Sewer Rehab Module

City of Fontana

Public Works Department

Objectives

- Program Level Costs
- Program Level Information
- Project Level Information

Presentation

- Pipe Rehab Setup
- Sewer Rehab Model
- Rehab Projects

PIPE REHAB SETUP

Pipe Rehab Setup

The Sewer Rehab program contains several setup modules used. These modules will help determine which pipes are selected for rehabilitation or replacement, which work tasks need to be performed, and the cost to rehabilitate the sewer network. Follow the links below for additional information.

Rehab Work Tasks and Costs

PWD Pipe Rehab Work Tasks

Default Task Cost

Default Task Cost

In the upper-right corner of the **Rehab Work Tasks and Costs** module you'll see seven Default Task Cost fields. These are pictured below:

You'll use the top six fields to record the cost per foot to perform the rehabilitation work task in this record on each of six different pipe classifications listed below (for pipes up to 10 feet deep).

- Easy Access/Unpaved Pipes
- Difficult Access/Unpaved Pipes
- Easy Access/Paved Pipes
- Difficult Access/Paved Pipes
- Easy Access/Heavy Traffic Pipes
- Difficult Access/Heavy Traffic Pipes

> **Note:** Pipes are assigned to these categories using the parameters established in the Accessibility and Surface Types setup modules.

You'll also see a Cost per each VF > 10 ft field. Use this field to record the cost per vertical foot to perform the rehabilitation work task in this record for pipes at a depth in excess of 10 feet. The model will use the pipe's average depth when calculating this cost.

PWD Default Task Cost

Default Task Cost - Up to 10 feet Deep

	Easy	Difficult
Unpaved	13000.00	15600.00
Paved	13000.00	15600.00
Heavy Traffic	13000.00	15600.00

Cost per each VF > 10 ft   1300.00

Costs Per Pipe Diameter

Costs per Pipe Diameter

This grid in the **Rehab Work Tasks and Costs** module allows you to set up rehabilitation costs per pipe diameter. You can create as many Cost per Diameter records as needed. If a pipe meets the diameter criteria established below, these costs will be used instead of the initial Default Task Cost defined in the parent **Rehab Work Tasks and Costs** record.

1. Right-click in the grid and select **Add Record**. The following window will appear:

Diameter Costs

Diameter | 10

Costs - Up to 10 feet Deep

	Easy	Difficult
Unpaved	2.25	2.25
Paved	2.25	2.25
Heavy Traffic		

Cost per each VF > 10 ft

Record 2 of 2 | View Mode | Ready...

2. Enter the pipe diameter in inches in the field provided. This is required in order to save the record.

3. Record the cost per foot to perform the rehab task in this record on each of the following pipe classifications (for pipes up to 10 feet deep):
   - Easy Access/Unpaved Pipes
   - Difficult Access/Unpaved Pipes
   - Easy Access/Paved Pipes
   - Difficult Access/Paved Pipes
   - Easy Access/Heavy Traffic Pipes
   - Difficult Access/Heavy Traffic Pipes

   Note: Pipes are assigned to these categories using the parameters established in the Accessibility and Surface Types setup modules.

4. For pipes at a depth greater than 10 feet, use the field provided to record the cost per vertical foot to perform the rehab task in this record. The model will use the pipe's average depth when calculating this cost.

5. Click 🖫 to save the record.

6. Click ❌ to exit **Add Mode**.

7. Click 🗗 to close the window.

8. You can then use the functions in the grid to **View**, **Edit**, and **Delete** records as needed.

PWD Diameter Cost

Default Rehab Work Tasks

PWD Pipe Default Rehab Work Tasks

Default Rehab Work Tasks

PWD Default Rehab Work Tasks

PACP Work Tasks per Defect Tab

PACP Work Tasks per Defect Tab

You'll use the PACP Work Tasks per Defect grid to add additional selection criteria to the record. These include which rehabilitation or replacement methods will be used when certain Defects are observed in a PACP Pipe Inspection record. The selection will be based on the defect's Structural rating or O&M rating. To add a Work Task per Defect record to the grid, complete the following steps:

1. Right-click in the grid and select **Add Record**. The following window will appear:

2. Click on the Defect button to select from all available sewer pipe defects (found in the Inspection Setup module). This is required in order to save the record.

3. Four Rating fields are provided. These allow you to enter the minimum observation ratings that a pipe needs to have in order to be selected for the corresponding rehabilitation or replacement work tasks. When the model is run, the system analyzes the pipe observation information to determine if the criteria established in this module are met. If so, then the Structural or O&M Tasks are selected based on the Ratings defined here.
   - Struct Rating 1 - The minimum structural observation rating required for the Struct Task 1 to be selected.
   - Struct Rating 2 - The minimum structural observation rating required for the Struct Task 2 to be selected.
   - O&M Rating 1 - The minimum O&M observation rating required for the O&M Task 1 to be selected.
   - O&M Rating 2 - The minimum O&M observation rating required for the O&M Task 2 to be selected.

4. For each defect you can choose two Structural Work Tasks and two O&M Work Tasks. These are the rehabilitation and replacement work tasks used by the model run when the identified defect is observed in a selected pipe. These pick lists come from the Rehab Work Tasks and Costs module.
   - Struct Task 1 - This structural replacement task will be selected if the minimum Struct Rating 1 is met.
   - Struct Task 2 - This structural rehabilitation task will be selected if the minimum Struct Rating 2 is met.
   - O&M Task 1 - This O&M replacement task will be selected if the minimum O&M Rating 1 is met.
   - O&M Task 2 - This O&M rehabilitation task will be selected if the minimum O&M Rating 2 is met.

5. Click 🖫 to save the record.

6. Click ✖ to exit **Add Mode**.

7. Click 🖳 to close the window.

8. To view, edit, or delete a Work Task record, simply Right-click on a listing in the grid and select **View Record, Edit Record,** or **Delete Record**.

