



ACT 2016 – Orlando, FL

Work Performance Evaluation and Work Planning Case Study

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PW Annual Plans (FY) X

PW Annual Plans (FY/section/category) - 2016 - WASTEWATER COLLECT

Planning Tasks 100

	Section Name	Work Task	Work Task Description	Inventory	Asset/Feature	Annual Work Qty	Work Unit	Plan Avg Daily Prod	YTD Work Qty	Plan Days	YTD Days	Plan Units/Hour
+	WASTEWATER COLLECT	0802	JET RODDING	350	Linear Miles	958650	Linear Feet	1439.00	40925.2	1332.38	27.88	89.94
+	WASTEWATER COLLECT	1104	LIFT STATION MTCE	63	Lift Stations	2249	Each	7.47	81.0	602.09	11.25	0.47
+	WASTEWATER COLLECT	2508	EQUIPMENT MTCE - SPECIALTY SEWER	8	Equipment	1008	Each	8.00	84.0	252.00	10.50	0.50
+	WASTEWATER COLLECT	0101	SUPERVISION	12	Persons	1800	Hours	8.00	8.0	225.00	9.50	1.00
+	WASTEWATER COLLECT	0805	REPAIR MAIN LINE	400	Linear Miles	83	Repairs	0.88	6.0	282.27	9.44	0.04
+	WASTEWATER COLLECT	1102	LIFT STATION CLEAN	63	Lift Stations	279	Each					

Tuesday, September 13, 2016

10:00am-11:50am

John Gamble – Volusia County (FL)

Billy Wright – LA Consulting (CA)



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Agenda

- 1. Ideal Maintenance Management***
- 2. Work Planning***
- 3. System Demonstration***

***A lot of information in a brief presentation...
Interrupt me anytime. I'll redirect if needed.
Q&A to review specific items.***

Introduction

- Billy Wright
- CSU Long Beach (MIS) → LA Consulting (2005)
- Continuous Improvement Focus

LAC Client Functions Include:

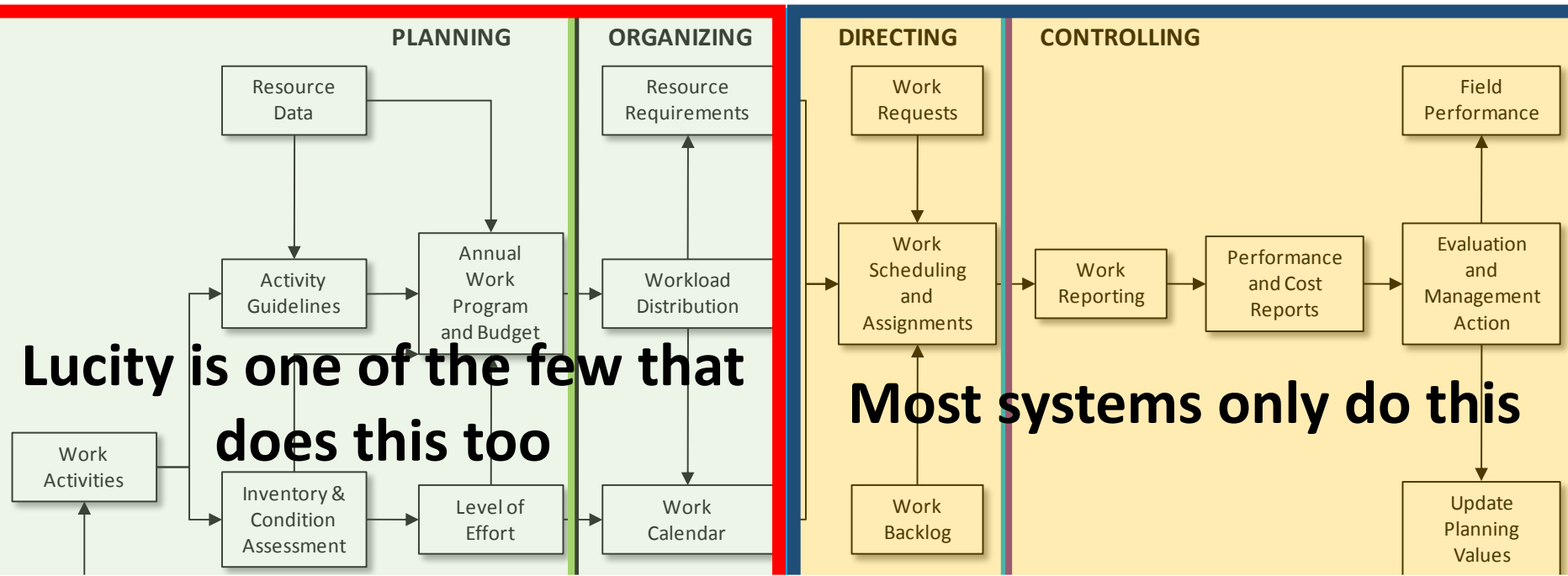
- Sewer (Pretreatment, Collection, Treatment)
- Water (Production, Distribution, Water Quality)
- Streets (Pavement, Concrete, Right-of-Way)
- Traffic (Signs, Markings, Signals)
- Storm / Drainage
- Facilities
- Parks
- Solid Waste / Landfill



