record certain engineering detail relating to the pit and pipes.

5.4.16 Column Y Pit Location Code.:

This code is used to provide a reference as to where the pit is located. The purpose of the Code is to allow a quick reference to pits that are located within difficult situations. For example pits located within a road pavement area may be designated with a RP code and those within the nature strip could be coded as NS. This data is also optional.

Z	AA	AB	AC	AD	AE	AF	AG	AH
Proposed Pit Maintenance			General Comments	Date of	Date	Prop Next Pit Capital Treatmt.		
Mtce.	Time	Urgent	Relating to the Pit	Pit	Const.	Type or Code	Prop Rep.	Urgent
Code	M/Y	0 - 10		Insp.	M/Y	of Treatment	M/Y	0 - 10

5.4.17   Column Z - AB   Proposed Pit Maintenance:

The program has the capacity to record any maintenance operations that need to be undertaken on the pits. This would be done during the inspection or as part of the routine maintenance cleaning or inspection of the pits.

There is a separate report sheet within the file called the "Pit Maintenance" sheet which copies the details of all proposed maintenance activities and then costs the works based upon the maintenance code. For example a CP1 may be a "clean pit" of basic size at a cost of $40.00. The assessor also has the ability to place a recommended time for the works as well as an urgency rating. The urgency rating has a scale of 0 – 10 with 0 having no urgency and 10 being desperately urgent.

5.4.18   Column AC   Pit General Comments:

Reserved for comments relating to the Pit generally.

5.4.19   Column AD   Date of pit inspection:

If the pits are physically inspected then the date should be recorded here. The recommended format here is for a month and year approach. This will allow you to check for activities within any one financial year and will also assist with the determination of the asset degradation rates if full condition assessments are made on a regular basis.

5.4.20   Column AE   Year of Pit Construction:

If this information is available it is a very useful exercise to place it within the database. The data here is optional but it is stressed that the information can be very useful. Often it will be the data of construction that is used to create a pit condition rather than undertake a physical inspection of every pit.

5.4.21   Column AF - AH   Proposed Next Treatment:

Like other Moloney asset programs this program allows you to value your assets in two ways. Firstly the code for the existing pit in column M is used for accounting valuations. However, the next capital treatment on the asset may not be the replacement of the asset in the same format. For example an old brick pit may be planned to be replaced with a concrete pit at a very different cost structure.

This facility allows you to amend the next treatment so that the pit condition sheen will reflect the cost of the proposed rehabilitation rather than the replacement of the existing pit. The proposed replacement date and urgency within columns AJ & AK are optional entries even when you are using the next replacement pit code.

The reference for the codes used here is in the same location as for the existing pit (Columns A – D on the Codes sheet). If the cell is blank the program assumes that the next treatment will be the same as the existing treatment. If there is a valid c ode present then the program sets up the pit condition sheet based upon the valuation of the proposed code.

The Code used within Column AE is capable of two functions. Firstly it can deliver a unit price for any designated work function. For Example the RL1 code could be used to represent the replacement of a minor pit lit at a unit cost of $80 while a RL3 Code could be the replacement of a substantial lid at a cost of $400. The Codes that you use are at your desecration as are the values assigned to them. The Codes and values are recorded within the UD Codes sheet.

The second option for costing is to place a **code RP** within the column. This instructs the program to place the replacement cost of the pit into the proposed works report. The idea of this is to avoid the need to have the pit codes duplicated within the Codes for next pit Treatment. Clearly the total replacement of the pit will be a works option at times.

Figure No.5
Pit Details Column AI - AL

5.4.22   Column AI - AK   Pit To Details
These three fields are provided to record the basic details for the pit to. This is the pit that will not be assessed on this line. To some extent the information is duplicated as it will also be present in the pit from area on another line. However, it has been found useful information when linking with other databases.

5.4.23   Column AL   ID of Pit Inspector

The inspection of the pits may well be undertaken as a regular maintenance activity apart from any inspection of the pipes. Thus provision has been made to record both the date and ID of the inspector of pits and pipes separately.

AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY
Pipe Details					Pipe Details							
Code or Type of Pipe	Pipe Const. Code	Length (m)	No of Cells	Tot Pipe Length	Overall Pipe Cond.	Struct. Cond. (0-10)	Alignmt Cond. (0-10)	Joint Cond (0-10)	Erosion Cond (0-10)	Clean Out Cond.	Other	Other

Figure No.6
Pipe Details Column AM - AY

5.4.24   Column AM   Pipe Code **:
There are 590 locations for possible Pipe Codes within the Pipe section of the Codes Sheet of the program. The code is used to describe the pipe and when required by the program enables a value and a life cycle to be assigned to the pipe type. You may adopt any pipe code configuration that you want but the codes that you use must be exact. Once a code is entered into the code sheet it can be used within column AM on the master sheet.

Often on a drainage line that starts with a pit and pipe segment on the one line of data entry into the system, the line will end with a pit and no pipe. In these cases it is recommended that a "NP" code be used for the pipe (No pipe present) with a zero value attached within the code sheet. This will help tell the full story and will result in all lines of entry having a pipe code attached.

5.4.25   Column AN   Pipe Construction Code **:
The program has been written in a way that allows you to cost the construction of the pipe separate to its supply. The way this is achieved is by linking the cost of construction to the purchase price of the pipe and then factoring that price up or down depending upon the difficulty of construction.

In simple terms a code is used to describe the construction conditions and then a ratio of the purchase price of the pipe is assigned to that code. For example a Code 1A may represent construction within open access, reinstatement with the excavated material and at a moderate depth. The cost of this type of construction being 80% of the purchase price of the pipe. Thus the cost factor within the Code sheet is 0.80

You may place up to 590 different construction codes within the program but in practice 10 - 20 should cover most situations. The most difficult construction situation within the Code block at present is an 8B Code. This code represents confined access to the site with rock excavation and

specialised backfill material at a deep excavation depth. The cost of the pipe construction being 4 times the purchase price of the Pipe.

You may choose in your first draught to assign all pipes to the one construction cost code and then refine the system at a later date. However you must place a Code within this cell if a pipe is present. If the cell is left blank then the pipe valuation will be zero because a zero value has been assigned to the blank cell within the code block on the codes sheet.

5.4.26   Column AO &AP   Pipe Length & Number of Cells **:

The pipe length must be placed here. If you have an accurate set of Co ordinates for the two end pits then the length can be derived from these and I can make the program changes to accommodate this upon request. The number of cells field has default setting of one. But there are situations where multiple pipe cells are used and this information is recorded here and impacts on the replacement cost of the pipe segment.

5.4.27   Column AQ   Total Pipe Length :

This is calculated by the program and is the product of the pipe length and the number of cells.

5.4.28   Column AR   Overall Pipe Condition:

This condition factor is generated by formulae. The formulae is contained within the hidden copy block on row 11 of the master sheet. The program default is to simply make the overall condition equal to the pipe structural condition in the adjacent column. This facility is provided for the advanced user who wishes to create a pipe overall condition based upon several factors within the database.

The formulae that delivers the overall condition is housed within cell AR11 and is copied to the whole database when the update cells containing formulae macro is activated from the drop down menu. The end user may place any formulae within the cell that takes into account any of the variables within the database. This would normally be restricted to the fields within columns AS to AV dealing with pipe properties but it could extend beyond these parameters.

Whatever formulae is used it must allow the condition range to move within the 0 to 10 range. The overall condition factor is the one that is used for valuation purposes and for standard sorts based upon condition.

5.4.29   Column AS   Structural Condition:

The structural condition of the pipe is often the only condition factor assessed and is thus used to derive the current or written down value of the pipe for accounting purposes and is used as the basis for placing pipes in their condition or replacement order.

Pipe condition is a very difficult variable to determine particularly within the smaller size pipes that tend to make up the bulk of the local government asset group. Pipe age records are often used in conjunction with a field survey of a small sample of the assets in order to link the age of the assets to a condition.

Many pipes cannot be easily or economically inspected and each district will need to examine how it approaches this problem. If physical inspections are to be undertaken then the following broad guide to condition based assessment is provided as a starting point. However it is stressed that each council should develop its own condition selection criteria.

- **Condition 0 - 2**
  This condition range would be placed on a pipe that was in very good condition with very little or no sign of concrete deterioration or other wear. It would be expected that pipes under 15 years of age would be within this condition range.

- **Condition 3 - 4**
  Pipes within this range would be showing some signs of early wear but not exhibiting any real problems. The age of the pipes could be as high as 30-40 years.