PWD PACP Task per Pipe Defect

TV Insp Work Task Per Defect

TV Insp Work Tasks per Defect Tab

You'll use the TV Insp Work Tasks per Defect grid to add additional selection criteria to the record. These include which rehabilitation or replacement methods will be used when certain defects are observed in a pipe's TV Inspection record. The selection will be based on the defect's Structural rating or O&M rating. To add a Work Task per Defect record to the grid, complete the following steps:

1. Right - click in the grid and select **Add Record**. The following window will appear:

2. Click on the Defect button to select from all available sewer pipe defects (found in the Inspection Setup module). This is required in order to save the record.

3. Four Rating fields are provided. These allow you to enter the minimum observation ratings that a pipe needs to have in order to be selected for the corresponding rehabilitation or replacement work tasks. When the model is run, the system analyzes the pipe observation information to determine if the criteria established in this module are met. If so, then the Structural or O&M Tasks are selected based on the Ratings defined here.
   - Struct Rating 1 - The minimum structural observation rating required for the Struct Task 1 to be selected.
   - Struct Rating 2 - The minimum structural observation rating required for the Struct Task 2 to be selected.
   - O&M Rating 1 - The minimum O&M observation rating required for the O&M Task 1 to be selected.
   - O&M Rating 2 - The minimum O&M observation rating required for the O&M Task 2 to be selected.

4. For each defect you can choose two Structural Work Tasks and two O&M Work Tasks. These are the rehabilitation and replacement work tasks that will be used by the model run when the identified defect is observed in a selected pipe. These pick lists come from the Rehab Work Tasks and Costs module.
   - Struct Task 1 - This structural replacement task will be selected if the minimum Struct Rating 1 is met.
   - Struct Task 2 - This structural rehabilitation task will be selected if the minimum Struct Rating 2 is met.
   - O&M Task 1 - This O&M replacement task will be selected if the minimum O&M Rating 1 is met.
   - O&M Task 2 - This O&M rehabilitation task will be selected if the minimum O&M Rating 2 is met.

5. Click 🖫 to save the record.

6. Click ✖ to exit **Add Mode**.

7. Click 🖼 to close the window.

8. To view, edit, or delete a Work Task record, simply Right - click on a listing in the grid and select **View Record, Edit Record,** or **Delete Record**.

PWD Work Tasks Per Pipe Defect

Material Types

Material Types

The **Sewer** module provides you with a modeling program for sewer rehabilitation. This program centers around the model runs. Several setup modules are provided to help you configure your model runs. Here, you can indicate the type of materials used in the pipe wall and assign a classification to that material. The system will use the settings here to select pipes for rehabilitation and help determine rehab costs. For more information on the model runs, please reference the Sewer Rehab Model help guide.
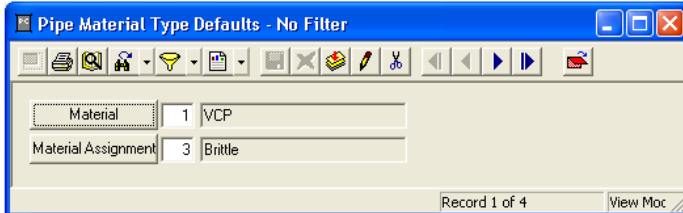
Module Toolbar

For more information about the tools available in this module go here.

Note: Users can view any field definition by **right clicking** + **Ctrl** in that field.

To access the **Material Types** module, select **Sewer > Sewer Rehab > Rehab Setup > Pipe Rehab Setup > Material Types** and the following window will appear.

Pipe Material Type Defaults - No Filter

| Material | 1 | VCP |
| Material Assignment | 3 | Brittle |

Record 1 of 4   View Moc

1. The Material pick list comes from the Pipe Inventory module. You'll use this list to indicate if the pipe wall material is VCP, Concrete, Tile, Brick, CIP, etc.

2. Use the Material Assignment field to indicate if the pipe material is Rigid, Flexible, Brittle, or Unassigned. A selection of Unassigned will force the system to assume the highest possible cost.

3. Click 🖫 to save the record.

4. Click ❌ to exit **Add Mode**.

5. Click 🖻 to close the window.

Note: The Material field is required in order to save the record.

PWD Pipe Material Type Defaults

Surface Types

Surface Types

The *Sewer* module provides you with a modeling program for sewer rehabilitation. This program centers around the model runs. Several setup modules are provided to help you configure your model runs. Here, you can indicate details about the type of surface found above the pipe. This helps determine the cost for rehabilitation. For more information on the model runs, please reference the Sewer Rehab Model help guide.

Module Toolbar

For more information about the tools available in this module go here.

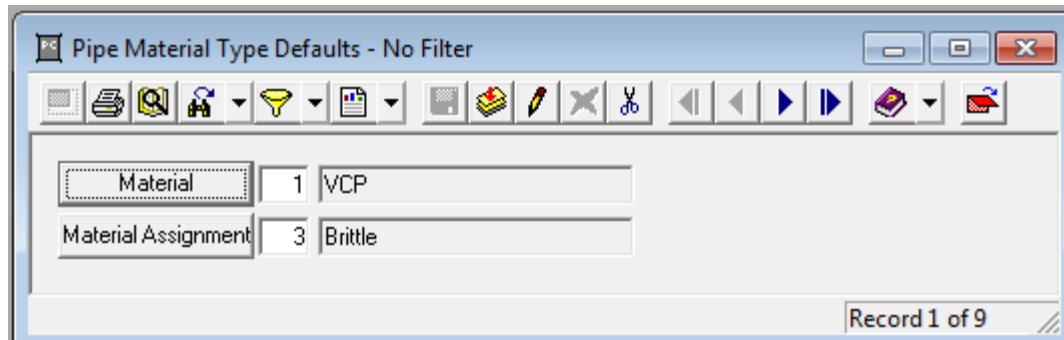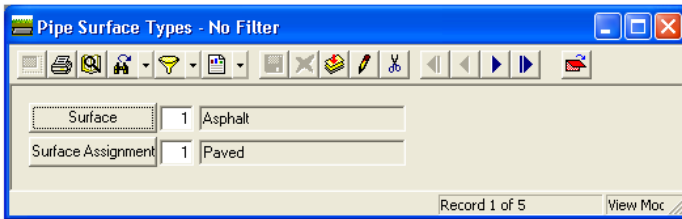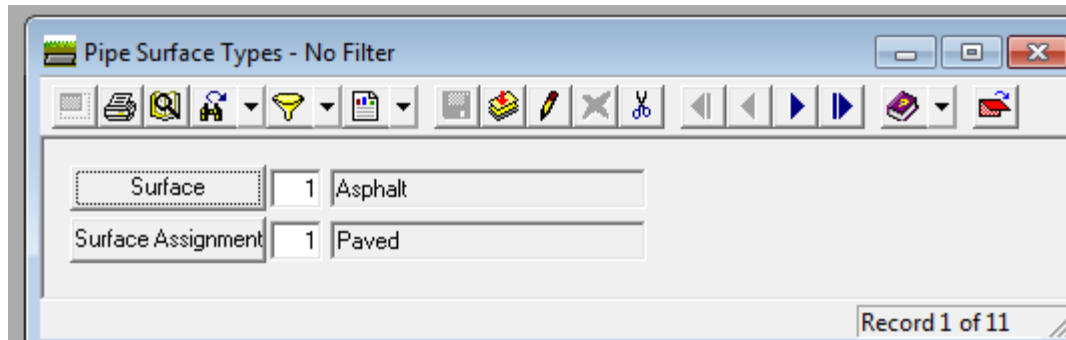**Note:** Users can view any field definition by **right clicking** + **Ctrl** in that field.