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Ideal Maintenance Management Process

APWA Administration Manual 2008



Do you want to show what you need?

Demonstrate your competitiveness?

This can pay for your system and make the Boss look good too!

Managing Efficiency

Inputs / Costs

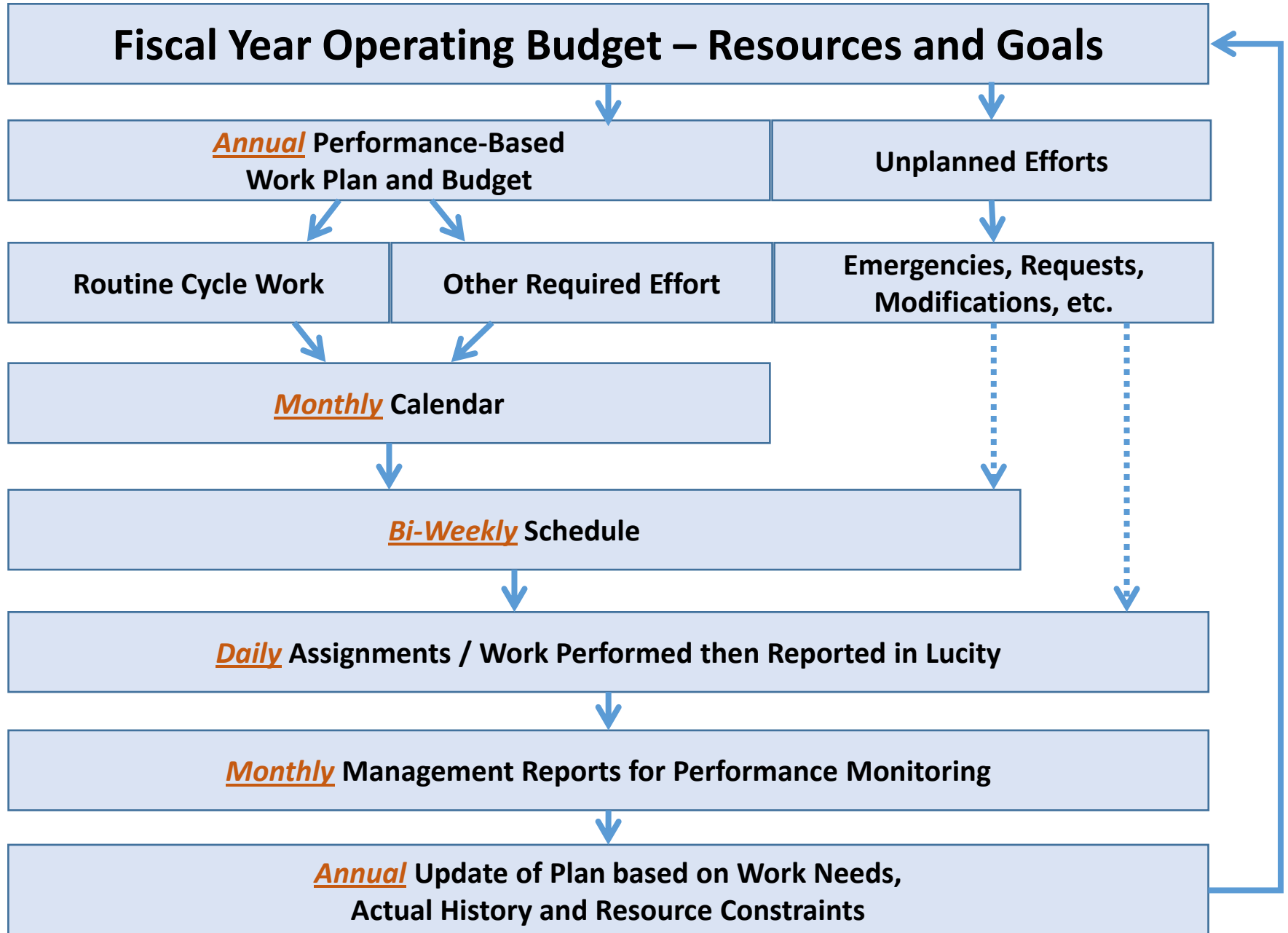
- Labor
- Equipment
- Materials
- Contracts
- Capital Plan
- Transfers
- Overhead
- *Hours / \$\$\$*