- **Condition 5 - 6**
  Within this Condition range a pipe is half way through it's useful life. There would be obvious signs of wear within the pipe and perhaps some very minor structural problems but the structural integrity of the pipe would be intact. Minor movement and misalignment within the pipes may also be the cause of this condition rating independent of other pipe problems. It would be expected that the remaining life in the pipe would be 20 - 50 years.

- **Condition 7 - 8**
  At this condition rating there would be obvious signs of wear and perhaps some structural failure of the pipe. Severe movement and misalignment may also be the cause of this condition rating even if the pipe has no obvious ware or other structural problems. With 70 - 80% of the pipe life gone it would be expected that the pipe would be in service for a further 5 - 20 years.

- **Condition 9 - 10**
  A pipe in condition 9 or 10 would be in very poor condition. It would be obvious that the pipe was subject to extreme wear and or perhaps structural damage. Alternatively the movement and misalignment of the pipes would be severe. The pipe would be in need of urgent repair or replacement immediately.

5.4.30   Column AT   Pipe Alignment Condition :

This is an optional condition factor but it will allow you to ascertain the effect on pipe structural condition of the alignment of the pipes. Although you record the alignment condition separately it is recommended that pipes with poor alignment also have their structural condition in column AP downgraded. The reason for this is that really poorly aligned pipes can be the cause of pipe replacement.

The program is arranged such that the overall pipe condition is derived from a series of other factors and pipe alignment can be used as a contributing factor. The default setting is to simply make the overall condition equal to the pipe structural condition. This is because in most instances it is assumed that only one pipe condition factor will be collected. However, the formulae within cell AR11 can be amended to reflect your individual needs.

The condition rating here is 0 - 10 with 0 being perfect condition and 10 where the pipes have failed due to their alignment condition. The following is offered as a guide to the selection of Pipe Alignment Condition.

- **Condition 0 - 2**
  Pipes in Excellent condition with no signs of any alignment problems.

- **Condition 3 - 4**
  Pipes in Very Good condition with only very minimal signs of movement away from their correct alignment.

- **Condition 5 - 6**
  Pipes in Good condition with obvious but not severe signs of miss alignment and movement

- **Condition 7 - 8**
  At condition rating 7 - 8 the Pipe alignment would be a real problem and replacement or remedial works would need to be planned in the near future.

- **Condition 9 - 10**
  Pipe alignment condition 9 - 10 would have the pipes in a severely miss aligned state. The miss alignment would be affecting the function of the pipe and the pipes would need to be replaced or relayed immediately.

5.4.31   Column AU   Pipe Joint Condition :

Once again this condition factor is not a necessary part of the program function however it can be valuable information to have within the database. In selecting the pipe joint condition factor you may wish to have regard to the following notes.

- **Condition 0 - 2**
  Excellent Pipe Joints with no sign of any problems at all.

- **Condition 3 - 4**
  Very Good condition Pipe Joints with only very slight corrosion, separation or other damage.

- **Condition 5 - 6**
  Good condition Pipe Joints with some Corrosion, separation or other damage but not excessive.

- **Condition 7 - 8**
  The Pipe joints would be exhibiting obvious problem signs by way of corrosion or separation or other problems and remedial work would be needed in the near future.

- **Condition 9 - 10**
  A pipe with a Joint condition factor of 9 - 10 would be in serious trouble. The joints would

be badly separated and or corroded and broken. Works to repair or replace the pipes would be needed immediately.

5.4.32   Column AV   Pipe Erosion Condition:

This factor is a measure of the wear associated with the drainage pipe. The wear may be caused by mechanical action or chemical attack. Generally the wear will occur along the low flow line of the pipe. The following descriptions are offered as a guide to the selection of the condition factor. Once again this pipe condition factor can be used as part of the generation of the overall pipe condition in column AR if required.

- **Condition 0 - 2**
  Excellent Pipe Condition with no signs at all of wear.

- **Condition 3 - 4**
  Very Good Pipe condition with only very minimal evidence of any wear or erosion of the pipe material.

- **Condition 5 - 6**
  At Condition 5 - 6 there would be obvious signs of wear and erosion but the condition would not be severe and would not yet require remedial work.

- **Condition 7 - 8**
  At Condition 7 - 8 the wear and erosion would be quite severe and would be needing attention. At condition 8the situation would be urgent in order to avoid future asset loss. In Concrete pipes the erosion would be approaching the Steel reinforcement which may be exposed in isolated locations. Repair work would be required immediately.

- **Condition 9 - 10**
  A pipe with an erosion condition of 9 - 10 would be in a bad way. Repair work should have been carried out on the pipe at an earlier date and the damage already done to the pipe would be partly irreversible. The pipes would need to be replaced or have immediate major repair works undertaken.

5.4.33   Column AW   Pipe Clean Out Condition:

This Factor is a measure of the Silt and debris build up in the pipe (not the Pit). The following explanation of condition factors is offered for your consideration.

- **Condition 0 - 2**
  No problems evident with Debris or Silt.

- **Condition 3 - 4**
  Some minor build up of silt and or debris but not extensive in the pipe and not exceeding 5 - 10 % of the full depth of the pipe

- **Condition 5 - 6**
  Debris and silt build up in the pipe is now obvious and could be throughout the whole length of the pipe and up to 20% of the depth of the pipe.

- **Condition 7 - 8**
  Debris and or silt build up would be a real problem in the pipe with up to 50% of the pipe depth restricted in places.

- **Condition 9 - 10**
  The pipe would be severely restricted with debris and or silt. The extent of the restriction would be in excess of 50% of the full depth of the pipe.

AZ	BA	BB	BC	BD	BE	BF	BG	BH
Pipe Details							Pipe Details	
R L at Inlet	R L at Outlet	Pipe Locat Code	Other	Other	Other	Other	General Comments Relating to the Pipe	Date of Const. M/Y

Figure No.7
Pipe Details Column AZ - BK

5.4.34   Column AZ - BA   Pipe Reduced Levels :
The RL of both ends of the Pipe can be recorded here if desired.

5.4.35   Column BB   Pipe Location Code :
At this stage this piece of information is recorded simply to identify the nature of the terrain and the overlying material. To some extent the information is already present in the Pipe Construction code and you may choose not to bother with this field.

There are a couple of examples within the Code box on the CODES sheet but the use of the Field is optional. The idea behind the field is to make it easy to identify all pipes that are in difficult to get at locations such as under road pavements or buildings.

5.4.36   Column BG   General Comments - Pipes:
Any comments of a general nature relating to the pipe assets can be recorded here.

5.4.37   Column BH   Year of Construction of Pipes:

If known you record the year of construction of the pipe here. As with the pit assets this information is often used as a defacto pipe condition factor so if available it is valuable information.

The format of the field can be a straight integer year or preferably a month and year field that will allow you to filter in whole financial years.

BI	BJ	BK	BL	BM	BN	BO
Pipe Details						
Prop. Next	Pipe Treat.		Pipe	Asset	Date of	Insp.
Type or Code	Replace	Urgent	I.D.	No.	Last	ID
of Treatment	M/Y	0 - 10	No.	of Pipe	Insp.	

Figure No.8
Pipe Details Column BI - BO

5.4.38   Column BI to BK   Proposed next Pipe Treatment:

As with the pit assets there is a dual costing structure within the program that allows you to cost the existing pipe treatment as well as the proposed. This is very useful in situations where an existing pipe size is known to be undersized and its replacement will be larger and hence more costly. Alternatively there may be a lining treatment that will extend the useful life of a pipe rather that replace it. Both of these situations can be catered for within the next treatment section.

If a code is used for a next pipe treatment then the program values the pipe in the valuation section with the old pipe code (as required for accounting purposes). But within the condition report sheets the proposed treatment code is used delivering a far more accurate prediction of the expected future liability cost of the works. The year to be replaced and the urgency ratings in columns BJ & BK are optional within this section and are provided for information only.

If no code is placed within column BI then the program uses the original code in column AM to provide the valuations within the pipe condition sheet.

5.4.39   Column BL   Pipe ID No.:

You may wish to identify each pipe segment with a unique number for accounting or GIS purposes this field will allow you to record a unique pipe ID for each pipe segment.

5.4.40   Column BM   Asset No of Pipe:

This second ID number is provided in case the accounting and GIS systems require different identifications.

5.4.41   Column BN & BO   Date of inspection and Inspector ID:

These two fields are used to record the date of the last pipe inspection and the details of the inspector involved. The date will also be useful in determining the degradation rate of the assets with time as further surveys are undertaken in the future.