To access the *Surface Types* module, select Sewer > Sewer Rehab > Rehab Setup > Pipe Rehab Setup > Surface Types and the following window will appear.

1. The Surface pick list comes from the Pipe Inventory module. Sample pipe surfaces include Asphalt, Dirt/Grass, etc.

2. The Surface Assignment pick list allows you to indicate if the surface above the pipe is Paved, Unpaved, Heavy Traffic, or Unassigned. If you select Unassigned, the system will assume that the surface is Paved to account for the highest possible rehabilitation cost.

3. Click 🖫 to save the record.

4. Click ✖ to exit *Add Mode*.

5. Click 🖼 to close the window.

> **Note:** The Surface field is required in order to save the record.

PWD Pipe Surface Types

Accessibility

Accessibility

The *Sewer* module provides you with a modeling program for sewer rehabilitation. This program centers around the model runs. Several setup modules are provided to help you configure your model runs. Here, you can indicate the difficulty of access of various pipe locations. This can influence costs in the model runs. For more information on the model runs, please reference the Sewer Rehab Model help guide.

Module Toolbar

For more information about the tools available in this module go here.

**Note:** Users can view any field definition by **right clicking** + **Ctrl** in that field.

To access the *Accessibility* module, select **Sewer > Sewer Rehab > Rehab Setup > Pipe Rehab Setup > Accessibility** and the following window will appear.

Pipe Accessibility - No Filter	
Location	1	Street
Access Type	1	Easy
	Record 1 of 3	View Moc

1. Select the Location from the pick list. This list comes from the Pipe Inventory module. It allows you to indicate whether the pipe is found in the street, alley, easement, etc.

2. The Access Type pick list allows you to indicate whether the pipe's accessibility is Easy, Difficult, or Unassigned. If you select Unassigned, the system will assume that access is Difficult in order to account for the greatest possible cost.

3. Click 💾 to save the record.

4. Click ❌ to exit *Add Mode*.

5. Click 📋 to close the window.

> **Note:** The Location field is required in order to save the record.

PWD Pipe Accessibility
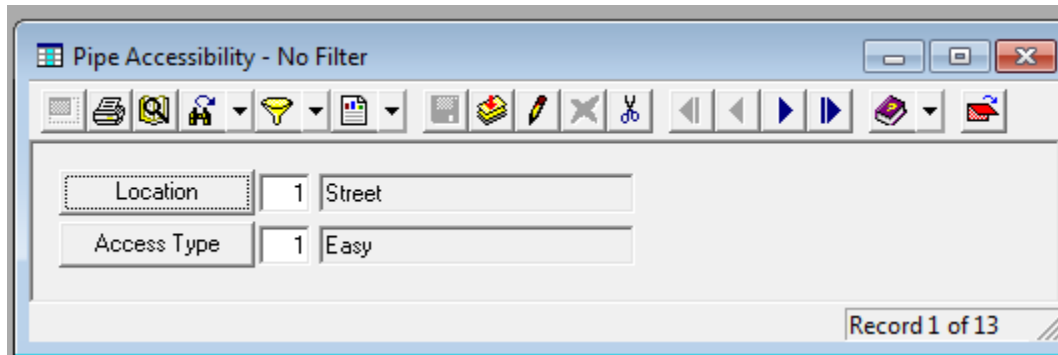
SEWER REHAB MODEL

Sewer Rehab Model

The **Sewer Rehab Model** allows you to define model run parameters, indicate which filterset the model will be run against, and run individual modeling schemes. Details from the model run are stored in the **Pipe Analysis Details** module. For additional information on these two modules, follow the links below:

Model

The *Sewer* module provides you with a modeling program for sewer rehabilitation. In order to conduct a model run, you'll need to complete the Pipe Rehab Setup. After that process you can use this module to create model run parameters, indicate which filterset the model will be run against, and run individual modeling schemes that can help you project costs, assess the system, and help determine which pipes are selected for rehabilitation or replacement. The model then displays results from the completed model runs in easily accessible tables and grids.
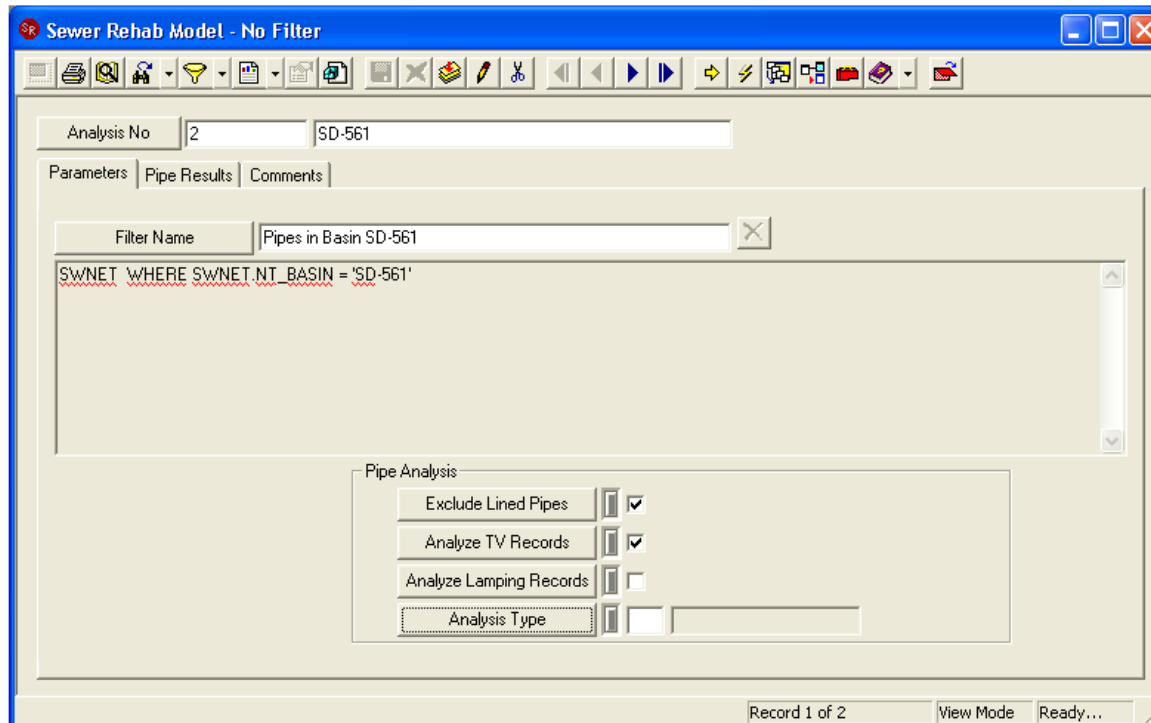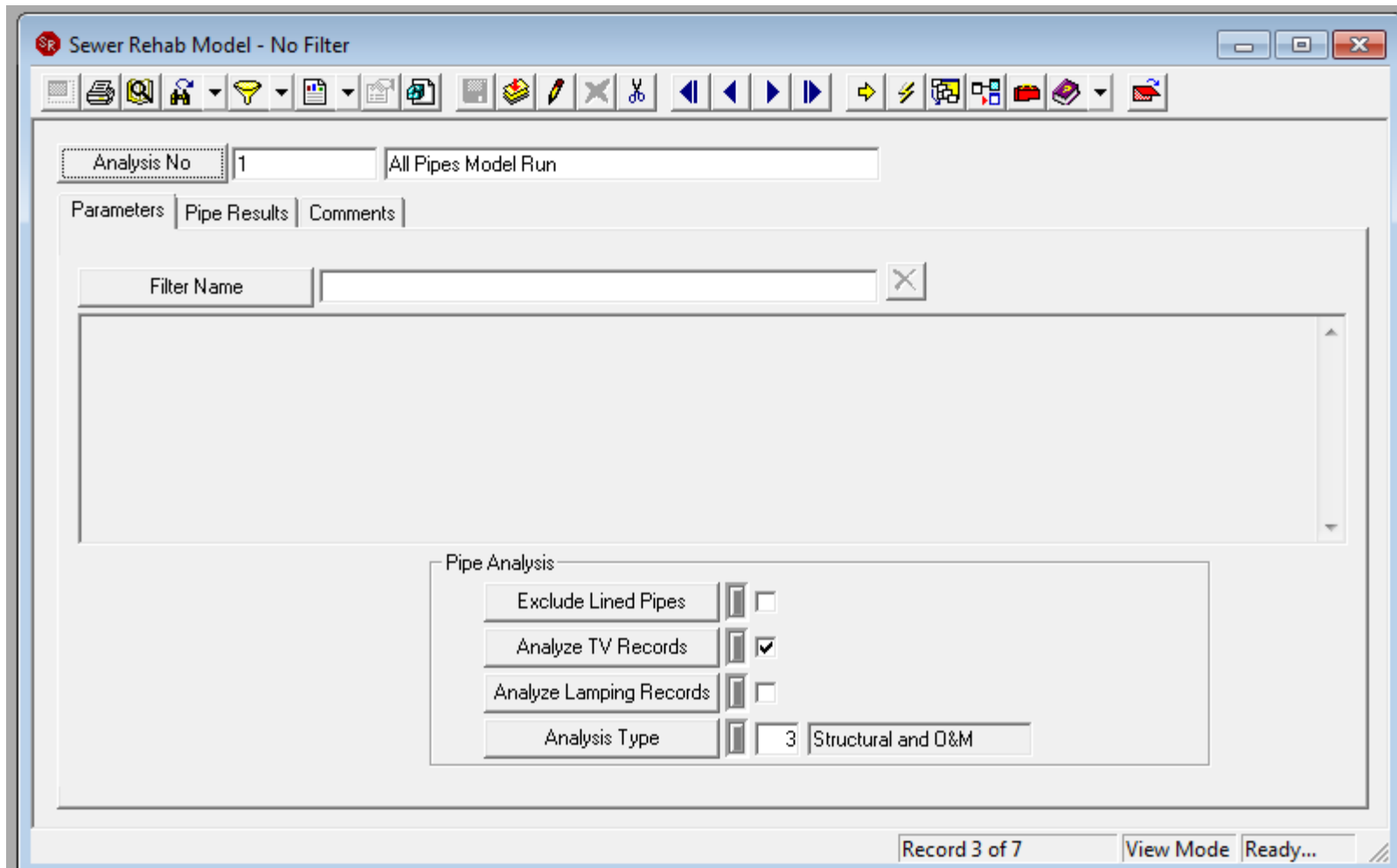
Module Toolbar

For more information about the tools available in this module go here.

Note: Users can view any field definition by **right clicking** + **Ctrl** in that field.

To access the *Sewer Rehab Model*, select **Sewer > Sewer Rehab > Sewer Rehab Model > Model** and the following window will appear.