Outputs / Results

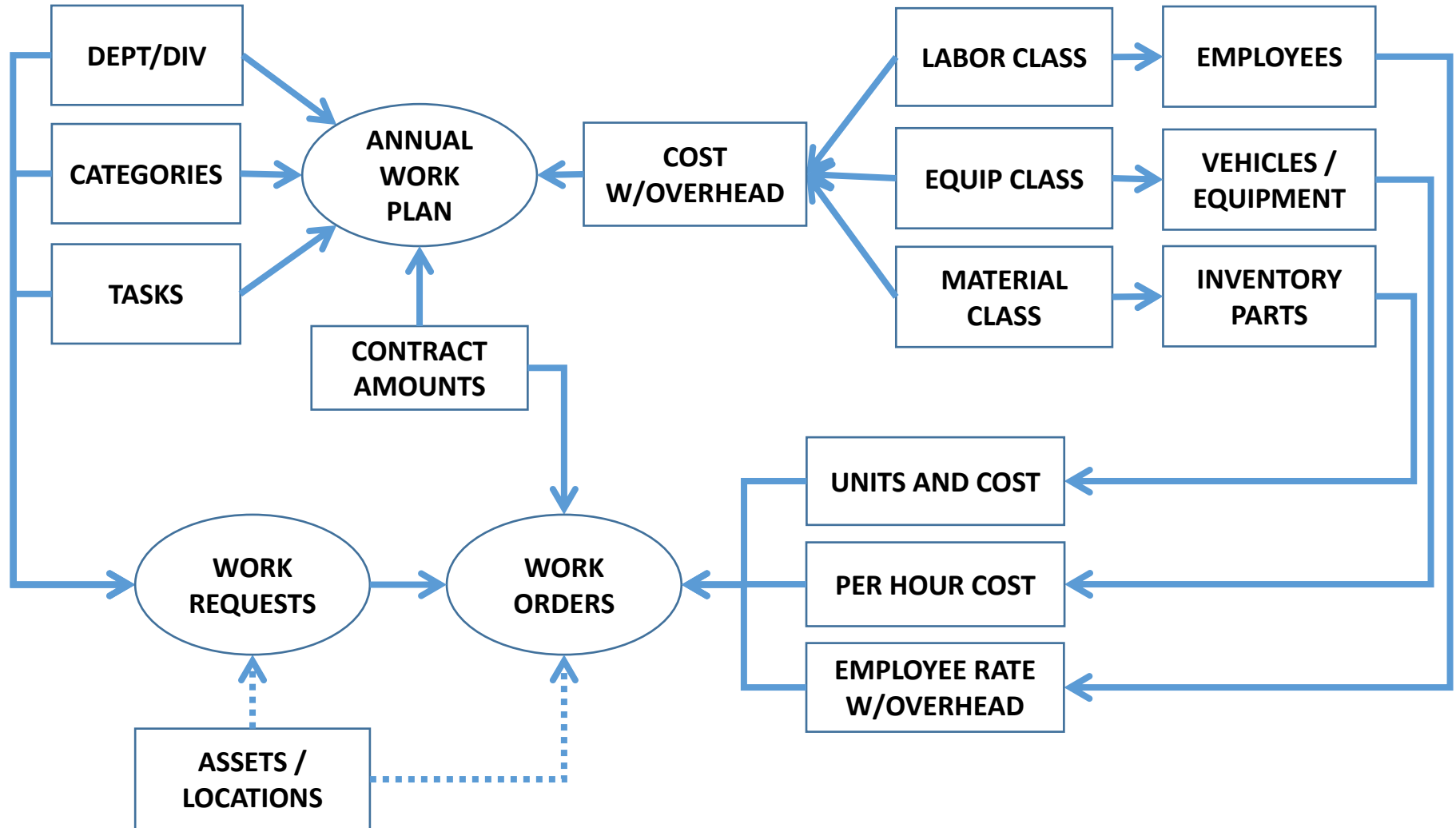
- Construction / Installation
- Operation / Monitoring
- Maintenance / Routines
- Repair / Rehab
- Supervision
- Administration
- Reporting
- *Work Accomplishment*