Figure No.9
General Details Column BP - BS

5.4.42   Column BP   General comments on this Drainage Line:
Here you record any comments of a general nature dealing with the whole of the drainage asset on this line. That is the Pipe and the Pit and any other associated Matters.

5.4.43   Column BQ - BS   Other
Fields reserved for future or site specific general needs. :

BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE
PIT VALUATION				PIPE VALUATION (Supply & Lay)				TOTAL VALUATION			
Replace. Value $	W.D. Value $	Accum. Dep. $	Annual Dep $	Replace. Value $	W.D. Value $	Accum. Dep. $	Annual Dep $	Replace. Value $	W.D. Value $	Accum. Dep. $	Annual Dep $

Figure No.10
Valuation Details Column BT - CE

5.4.44   Column BT - BW   Pip Valuations

All of these shaded cells within the valuation area have their values calculated by the program. Thus you should make no entries within these cells. Pit valuations are undertaken within Columns BT - BW. The replacement value is drawn from the pit code which is located within column M. The program Looks up the value that you have assigned to the code in column M within the pit code block on the CODES sheet of the Program.

The written down value is then calculated by factoring the replacement value back in a linear relationship depending upon the overall pit condition in column N. The accumulated depreciation is the difference between the replacement value and the written down value.

Annual depreciation is calculated by dividing the replacement value of the asset by the expected life in years as assigned to the pit within the code block of the CODES Sheet

The formulae that are used to derive these values are not stored within the hidden copy block on row No. 11 and can be updated and applied as required via the drop down menu. This is in order to reduce the size of the file. However, you can apply the formulae to the whole of the data at any time by selecting the UG DRAIN 4 drop down menu at the top of the sheet and then selecting "MASTER SHEET GENERAL" followed by "4 Update Shaded Cells that are generated by formulae. This will activate a macro program that copies the formulae to the whole sheet.

5.4.45   Column BX - CA   Pipe Valuations

This is almost a repeat of the above for the pipe assets. The only difference is that the valuations for the pipe assets involve the looking up of two codes. One for the value of the pipe alone in column AM and the other for the cost of construction of the pipe in column AN.

With both the pits and the pipes the valuation is also dependent upon the presence of a "joint works proportion" in column CJ. The default here is 1.00 but if you have a pipe that is shared in cost between you and another party the ration can be recorded here.

5.4.46   Column CB - CE   Total Valuations

The total Valuation in all cases is the sum of the Pit valuation and the Pipe Valuation for that particular drainage line.

Figure No.11
General Details Column CF - CN

5.4.47   Column CF - CI   Location

These fields are used to record general asset location information. Their use is optional and they may be renamed to better reflect a particular use. The "Town or Rural" field is established within the program by examining the contents of column CG. If this cell is left blank the program will assume that the location is rural. If it is within an urban district then the name of the district should be placed within the cell.

The values within column CI can be updated by selecting "MASTER SHEET GENERAL" followed by option No.7 on the drop down menu.

5.4.48   Column CJ   Joint Works Details **

The program default here is 1.00 which results in the whole of the value of the asset being recorded. If however the Drain is along a Shire Boundary or the Capital cost is shared for some other reason then the portion of the asset that belongs to you is recorded here and the asset valuations are factored accordingly.

You must have a value within this cell and in most cases it will be 1.

5.4.49   Column CK - CN   Design Status Details

These fields are provided to assist with the retrieval of information as well as the storage of information. The design drawing reference will assist in locating any drainage plans while the design recurrence interval for the drain together with the drain status could be of use in the scheduling of works.

Figure No.12
General Details Column CO - CU

5.4.50   Column CO   Drainage Line ID

This field is provided so that you can track the segments that belong to the one drainage line. It is recommended that each time you enter a new drainage line that you allocate a drainage line number within this field or use the automatic numbering system within the program.

5.4.51   Column CS   Data Collection Sheet No.

To assist with the management of data the data collection sheet number is recorded here if the data was picked up manually.

5.4.52   Column CT & CU   Temp. Fields

These two fields are used within the program for internal calculations. You can use the fields on a temporary basis if you wish but do not store data that you wish to retain, as the running of certain programs will result in the loss of your data.

6.   Master Sheet Operations

There are a number of operations that can be undertaken on the master sheet. Most can be accessed from the drop down menu titled **"UG DRAIN 4"**. There are two sub sets of operations on the menu directly associated with the Master sheet as well as the "COMMON FUNCTIONS" and "TESTS" menus. Listed below is an explanation of the various operations on the menu.

6.1   MASTER SHEET GENERAL   Menu

There are currently 7 operations attached to this menu as detailed below.

6.1.1   Add new first line of Data Entry – Menu Item 1

This function inserts the first line of a new drainage line. The reason that a separate operation is undertaken to insert a first line is that certain formulae are put into place in subsequent lines within the same drainage line that saves on repeated data entry.

6.1.2   Add Second & Subsequent lines for Data Entry – Menu Item 2

This item allows you to insert as many lines of data entry in addition to the first that you require for a given drainage line. It is recommended that you place your data into the system one drainage line at a time. If you have a line with 3 pipe lengths then you should make 4 data entry line entries.

The first will handle the first pit and pipe. The second will handle the second pit and the second pipe segment. The third will handle the third pit and third pipe segment. While the forth segment will accommodate the forth pit without a pipe segment being recorded or with a "NP" code recorded for the final pipe code to designate that there is no pipe present.

Note that a shaded line will be left under the drainage line information. This is inserted on a temporary basis to assist with the easy location of the bottom of the drainage line information.

You would then proceed to fill in all of the required details within the new data block.

6.1.3   Remove Blank lines between drainage line entries – Menu Item 3

The blank lines that are created between the individual drainage line entries can be removed by activating this program. The program will also remove the active cell formulae and store only the results within the database.

6.1.4   Update shaded cells that are generated by Formulae – Menu Item 4

With the active formulae removed in the above operation they can be reapplied by activating this program. The formulae will be applied and then immediately stored as values only in order to minimise the file size.

6.1.5   Update Total & Average Figures on row 14 – Menu Item 5

The total & average figures that are located on row 14 are in the subtotal format which allows you to examine the values for the displayed rows only when in filter mode. This is a very useful function and should not be overlooked. If the formulae are lost or damaged at any time, they can be regenerated by activating this small program.

6.1.6   Apply Copy Block formats to the whole sheet – Menu Item 6

If for some reason you loose or damage the sheet cell formatting or you want to change the formatting. Then the formatting within row No. 11 (the hidden copy block) can be applied to the whole database by activating this program.

6.1.7   Set town & Rural status within Column CI – Menu Item 7

This operation has been removed from the apply formulae program in 4 above because when there is a large amount of data present the operation can take a long time. It is also something that does not often change and may not be used. Thus the facility has been maintained but separated from the main area.

6.2   MASTER SHEET SORT OPTIONS   Menu

There are a number of standard sorts that have been provided in relation to the master sheet data. There is also the provision for assisted manual sorts of the data.

6.2.1   Drainage Pit Alphabetic Order – Menu Item 1

This program sorts the master sheet data into alphabetic ascending order based upon the contents of column "B" the Pit From ID

6.2.2   Drainage Pit Location Order – Menu Item 2

This program sorts the master sheet data into alphabetic ascending order based upon the contents of column "D" the description of Pit location field

6.2.3   Drainage District Order – Menu Item 3

This program sorts the master sheet data into alphabetic ascending order based upon the contents of column "CH" the Drainage District field

6.2.4   Drainage District Order – Menu Item 4

This program sorts the master sheet data into alphabetic ascending order based upon the contents of column "CF" the District or general Location field

6.2.5   Descending ID Order – Menu Item 5
This program sorts the master sheet data into descending order based upon the contents of column "A" the Segment ID No. field. The purpose of the sort is to update the highest segment ID number within cell I3 so that any new data entry commences with the next number following the existing highest number present.

6.3   COMMON FUNCTIONS   Menu

The menu heading titled "Common Functions" is not restricted to use on the master sheet but will probably be used there most. As the name implies these functions are common to all sheets within the file that take the form of a spreadsheet.

There are short cut keys attached to all of the functions which are also detailed on the drop down menu. The functions include the freezing of panes, the set up of filters, the protection of the active sheet, the selection of all data on the active sheet for a manual sort and the display of the hidden copy block.

All of these functions tend to be used often by an experienced user and so have been programmed into the system. The format of the common functions is the same across all of the excel Moloney programs.

6.3.1   Protect the Active Sheet – Menu Item 1
This menu item or the short cut key strokes "Ctrl Shift P" can be used to protect any sheet in the file that is on display.