# PWD Model

Parameters Tab

Parameters Tab

This tab allows you to indicate the modeling parameters. You can use the Filter Name fields to indicate which filterset will be analyzed during the model run. The Pipe Analysis fields allow you to indicate which pipes will be included in the model analysis. These sections are described below:

Filters

Filters help you to limit the number of records processed and focus your model on pipes of a certain type, in a particular location, etc. To include a filter, follow the steps below:

1. Click on the Filter Name button. The following dialog will appear:
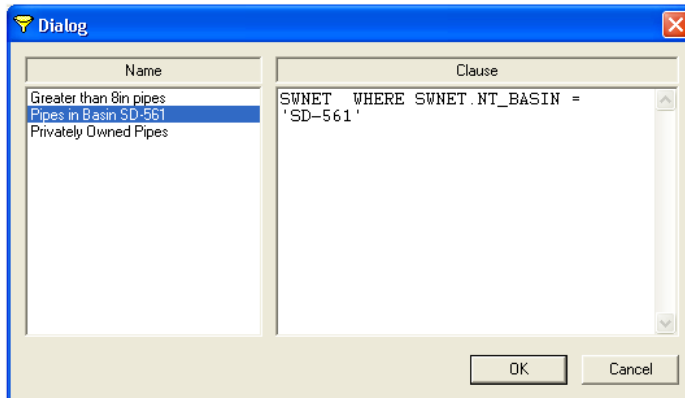
2. On the left-hand side of the dialog, you'll see a list of all available filters. This list comes from the Sewer Pipe Inventory module.

3. Highlight a Filter Name. The filter string will appear in the "Clause" grid.

4. Click **OK**. The filter string will be added to the read-only grid on the Parameters tab.

Note: You can use the ☒ button to remove a filter string from the modeling parameters.

Pipe Analysis

The Pipe Analysis checkboxes and pick list allow you to indicate which pipes will be included in the model analysis.

| Field Name	Use/Purpose
Exclude Lined Pipes	This checkbox allows you to exclude all lined pipes from the model analysis. Pipe lining is identified in the *Pipe Inventory* module, Attributes tab.
Analyze TV Records	This checkbox allows you to include TV Inspection records in the model analysis.
Analyze Lamping Records	This checkbox allows you to include Lamping records in the model analysis.
Analysis Type	This field allows you to set three separate modeling runs using Structural Only analysis, O&M Only analysis, or Structural and O&M analysis. The default Analysis Type is 3 - Structural and O&M. **Note:** The model analysis will look at the Structural and O&M observation data from the *TV Inspections* or *PACP Inspections* modules. When an inspection record is entered, the system will determine if it is the most recent inspection for the pipe and designate it as such. Only the most recent inspection data (whether from *TV Inspections* or *PACP Inspections*) is used.

Tool Kit Function

The Toolkit function is used for model runs. Once you have completed your model setup in the Parameters tab above and have included all necessary information in the *Model Setup* modules, you can begin your model run. Complete the following steps to use the Toolkit function to generate model run results.

1. To access the Toolkit, click the 🧰 button. The following window will appear:
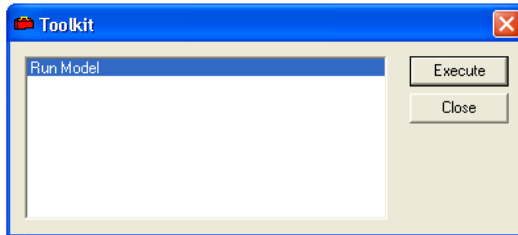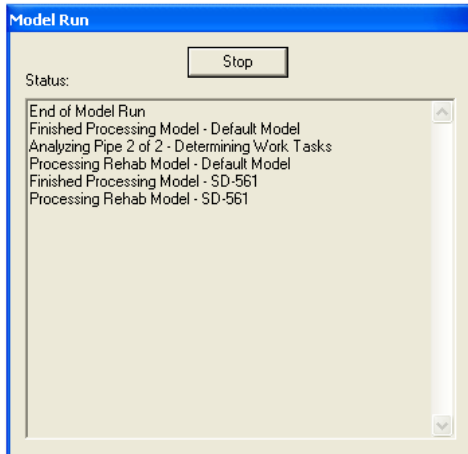

2. Select **Run Model** and click **Execute**. The following window will appear:
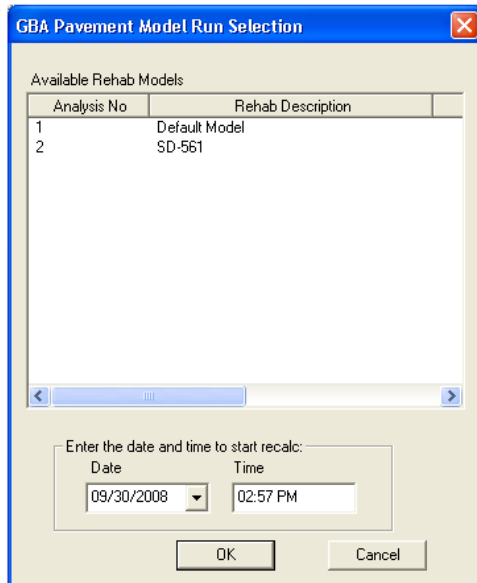
3. Select which models you wish to run from the Available Rehab Models grid.

> **Note:** You can run multiple models at the same time.

4. Enter the date and time for the system to begin the model runs. To begin immediately, press the space bar while your cursor is in the date and time fields.

Tool Kit Function

5. Click **OK** to begin the model run.

6. The following screen will appear apprising you of the model run status. It does this by continually adding the most recent activity to the top of the list. To see a history of what has been accomplished, read the list from bottom to top. When the process is complete, the notation, "End of Model Run", will appear at the top of the list.

PWD Pipe Results

PWD Pipe Results

Pipe Analysis Details

Pipe Analysis Details

The **Sewer** module provides you with a modeling program for sewer rehabilitation. When model runs have been created, the results for all pipes analyzed during the course of the model run (whether selected for rehabilitation or not) are stored here. These records are created when the model is run; thus, no **Add** button exists in this module. You will be able to edit user-entered data as needed. For further information on the model runs, please reference the Model Runs help guide.

This module will indicate if the pipe was selected for rehabilitation, it will display the rehab or replacement method recommended, it will calculate the costs for different rehab methods, and it will contain additional pipe attribute information. You'll also use this module to compare the costs to rehabilitate individual defects with the cost to rehab an entire pipe. This helps determine the best course of action for the pipes in your network.
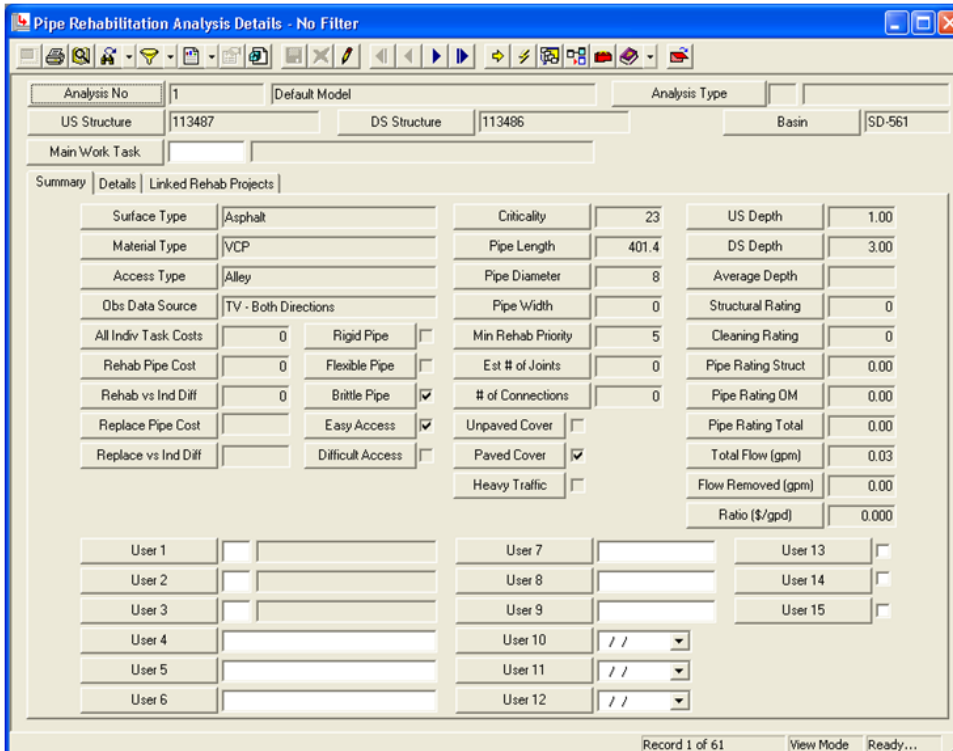
Module Toolbar

For more information about the tools available in this module go here.

Note: Users can view any field definition by **right clicking** + **Ctrl** in that field.

To access the **Pipe Analysis Details** module, select **Sewer > Sewer Rehab > Sewer Rehab Model > Pipe Analysis Details** and the following window will appear.

PWD Pipe Analysis Details

PWD Pipe Analysis Details

PWD Detail Tab

Pipe Defects

PWD Pipe Defects

Pipe Ratings

Pipe Ratings

Pipe Ratings are recorded in the Pipe Analysis Details dialog as follows:
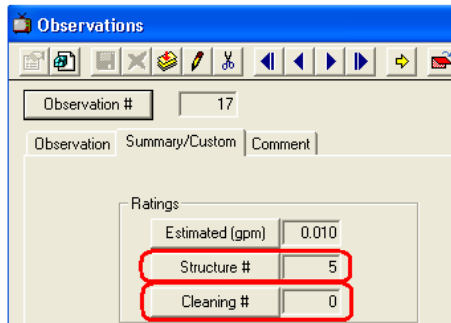
1. For PACP records, a defect can only be either a Structural defect or an O&M defect. This corresponds to the way in which observations are recorded in the PACP Inspection module.

2. For TV Inspection records, the process for assigning a rating is as follows:
   - The rating from the TV Observation will be used. In the example below, the rating is a 3.

   - The rating will be assigned either or both the Structural Rating and/or O&M Rating depending on the Structural # and Cleaning # for that defect. If either value is greater than 0, then that Rating is assigned in the Pipe Analysis Details dialog.

Pipe Work Tasks

Pipe Work Tasks

The individual work tasks are displayed in the Pipe Work Tasks grid. These correspond with any Defects selected for rehabilitation in the Pipe Defects grid.

1. Each selected task is identified by a repair number, task text, and start/stop location.
   - Start/stop locations that have different footages extend over a length of pipe.
   - Start/stop locations at the same footage indicate a point repair.
   - A sample of this grid with both types of footages can be seen below:

Repair #	Work Task	Work Task Text	Start	Stop	Selected	Cost	Rehab Proj Descr
1	03	Line Clean-Heavy Deposition	0	332	Yes	1992	
2	10	Remove Mainline Blockage	130	130	Yes	380	
3	05	Remove Roots, Clean, TV Inspect Line	0	332	Yes	2324	
4	21	Install Cured-In-Place Liner	0	332	No	17264	

2. Additionally, this grid displays the cost for each individual work task that was selected. You can choose to unselect tasks in this grid by Right-clicking on a task listing and selecting **Unselect Task**. If using the Rehab Projects module, this will serve to eliminate the work task from the **Rehab Project**.

3. The system calculates all per task costs as well as all per pipe costs (cost to rehab the entire pipe). These costs are listed on the Summary tab for comparison. These should help you determine if it's more cost effective to rehab the entire pipe or rehab it on a task by task basis.

Toolkit Function

Toolkit Function

The Toolkit functions are used to attach Pipe Analysis records to the Rehab Projects module. Complete the following steps to use the Toolkit functions.