6.3.2   Remove protection from the Active Sheet – Menu Item 2
This menu item or the short cut key strokes "Ctrl Shift U" can be used to remove protect any sheet in the file that is on display.

6.3.3   Freeze Panes on Active Sheet – Menu Item 3
This menu item or the short cut keystrokes "Ctrl Shift E" can be used to assist with the viewing of data on any spreadsheet type sheet within the file. The freeze panes mode allows you to maintain the column headings in view while you scroll through the data set.

6.3.4   Remove Freeze Panes – Menu Item 4
This menu item or the short cut key strokes "Ctrl Shift R" can be used to remove the freeze panes mode on any sheet in the file that is on display.

6.3.5   Apply AutoFilters on Active Sheet – Menu Item 5

This menu item or the short cut keystrokes "Ctrl e" can be used to set up the AutoFilters on any spreadsheet type sheet within the file. If you have not used the AutoFilters then you should have a look at this function. They are perhaps the most powerful tool within the excel program.

When applied they allow you to look at the different sets of data within any one column and by selecting one type from a menu filter out app other rows that do not contain that data. For example you could filter within the pit code field for the entry "SEP" for side entry pits. All of the rows that has side entry pits would then be displayed and all others hidden. The sheet total and average figures would also reflect the totals for the filtered set of data.

The custom filter is even more powerful and should be understood fully by all users. It will be well worth spending some time to acquaint yourself with these operations, as they will be of considerable long-term benefit.

6.3.6   Remove AutoFilters – Menu Item 6
This menu item or the short cut key strokes "Ctrl r" can be used to remove the AutoFilter mode on any sheet in the file that is on display.

6.3.7   Select all data on active sheet – Menu Item 7
This menu item or the short cut key strokes "Ctrl x" can be used to select all data on any spreadsheet format sheet ready for a manual sort of the data set. The small program picks up all data below row 22 where the data entry commences. It simply saves time when a manual sort is requires.

6.3.8   View the Hidden copy block – Menu Item 8
This menu item or the short cut keystrokes "Ctrl h" can be used to unhide the rows 10 to 14 on the master sheet known as the "Hidden copy block. This is where the sheet formulas are stores and where you change the default settings for standard data entry items.

Be careful when amending any formulae within the row and it is good practice to keep a copy of the old formulae before amending it. Row 12 also has the minimum data entry requirements marked in red shading.

6.3.9   Hide the Hidden copy block – Menu Item 9
This menu item or the short cut keystrokes "Ctrl Shift H" can be used to hide the rows 10 to 14 on the master sheet known as the "Hidden copy block.

6.4   Testing of Data Entries
There are currently two tests for the data that you enter into the Master Sheet. The first is a test to see if the cell contains a Number greater than Zero and the second to test if the cell contains a number between 0 and 10.

To use the test function first click in the cell of the column that you wish to check at row 22. While this cell is highlighted go to the UDRAIN 4 Menu and select TESTS. Choose one of the options and the program will run down the column testing if all cells are within the range. If the program finds a cell outside of the selected range it will get into a loop which will require you to

press the **Esc** button and then the end option on the box that appears. Once done the problem cell will be exposed and can be corrected.

Some common mistakes that occur are the inclusion of a space bar entry within a number or the inclusion of two decimal points within the one number. Both of these faults will result in Excel not recognising the cell as a number and both can be found using the Tests.

If you make an error entering a code for the Pit, Pipe, Proposed Pit Works or Proposed Pipe Works then you will see an error in the valuation column within the relevant report. You should rectify the error on the Master Sheet and then run the relevant program again to update the correct data into the report. I am working on a program to check all codes and numeric entries as now exists within the roads program but it is not ready yet.

The best way to find all of the code errors is to use the AutoFilters on the valuation fields and choose contains N/A. this will display all of the rows with incorrect codes and you can check and correct

You will find that it is far easier to use the **Ctrl "n"** for the Number greater than 0 Test and the **Ctrl "t"** for the Test for a number between 0 & 10.

6.5   Minimum Data entry Requirement:

In order to have the program function and return a value for your underground drainage assets you will need to have a correct entry within all of the fields above that are marked at the heading with this mark   ✱✱ . The minimum data entry requirement can also be viewed as a red shading on row 12 of the Master Sheet.

7.0　　　The Drop Down Menu

The items that relate to the Master sheet on the drop down menu have been dealt with within section 6.1 to 6.3 above. This section will deal with all other options on the drop down menu.

7.1　　　RUN REPORTS - Menu

This menu has 7 items contained on its sub menu. The first runs all reports within the file. If in any doubt about what to run this will deliver all reports. This report commences by updating the cells containing formulae on the master sheet and then moves on to produce all other reports within the file. The only item that it does not run is the small program that sets the rural or urban status of the assets. The reason is that in a large data set this operation can be very long. The data very seldom changes and you will need to manually update the program from the "MASTER SHEET GENERAL" Menu item No.7.

Under the first item there are a further 5 items that allow you to update individual reports. If for instance you had just inspected all pits and wanted to update that data you could select the appropriate reports to run. However, It is strongly recommended that you run all reports in most cases rather than take the chance of missing something.

The final program on the "RUN REPORTS" Menu will clear all reports from the file and help to reduce the file size for storage. Note that this program does not effect the master sheet or the codes sheet where permanent data is stored. Only the reports that were drawn from that data are removed in this operation.

7.2　　　VALUATION SHEET - Menu

The valuation sheet is provided as a convenient means of displaying the individual asset component valuations. The information is all drawn from the Master Sheet and rearranged into a format for valuation purposes.

7.2.1　　　Run Valuation Sheet Report – Menu Item No.1

This menu item enables you to update the valuation sheet as a single operation. Often the report will be generated in conjunction with the running of all reports as in section 7.1 above.

7.2.2　　　Run Valuation Sheet Report – Menu Item No.2 - 7

The remaining 6 items on the valuation menu relate to the sorting of the sheet into various ways and the formatting of the sheet for A4 Printing. When the report is first run it will be presented ready for printing in an A4 format. However, like most other sheets within the system there will be far more detail present than can be printed out in a single A4 sheet. The additional fields are present because it is felt that they may be needed for special reports.

You can look at all columns within the valuation sheet by selecting the entire sheet and then from the excel menu choosing FORMAT / COLUMN / UNHIDE. This will display all of the available information on the sheet. The original A4 formatting for printing can then be reproduced from the item No.7 on the Valuation Sheet Menu.

7.3　　　PIPE CONDITION SHEET - Menu

The format for this menu item is very similar to that of the Valuation sheet menu. There are 8 items on the menu. The first generates the pipe condition report sheet as a single item. The next 6 provide a variety of standard condition sorts such as pipe structural condition, joint condition, alignment condition etc.

The final menu option sorts the pipes by code first and then condition. Once this is done it groups the pipes by code type and provides a separate set of total figures for each pipe class.

Valuations for the replacement costs on the PIPE CONDITION Sheet can be different to those on the valuation sheet. This is because the intention of both the pipe and pit condition sheets is to reflect as accurately as possible the real cost of the rehabilitation of the assets. This is achieved by having a separate code for the proposed replacement format of the asset. For example an open drain may be planned to be replaced with a pipe. The condition sheet if used to its full extent should reflect the estimated future liability for the asset group.

Note that if you do not nominate a next treatment the program assumes that the existing treatment will be repeated when the asset is due for replacement.

7.4 PIT CONDITION SHEET - Menu

The pit condition sheet menu is a duplicate of the above which operates on the pit assets and not the pipe. Note that both the Pit and Pipe condition sheets both have a vast array of other fields that can not be displayed within an A4 printing format. Like the Valuation sheet many columns are hidden but can be accessed via the FORMAT / COLUMN / UNHIDE menu. Provision has been made within the Pit and Pipe condition sheet menus to rearrange the sheet back to its original A4 printing format.

7.5 PIT MAINTENANCE SHEET - Menu

Provision has been made within columns Z to AB of the Master sheet to record the details of any pit maintenance works that need to be undertaken. In fact the maintenance is not restricted to activities on pits alone and could extend to maintenance work on pipes as well. The pit is used as a convenient way of location the maintenance activity.

A code is created that describes the required maintenance activity. It is then allocated a value within the CODES Sheet and then it may be used within the master sheet. The PIT MAINTENANCE Sheet is generated by bringing the details of all maintenance activities that were identified within column Z on the MASTER SHEET to that sheet. The PIT MAINTENANCE Sheet then becomes a summary of all of the requires maintenance activities within the drainage system.