1. To access the Toolkit, click the 🧰 button. The following window will appear:

Toolkit

Attach Current Record to Rehab Project
Attach Filter Set to Rehab Project
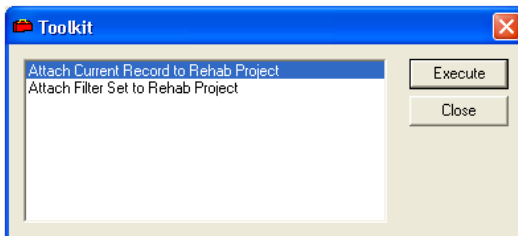
Execute
Close

2. You can use this Toolkit to either attach the current *Pipe Analysis* record or a filtered set of *Pipe Analysis* records to an existing *Rehab Project* . Highlight your selection and click *Execute*. The following window will appear:

Select Rehab Project

Description ▼	Project No	Main Work Task	Main Work Task Text
Removing Main Line B	08-00000122	104	Remove Mainline Blockage
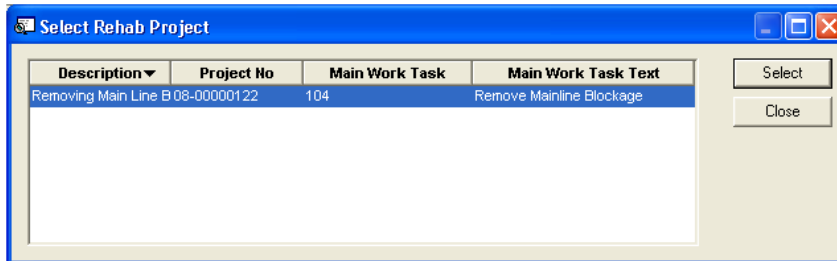
Select
Close

3. Highlight the Rehab Project to which you'd like to attach your records and click *Select*. The applicable pipes will be added to the Rehab Project's Pipes tab.

REHAB PROJECTS

Rehab Projects

The **Sewer** module provides you with a modeling program for sewer rehabilitation. This program centers around the model runs. The **Rehab Projects** module can be used to group modeling results into more manageable work projects. For example, you may create a project for work to be performed in a single basin. Alternatively, you may create a project where the same work task needs to be performed on multiple pipes in your network. For more information on the model runs, please reference the Sewer Rehab Model help guide.

Module Toolbar

For more information about the tools available in this module go here.

Note: Users can view any field definition by **right clicking** + **Ctrl** in that field.

To access the **Rehab Projects** module, select **Sewer > Sewer Rehab > Rehab Projects** and the following window will appear.

Pipes in Project

Pipes in Project

The pipes in this grid are added by the system when you run one of the Toolkit options in the *Pipe Analysis Details* module. Those options allow you to associate pipes with this *Rehab Project* module from either a single *Details* record or filtered set of records. A sample of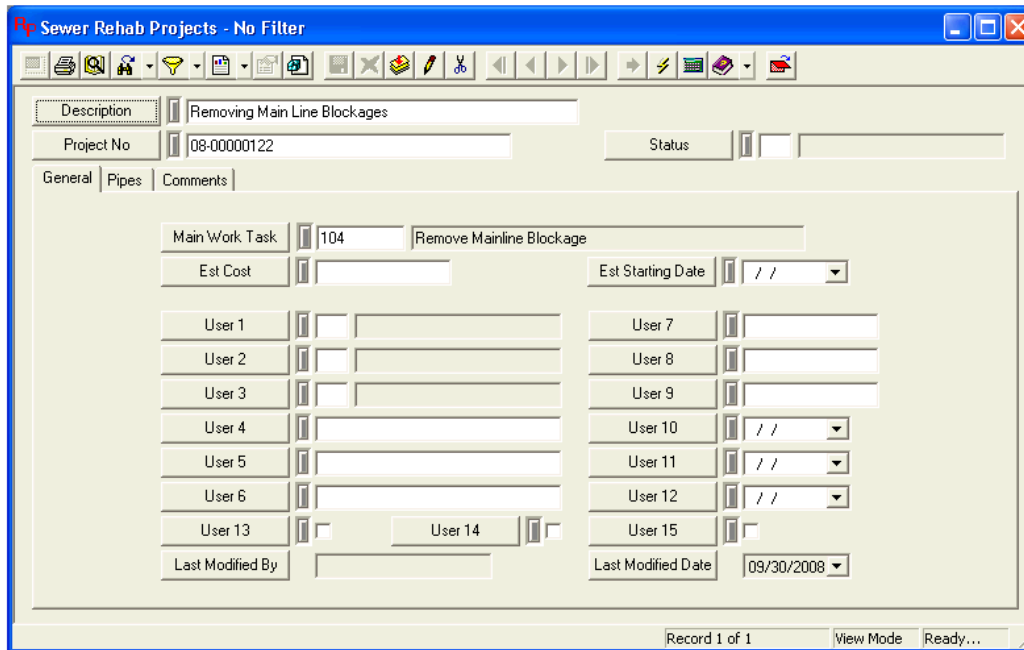 this grid appears below. As you can see, it identifies each pipe by upstream and downstream structure, address, and depth as well as pipe diameter and length.

Pipes in Project

US Structure ▽	DS Structure	US Address	DS Address	US Depth	DS Depth	Pipe Diameter	Pipe Le
127439	127437	E STOTTLER ...	E STOTTLER ...	1261.10	1261.03	10	
117610	117609	S ROANOKE ST	S ROANOKE ST	0.00	0.00	8	
117023	117022	E RANCH CT	E RANCH CT	0.00	0.00	8	
116856	119554	E SHERRI CT	E SHERRI CT	0.00	1274.58	8	
113625	113624	E TAMARISK ...	E ROBIN LN	3.64	3.20	8	
113616	113618		W GALVESTO...	1271.18	6.00	8	
113491	113494	N POPLAR CT	S QUINN CT	2.35	2.10	8	

Pipes in Project Cont.

1. To Add additional pipes to the project, or View, Edit, or Delete existing pipes, Right-click on a listing in the grid and make your selection. A window similar to the following will appear:

2. Use the fields provided to record the Estimated Cost, number of Building Taps, Pipe Length, Pipe Diameter, Surface Type, and Material Type. The Basin and Access Type information are carried over from the related Pipe Inventory record.

3. You can record custom information in the user-defined fields at the bottom of the Pipe Details tab. These fields include:
   - Code-type - User-defined, pick list fields.
   - Alphanumeric - Allows you to enter letters or numbers in any combination.
   - Check-box - Used to indicate yes/no or on/off.
   - Numerical - Accepts numeric digits only.
   - Date - Provides a popup calendar allowing you to select a date.