The 5 items on the drop down menu are very similar in nature to the above menus in that item one generates the report as a single action. Items 2 to 4 provide standard sorts of the data and item 5 formats the sheet for A4 printing. Once again there are many more columns present in the report than can be printed in an A4 format.

7.6 FINANCIAL MODELLING - Menu

This menu provides access to the financial modelling functions of the program. The program allows you to model the future financial demand on the system. This area will be dealt with in detail later within the report as a separate item.

7.8   TESTS - Menu

The current tests menu is very limited. It enables the testing of numeric data within the 0 to 10 range or a simple test to see if a cell is a numeric value or not. The tests are not terribly sophisticated and it is planned to upgrade the testing to the same standard as now exists within the roads program. Here a program has been written which verifies all entries and provides a report sheet detailing all the incorrect codes as well as numeric entry errors.

7.9   BACKUP - Menu

The backup menu works in conjunction with the **UGD Backup. xls** File. You are able to send the base data from your **Ugdrain4. xls** file to the UGD Backup file for later retrieval. This is a little insurance in case something goes wrong with the file or your data is accidentally lost. The data that is transferred to the backup file is all of the data on the master sheet and the codes sheet.

The second option on the backup menu allows you to retrieve the data set from the UGD Backup file back to the Ugdrain 4 file. This is a serious operation, as it will delete all of the existing data within the Ugdrain 4 file and replace it with the backup data.

You will be given a single warning when you attempt to replace the UGD Backup file with the data from the Ugdrain 4 file. When doing the reverse you will be given two warnings as this operation is a very serious change to your database.

As with other modules the files can be in any directory location. But to access a second file from an open file both files need to be within Excel's active directory. In effect this means that for the Ugdrain 4 file to successfully open the UGD Backup file the Ugdrain 4 file must have been opened from within excel from the file menu with the full directory path being followed.

Double clicking within explorer or on the last accessed excel file will result in a program error message saying that the file cannot be found. The same error message will occur if you open another excel file after accessing the Ugdrain 4 file and then try to use the BACKUP menu.

8.0   Data Entry – Pit set up

Data entry is undertaken on the "**MASTER SHEET**". Data entry is arranged in drainage line runs. Figure No.9 Below illustrates a branched drainage line. This system would be put into the Program as two separate Drainage Lines. Line No. 1 would consist of the Drainage line from pit A1 to Pit A4. The second drainage line would commence at Pit A3 and terminate at Pit A3/2.
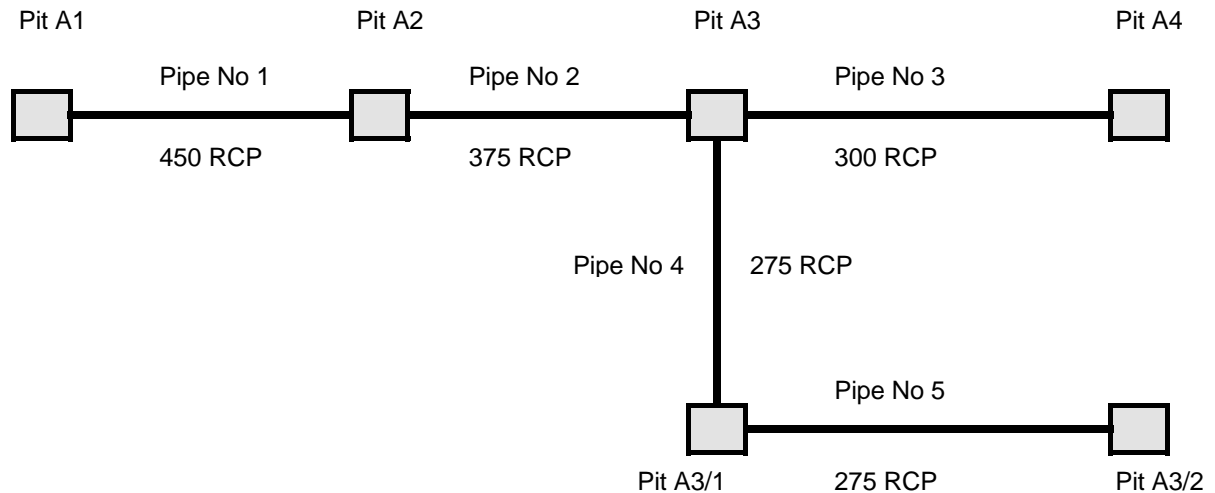

Figure No.13
Drainage Line set up

The first line of data entry would Cater for the Outlet structure or pit illustrated in the above Figure No.13 as Pit A1 and the first segment of pipe being Pipe 1. Pit A2 on this line of data entry would be recorded as the pit To. The details of pit A2 if entered into the first line of data entry would be there for information only. But the number of the pit would certainly be recorded within the pit to field in column C.

The second Line of data entry would accommodate Pit A2 and Pipe 2, while the third line would accommodate Pit No3 and Pipe 3. The final line for this drainage run would contain just the details of Pit No4 with an entry of NP in the code location for the Pipe on line 4 which indicates that there was no pipe present for that segment. An NP code could also be used within the Pit to line 4 of the data entry for this drainage run.

The second drainage line commences at Pit A3 and this would be entered into column A but since Pit A3 has already been accounted for in the last drainage line then a DP would be placed for the Pit Code. This indicates that the pit is a duplicate pit which has been accounted for within another drainage line. The details of Pipe No 4 would be entered on this same line as the Pipe for that segment.

The second line of data entry for this second drainage line would contain the details of Pit A3/1 and Pipe No 5. The last line would contain the details of Pit A3/2 and would have a NP entry

within the Pipe Code on line three indicating that no pipe was assessed within that segment. An NP code could also be used within the pit to location to indicate that no pit was present.

If Pit A3/2 were just an open ended pipe with no actual pit structure present it is recommended that you still create a segment for the recording of the pit details. In this case the Pit Code would be a NP indicating that no pit was present. This is recommended because the full story of the drainage line is then recorded and no confusion is created as to weather the last pit was accidentally left off the list.

In the above example if there were no structure at all at the Pit No1 Location and the pipe simply terminated at a watercourse then within the MASTER SHEET you would still need to place an entry in column B. A pit identification number would still be assigned (A1) in this case even though there was no pit present. The pit code would be NP indicating that there was no asset at that location.

The reason for identifying the Pit status at both ends of all pipe runs is to ensure that the matter has been considered and was not simply forgotten.

In summary it is recommended that:

- Pit numbers or Id's be allocated to both ends of every pipe even if there is no pit asset present.

- The code NP be adopted where a pipe or pit is not present within the segment.

- The code DP be adopted where a pit has been assessed within another drainage line and the pit is duplicated within a second drainage line (duplicate pit).

8.1   Data Entry - Generating New Lines

For the first short drainage lines in Figure No 13 above (Pit A1 - A4) you would need to generate a data entry block with 4 lines of data entry. The first line would be generated on the drop down menu as follows:

UG DRAIN4 /MASTER SHEET GENERAL / 1. Add first new line for data entry (or Ctrl a)

The next three lines would be generated by repeating the instructions below 3 times:

UG DRAIN4 /MASTER SHEET GENERAL / 1. Add second & sub. lines for data entry (or Ctrl z)

Figure No 14. below illustrates the suggested pit numbering system and the Codes for the Pits and Pipes. The data entered into Figure 14 illustrates that there is no pit present at the outfall thus a code of NP is placed in column M for the pit code in line 1. Note that a Pit from Id of A1 is still

placed within column B even though there is no asset present. The program is accounting for the pit from in each line of data entry and the pit To is recorded for information only.

Similarly on line 4 of the data entry an NP is placed within column AM for the Pipe Code to indicate that there is no pipe segment present here. If these NP codes are not placed the program will still function with no problems but it is felt that the use of these codes fully explains to a later user of the data what is on the ground and does not leave them wondering if an asset was forgotten.

Note also the use of a NP description for the pit to in line four. The forth line is present just to accommodate the last pit in the line which is a pit from. Once again the inclusion of a NP in column C assists with telling the whole story and indicates that there was no pit present at the pit to location.

B	C	M	AM
PIT FROM	PIT TO	Pit De	Pipe
Pit I. D. Details	Pit I. D. Details	Pit Code Or Type	Code or Type of Pipe
A1	A2	NP	P300
A2	A3	SEP	P300
A3	A4	SEP	P375
A4	NP	SEP	NP

Figure No.14
Sample drainage entry detail

Upon completion of data entry or at regular intervals throughout the process you can remove the yellow shaded lines between the blocks of new data entry by using command on the Drop down menu. This command removes the spaces between the blocks of data entry as well as taking away the active formulae that are contained within the shaded cells of the Master Sheet. If you need to update the values at a later date this can be done from the Update shaded cells that are generated by formulae command on the drop down menu.

If you find that the generation of new lines of data entry is slowing down then you should run the **Remove Blank lines between drainage line entries** program from the drop down menu. The process of pushing down the valuation formulae each time a new line of data is entered can become a big task and this operation will remove the formulae and store the results as values only.

9.0   Financial Modelling Functions

There are three sheets which act together to form the capital financial Modelling tools within the program. The same three sheets are used to undertake the modelling of the pit and the pipe assets. The three sheets are as detailed below

- **Existing Cond. Graphs**
- **Predicted Condition**
- **Predicted Capital Requirement**

The basis of the modelling is that the existing condition distribution of the two asset groups is stores within the "**Existing Cond. Graph Sheet**" and is taken as the condition starting point for the pit or pipe assets. The model then degrades the assets annually, based upon the expected life within each asset condition rating. From here there are two paths followed. The "**Predicted Condition Sheet**" takes a 50-year proposed capital expenditure profile (that you supply) and removes the poorest condition assets to the value of the proposed capital expenditure and replaces then with new condition assets. It degrades the assets within each condition rating by pushing the required value into the next worse condition rating on an annual basis. It undertakes this task out to the nominated year ahead (1 – 50 Range) and provides a predicted new asset condition distribution and a value of the asset that is expected to be above the replacement intervention level.

The second path is calculated on the "**Predicted Capital Requirement Sheet**". The modelling undertaken on this sheet is similar in nature to the above path. However, this time a condition replacement intervention level is nominated and the model calculates the required capital expenditure necessary to maintain the whole of the asset group within the adopted upper condition limit.

The model commences with the existing condition distribution and uses the same degradation curve as above to degrade the assets with time. The value of the assets that reaches the intervention level is then returned as a capital expenditure requirement. The model assumes that the annual expenditure requirement has been met every year and thus returns that amount of the asset base as new condition assets each year.

9.1   Setting up the Capital Financial Model

To set up the pit or pipe sub asset group for capital financial modelling, choose the required sub asset from the Drop down menu. Detailed below is the path to model the pit assets.

UG Drain 4 / FINANCIAL MODELLING / 2. Set up for Modelling Pit Assets.

9.2   The Financial Modelling Sheets.

The three sheets listed above will be examined individually within the next three sub sections.

9.2.1   The Existing Cond. Graphs Sheet

The **"Existing Cond. Graphs Sheet"** is created from data within the master sheet. The sheet presents a summary of the existing condition distribution for the pit and pipe assets. There are two graphs for each of the sub assets. One is based upon the percentage of the asset base within each of the 0 – 10 condition ratings and the other is based upon the replacement value of the assets within the condition ratings.

The graphs are generated by a built in program that finds the value of the assets within each condition rating on the master sheet and stores this data within a table on the Existing Cond. Graph Sheet. The figures are updated when the run all programs menu item is selected but it can be run separately from the following menu command.

UG Drain 4 / FINANCIAL MODELLING / 1. Update Existing Cond. Graph Sheet Data

9.2.2   The Predicted Condition Sheet

The "**Predicted Condition Sheet**" models the future condition of the asset group based upon an adopted 50 year proposed capital expenditure profile. The Program user sets the following variable data into the model.

- **Proposed 50 Year capital expenditure profile**

- **Expected decay rate of the assets through the 0 – 10 condition ratings (Expected time within each condition rating)**

- **The proposed intervention level when it is considered that the asset should be replaced or rehabilitated.**

- **The year ahead that you want to predict the condition distribution for.**

Then the program is activated by the short cut Keys (Ctrl "k") or via the drop down menu as detailed below:

UG Drain 4 / FINANCIAL MODELLING / 4. Predicted Condition sheet update after Modelling Changes

A more detailed description of the above process is contained below.

Table B1. Of the Predicted Condition Sheet, stores data relating to the year and the proposed Capital expenditure. The modelling tools allow you to model out to 50 years. You are required to provide a proposed capital expenditure profile within cells B12 to AY 12. The present year for the commencement of the modelling period is generated with the running of the update program.

Table B2. Has only one column of variable data Column B. the values within Cells B21 – B31 are initially drawn from Cells B196 – C206 on the Existing cond. Graph Sheet as the sub asset data is loaded into the model. In effect this is the location of your default degradation curve figures. You may trial any asset life profile that you want. The age condition profile may be very different for the pit and pipe assets and this is why a storage facility has been provided.

It should be noted that the life cycle for the sub assets is not linked to the adopted depreciation life cycle but clearly it should be close to that cycle. By amending the figures within Cells B21 – B31 you can trial an optimistic and pessimistic life for your assets. There is a graphical representation of the "ASSET TIME CONDITION RELATIONSHIP" within Graph B3 of the Predicted Condition Sheet.

Within Table B3 you place into the Green Cells G19 & I19 the year ahead that you wish to examine (a Number from 1 – 50 into Cell G19) and the Condition replacement intervention level (a number between 0 & 10 into Cell I19). Other Cells within the Table are generated by Formulae with the Program and should not be touched.

Table No.B1   20 Year Proposed Annual Capital Expenditure Profile

Year No.	1	2	3	4	5	6	7	8	9	10
Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Prop Exp.	50,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Av. Annual Exp.	50,000	75,000	83,333	87,500	90,000	91,667	92,857	93,750	94,444	95,000
Present Year is	1998									

Table No. B2 Expected Life Within each Condition Rating

Condition Factor 0 Good 10 Bad	Expected Life in Years Within Condition	Expected Age at end of Cond. Condition	Probable Annual Condition Rise	Cumul. Prob. Cond. Rise
10	**0.00**	80.20	0.0000	1.7753
9	**2.40**	80.20	0.4167	1.7753
8	**6.40**	77.80	0.1563	1.3586
7	**9.60**	71.40	0.1042	1.2023
6	**10.40**	61.80	0.0962	1.0982
5	**13.00**	51.40	0.0769	1.0020
4	**14.40**	38.40	0.0694	0.9251
3	**9.60**	24.00	0.1042	0.8557
2	**6.40**	14.40	0.1563	0.7515
1	**5.60**	8.00	0.1786	0.5952
0	**2.40**	2.40	0.4167	0.4167
	80.20	Total Asset Life	Condition 0 is New. Condition 10 has no remaining Value	

Table No. B3 Set Required Year & Replacement Intervention Cond

Year Ahead to be Analysed	Year	Replace. Int. Condition	Value above Int. Level	% above Int. Level
25	**2023**	**8.00**	**405,457**	**3.98**

NOTE:
1 To Print the Three Graphs Below
 Print Pages 2 - 4

Figure No.15
Predicted Condition Sheet - Variable Data

Figure 15 above illustrates the three tables containing the variable data that may be altered within the "**predicted condition**" financial modelling sheet.

The Predicted Asset Distribution Graph that results from the model is a graphical representation of the predicted asset condition distribution within the year ahead that is nominated within Cell G19. As well as indicating the condition spread the Graph also provides important information such as the estimated percentage of the network above the nominated intervention level and the weighted average asset condition.