4. Additionally, you can record Comments on the tab provided. Simply place your cursor in the large text field and begin typing.

5. Click 💾 to save the record.

6. Click ❌ to exit **Add Mode**.
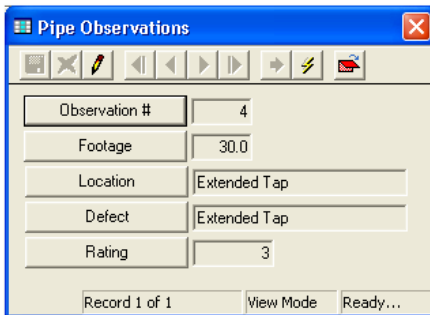
7. Click 📭 to close the window.

Pipe Building Connections

Pipe Building Connections

This grid identifies Pipe Observations for any building connections in the pipe highlighted in the Pipes in Project grid. To view a different pipe's building connections, simply click on a different pipe in the previous grid.

A sample of the Pipe Building Connections grid appear below. It identifies observations for each connection by observation number, footage, location, defect, and rating.

Obs # ▽	Footage	Location	Defect	Rating
1	5.0	Lower Left	Crack-Horizontal	3

To View or Edit Pipe Observation details, Right-click on a listing in the grid and make your selection. A window similar to the following will appear:

Pipe Observations

Observation #	4
Footage	30.0
Location	Extended Tap
Defect	Extended Tap
Rating	3

Record 1 of 1   View Mode   Ready...

Pipe Individual Rehab Items

Pipe Individual Rehab Items

This grid identifies individual rehab tasks for the pipe highlighted in the Pipes in Project grid. To view a different pipe's rehab tasks, simply click on a different pipe in the previous grid.

A sample of the Pipe Individual Rehab Items grid appear below. It identifies tasks by repair number, task code, and task text. It also indicates whether the task was selected by the model run, the pipe's start and stop footage, pipe length, and estimated task cost.

Note: Only the rehab work tasks that were selected in the Pipe Analysis Details module will appear in the **Project** record.

Repair #	Work Task	Work Task Text	Task
1	104	Remove Mainline Blockage	Yes
2	102	Remove Roots, Clean, TV In...	Yes
3	105	Line Clean-Heavy Deposition	Yes

Pipe Individual Rehab Items Cont.

1. To Add additional work tasks to the project, or View, Edit, or Delete existing tasks, Right-click on a listing in the grid and make your selection. A window similar to the following will appear:


2. Use the fields provided to record the Repair #, Start and Stop footages, pipe Length, and Estimated Cost.

3. The Work Task field allows you to select a Rehab Task from the pick list. This list comes from the Rehab Work Tasks and Costs module.

4. The Task Selected checkbox is used to indicate if the work task was selected in the model run.

5. You can record custom information in the user-defined fields at the bottom of the dialog. These fields include:
   - Code-type - User-defined, pick list fields.
   - Alphanumeric - Allows you to enter letters or numbers in any combination.
   - Check-box - Used to indicate yes/no or on/off.
   - Numerical - Accepts numeric digits only.
   - Date - Provides a popup calendar allowing you to select a date.

6. Click 🖫 to save the record.
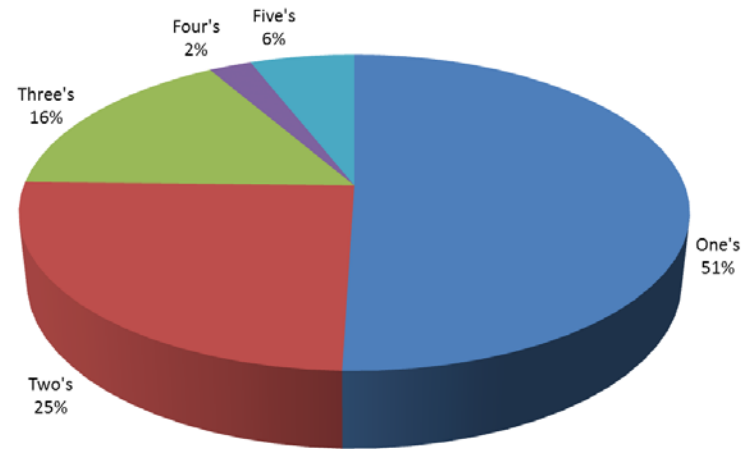
7. Click ❌ to exit *Add Mode*.

Sewer Rehabilitation Results

Total Number of Structural Rating Items
Prior to Staff Evaluation - 824

Distribution of Structural Ratings by Percentage

- One's, 416
- Two's, 205
- Three's, 134
- Four's, 20
- Five's, 49
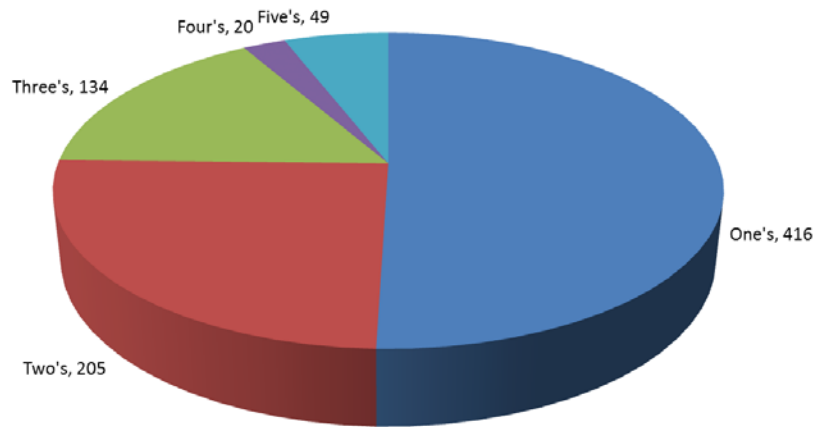
Distribution of Structural Ratings by Amount

- One's 51%
- Two's 25%
- Three's 16%
- Four's 2%
- Five's 6%

Demo

- Costs
- Map
- Projects

Demo

- [Cost Sheet All Structural Defects](#)
- [Cost Sheet Only #5 Structural Defects](#)
- Costs
- Map
- Projects