Figure 16
Asset Predicted Condition Graph
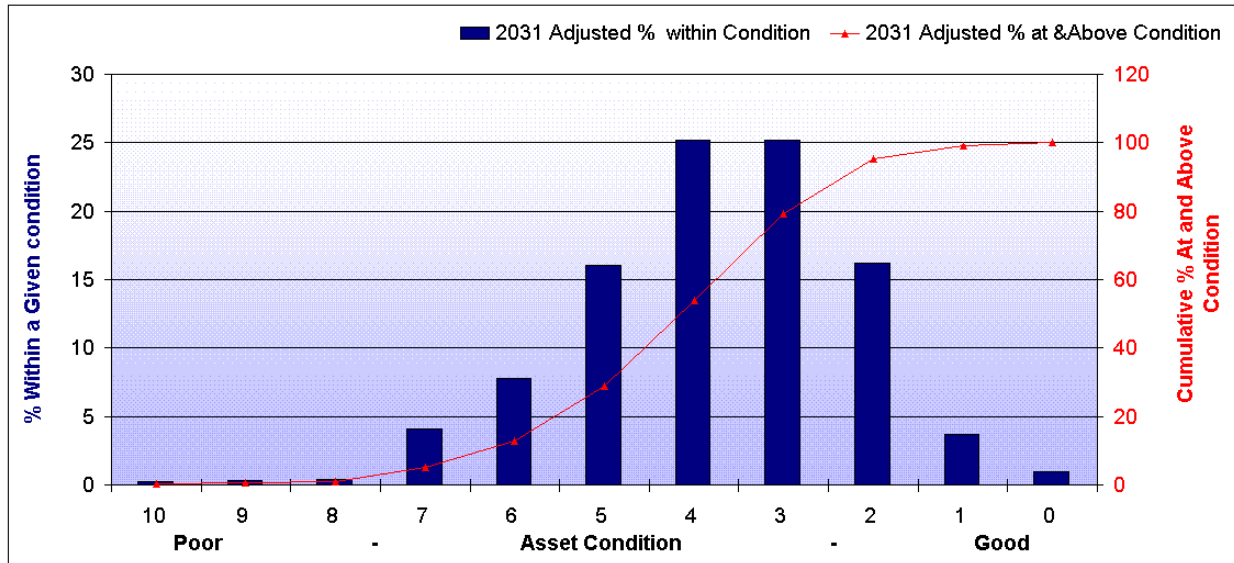
Figure 16 above illustrated the predicted asset condition distribution for the pipe asset group in the year 2031. Note that the Replacement Intervention condition level has been set at Condition 8 and the program is predicting 0.93% of the network to be above the intervention level. At the bottom of the graph you will note that the average Annual Capital expenditure is $46,666 and the overall average Condition of the asset group in 2031 is predicted to be Condition 3.76 from a starting point of 1.72.

Graph B2 is similar in nature to the graph in B1 above but instead of plotting the percentage of the network against condition this graph plots the Replacement value of the network against the condition.

Graph B3 is a graphical representation of the asset time – condition relationship. The graph plots the decay of the assets with time as detailed within Cells A21 – B31 on the same sheet. In general the graph would be expected to be flat at each end where the asset decay is greatest and steeper in

the mid section where asset decay is slower. To a large extent the shape of the curve will depend upon how you assess the condition of the assets. In the long term the life within each condition rating will be calculated via a consideration of the probability of a condition rise from actual successive surveys of your network. This can be done manually or via a program with the Access version Program
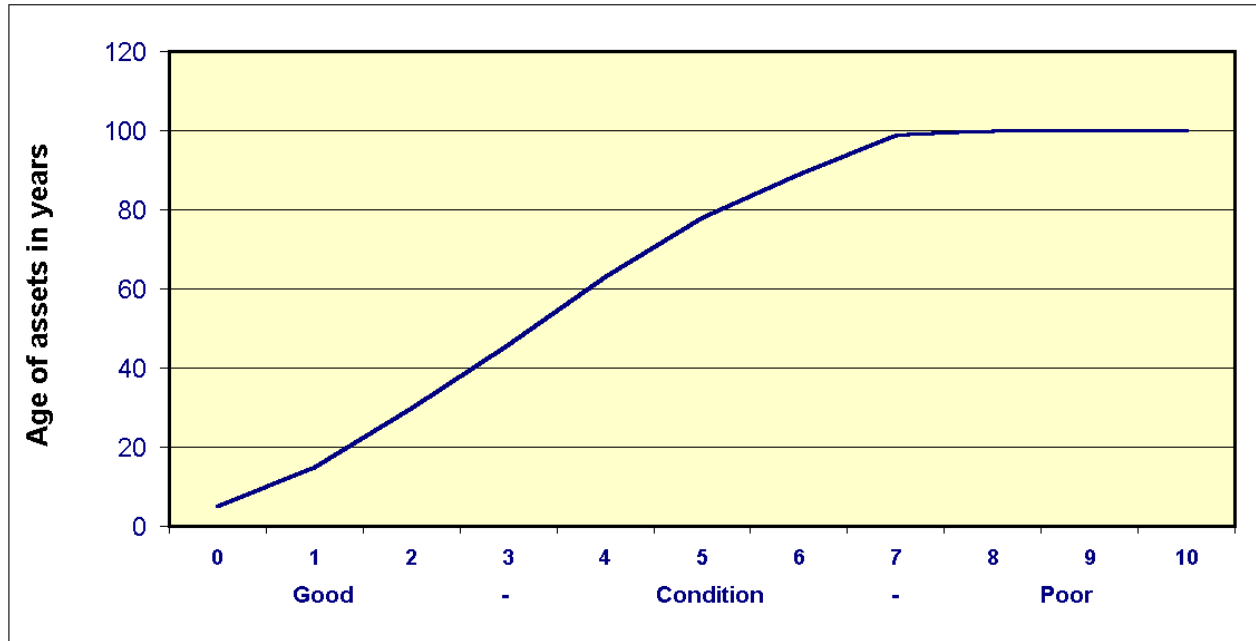

Figure 17
Predicted Cond. Sheet - Asset Degradation Curve

Predicted Condition Sheet Summary   This Financial Model allows you to forecast the future asset condition of the two asset groups over a 50-year period by varying the following parameters.

- **Annual Capital Expenditure**
- **Rate of decay of the assets**
- **Replacement intervention level for Asset Condition**
- **The year ahead Being in the range of 1 – 50 years**

You may model any configuration of the above variables and have the program predict the future asset condition distribution and the extent of the asset group above the adopted intervention level.

NOTE: Each time that you amend any of the parameters above you must run the "**Predicted Condition Sheet**" Program from the drop down menu or access it with the "**Ctrl k**" short cut keys in order to update the figures and graphs.

9.2.3   The Predicted Capital Requirement Sheet
This sheet predicts the annual capital expenditure required to maintain the sub asset group within a given condition rating. The sheet commences with the asset condition distribution as stored in the

Existing Cond. Graph Sheet. The model then uses the same asset decay rates as set up within the "**Predicted Condition Sheet**" to decay the assets over a 50 year period. The only variable that you may amend on this sheet is the Replacement Intervention Condition level of the Asset within Cell E11. If you wish to amend the Asset Decay rate then this can be done but you must undertake the amendments within the "**Predicted Condition Sheet**" Cells B21 – B31. Note that the "**Predicted Capital Requirement**" Sheet is an active sheet and will react immediately to both of the above changes.

The sheet uses the same asset degradation curve that was developed within the predicted condition sheet. Thus amendments to the asset life cycle within cells B21 - B31 of the "Predicted Condition" Sheet will also impact on the figures within this sheet.

There are three graphs associated with the sheet that plot the predicted Capital expenditure requirement in three different forms.

Graph C1 plots the capital expenditure requirement by averaging out the figure over 5-year blocks. This will tend to spread out the heavy spikes that may occur in the first year if your assets need a large injection of funding to bring them up to an acceptable standard. The graph also plots the expected change in the overall asset condition with time. Remember that the model is replacing assets as they reach the intervention condition and not maintaining the assets in a constant overall average condition.
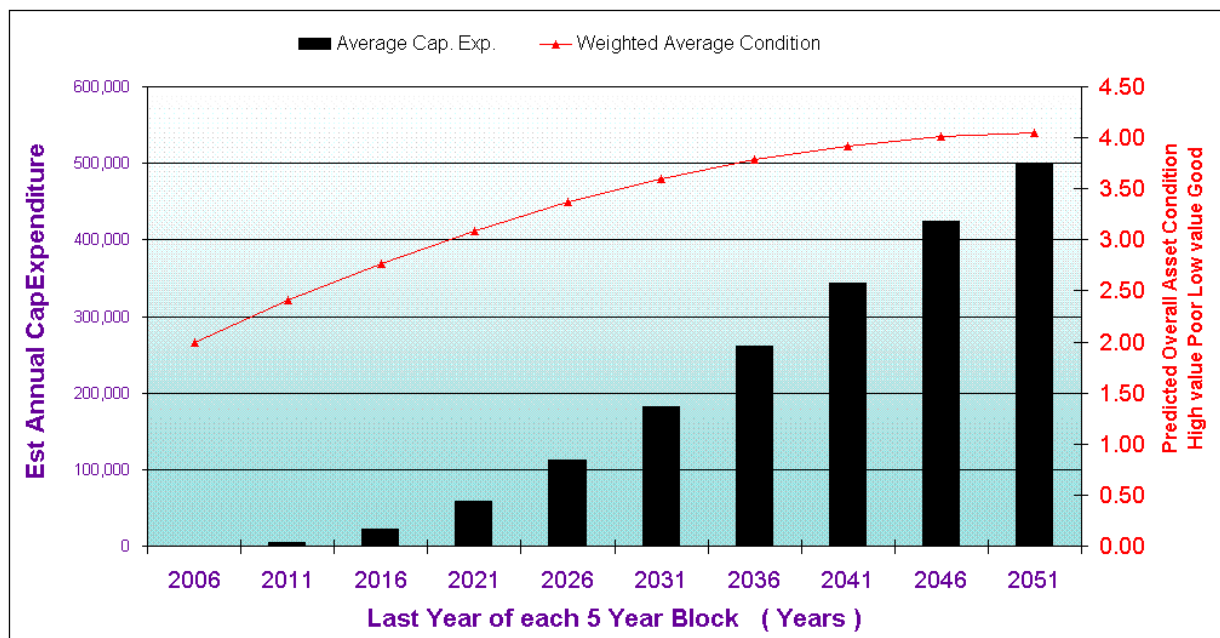

Figure 18
Predicted Capital Requirement Graph C1

Figure No.18 above is a 50-year capital requirement projection for pipe assets. Because of the long-term nature of these assets and their relatively good commencing condition the model is predicting a very low early capital expenditure requirement.

If your assets are in very good overall condition and you nominated a high (Low Standard) replacement intervention condition then your early year capital expenditure may be low but your overall average asset condition would be degrading. Similarly if you had assets in poor overall condition then it would be expected that your early year capital expenditure would be high and your asset condition would be improving. You can use this modelling tool to examine a whole range of future funding possibilities.

10.0   PROTECTING YOUR DATA

Once you have collected all of the data relating to your underground drainage assets you have at your disposal a very valuable set if information. It is important to secure the data that you have spent much time and money in collecting.

There are two sheets within the program that contain your individual data the first is the **MASTER SHEET** and the second is **CODES** Sheet. These two sheets contain all of the data necessary to produce the full set of reports. No other sheet contains any original data. Don't forget the importance of the CODES Sheet. If you have a range of pipe sizes and pit configurations within the CODES Sheet all with different unit costs and life cycles then you will need to reproduce this information on an annual basis for accounting purposes.

You can imagine how difficult it would be to arrive at the same level of annual depreciation from the same set of data on the MASTER SHEET if your codes and values were lost. Thus you MUST keep a copy of at least the values within the MASTER SHEET and the CODES Sheet in a safe place. With this data you can always reproduce all of the reports in the same format.

To assist with this process the UGD Backup. Xls file has been added to the system. This will allow you to create a backup copy of the master sheet and the codes sheet. Make sure that you keep an up to date copy of the UGD Backup file

10.1   Protecting the Working sheet

All of the Moloney Asset Modules within the Excel Format have programmed into them the standard Excel Protect and Unprotect commands attached to a Shortcut Key

Protect the Active Sheet   **Ctrl Shift "P"**
Remove Protection from the Active Sheet   **Ctrl Shift "U"**

It is recommended that when working with the MASTER SHEET in particular that you always have the Sheet protection activated. This will prevent accidental loss of the program formatting although the data that you have entered can not be fully protected but with protection on you will not be able to delete whole lines or columns of data.

11   OPERATIONAL MATTERS

The following operational matters are presented for consideration.

11.1   Modifying the Data Entry Sheet:

Having decided what information you are going to collect in the field you may wish to amend the "Data Entry Sheet" so that it contains only the data columns that you intend to use. This will save confusion and make the data collection process and data entry far simpler.

With the file-opened move to the "DATA COLL SHEET" which should be at the far right end of the Sheets. It is best to copy the DATA COLL SHEET in its present form to a new file where you can amend it at will. This will preserve the original sheet for future use and is the recommended course of action.

You may need to check the page set up details for the new sheet and amend them so that the new sheet is formatted for A4 printing. The original **DATA COLL SHEET.** has very fine margins and is heavily reduced in size in order to fit into the A4 Format. You will need to blow the sheet up to an A3 format for field use. This can be done on a photocopier.

11.2   Modifying the UD Master Sheet for Data Entry

The UD Master sheet can be modified so that the Columns that are not being used are hidden from view. This will greatly assist with the data entry process. It is recommended that during the Data entry process the MASTER SHEET be modified to reflect the exact column structure of the Data Collection sheet that you are using.

This will make the job of data entry far more accurate and less confusing. To hide an unwanted column you use the standard Excel tools as follows.

Click onto the Letter of the Column that you want to hide (This may be Multiple columns at once). Then from the Menu Bar choose **FORMAT / COLUMN / HIDE.** The selected column or columns will now be hidden. To bring back into view the hidden columns you highlight the column letters either side of the hidden column then from the menu bar choose **FORMAT / COLUMN / UNHIDE** and the hidden columns will reappear.

11.3   The Hidden Copy Block on the UD MASTER Sheet

The program generates new blank lines for data entry by copying a Master Copy Block that is located on line No.11 of the MASTER SHEET. Because this line is copied to all new data lines if you are repeating data entry details within a column for a long period then it may be worth while placing the entry into the Hidden Copy Block as a Default. Rows 10 - 12 should be hidden from view at all times other than when you wish to make changes to the default settings that are copied to the new lines of data entry. These three rows contain the template from which the new lines of data entry are copied. They also contain the formulae that generate the values within all of the grey shaded cells in the main body of the Master sheet.

To assist with the viewing of the hidden copy block a program has been written that shows and hides the three rows involved. To view the block use the short cut keystrokes (Ctrl h) or check the

menu item titled COMMON FUNCTIONS. Similarly to hide the block again use (Ctrl Shift H) or the appropriate menu item on the COMMON FUNCTIONS.

11.4   Auto Filters &Total & Average Overall Figures

Row No. 14 on the MASTER SHEET has a series of overall Total and Average figures for the whole Sheet. This facility is carried forward to most of the other reports. The Total and Average figures have been set up as Sub Total Figures which allow you to use the Excel Auto Filter command to have the sub totals reflect the displayed or filtered data only.

This is a very useful tool and will allow you to produce many quick and useful individual reports. The module has a program that automatically sets up the Autofilter process on all spreadsheets within the file. This is accessed via the drop down menu as follows.

 UD-DRAIN 4 / COMMON FUNCTIONS / 6. Apply Autofilters

Once set up you click on the arrows and select the criteria that you want. If you have not used this facility before it is very easy to use and extremely powerful. It would be well worth spending a little time to experiment with this function.

The overall total and average figures on row 14 can be updated if the formulae are lost via the drop down menu as follows.

UD-DRAIN 4 / MASTER SHEET GENERAL / 5. Update total & Average figures on row 14

11.5   Accessing the File Programs

All of the file programs are attached to the **UG-DRAIN 4** Drop down Menu. They are arranged in logical groupings and will be generally self-explanatory. Some of the more commonly used functions also have short cut keystrokes attached. These are all detailed on the drop down menu.

11.6   Asset Valuation

Within the Underground drainage Module Two sub assets have been identified. These are Pits and Pipes. The program delivers four valuations for each of the individual sub assets and then totals the valuations in each Class. Asset Valuations are derived within the **MASTER SHEET** but are presented within the **VALUATION** Sheet for printing out in an A4 format.

The four valuations are as detailed below.

- **Replacement Value:**
  This value is calculated in the case of the pipe by looking up the value assigned to the Code in the "Sub Asset Code Block" and multiplying it by the length of pipe in the segment. For the pit the program simply returns the value of the pit as contained in the "Sub Asset Code Block".

- **Written Down Value:**
  The Written Down Value of the asset is calculated by modifying the replacement value by the overall condition factor for the asset. The replacement value if modified in a linear manor by the asset condition factor to produce the written down or current value. The formulae that generates the WDV can be viewed within the hidden copy block on row 11 and can be modified if required.

- **Accumulated Depreciation:**
  The Accumulated depreciation is simply the difference between the Replacement Value and the Written Down Value. It is the amount of the value of the asset that has been spent at the date of the inspection.

- **Annual Depreciation:**
  The Annual Depreciation is the estimated value of the asset that is lost annually due to normal deterioration. The program adopts a straight-line depreciation with the figure being calculated by dividing the Replacement Value by the expected life of the asset. While this approach may not be perfect it is considered that over the whole asset range given the large spread of construction dates the overall outcome will provide an accurate reflection of the annual loss of capital asset. However, the formulae that derives the Annual Depreciation can be modified it suite your needs.

11.7   FURTHER INFORMATION:

If you require any further information on any matter relating to this Asset Module please contact.

Moloney Asset Management Services
26 Wyndham Street
Newstead
Vic 3462

E-mail peter@moloneyassets.com

Ph	**0354 762234**
Fax	**0354 762772**
Mobile	**041952973**