Can't manage what you don't measure...
Get the most 'bang for your buck' by increasing output volume with the available inputs...

Annual Update Process – Continuous Improvement



Lucity Database



Budget and Cost

Total Cost

- Labor
- Equipment
- Materials
- Contracts
- Capital
- Transfers
- Overhead
 - **Full**
 - **Avoidable**

Lucity Costing

- Direct labor rate
- Hourly usage rate considers actual usage, fuel, mtce, & replacement if not included in OH
- Direct cost in Lucity
- Direct cost in Lucity
- Not charged; resources are reported instead
- Not reported in Lucity; possibly OH
- Applied to labor; accounts for indirect costs
 - **For billing (includes all fixed costs)**
 - **For comparison; costing maintenance work in Lucity; avoidable cost only**
 - Benefits, training, support, supervision,
 - Small tools, uniforms, supplies, transfers, etc.

Everything is accounted for only once.

Avoid double-counting items if also tracking in Lucity.

Task Guidelines

ACTIVITY GUIDELINE MAINTENANCE PLANNING SYSTEM

WORK ACTIVITY	CCTV	PROGRAM CODE	0811
DESCRIPTION OF WORK			
All work associated with the televised inspection of new and existing main sewer lines. Work is done to identify infiltration, exfiltration, illegal connections, lost & unused connections, lost or unmapped manholes & cleanouts, causes of blockage, possible pretreatment concerns, and other structural problems.			
LABOR DISTRIBUTION	JUL	AUG	SEP
PLANNING CRITERIA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Work is done on a request basis, as identified by personnel in the field, and as follow up to SSO reports.			
RESOURCE REQUIREMENTS	WORK METHOD		CHECK POINTS
Employee	Quantity		1. Review daily assignment sheet for work assignment. 2. Conduct pre-trip vehicle and equipment inspection. 3. Load all necessary equipment and materials. 4. Proceed to the work location. 5. Set up van at upstream manhole and establish traffic control as necessary. 6. Start Generator. 7. Set up camera wheels for appropriate diameter of pipe. 8. Clean camera lens. 9. Lower camera into channel. 10. Set up down roller, and top roller when needed. 11. Reset counter in back of van. 12. Complete start up sequence inside van. 13. Set up computer with accurate information for inspection report. 14. Proceed with CCTV inspection, and record defects
UTILITY WORKER	8		
SR UTILITY WORKER	8		
Equipment	Quantity		
CAMERA VAN	8		- Wear proper PPE. - Bring 27" traffic cones for high volume traffic setups. - Request cleaning for line segments where blocked by grease or debris. - Request all newly found manholes, and cleanouts be marked with carsonite markers.

← Task Code/Name

← Activity Description

← Planning Criteria

← Resource Requirements

← Work Method

← Check Points

This is the foundation of work planning and the basis for evaluating improvement.

22. Perform shutdown sequence in camera van.	
23. Remove traffic control.	
24. Complete appropriate paperwork.	
25. Clean and refuel vehicle.	
26. Update section maps with accurate footage, and unmapped manholes.	

← Quality / Results

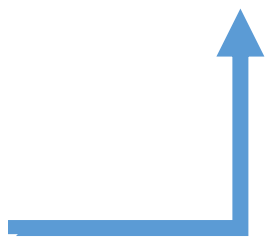
← Asset Inventory

← Average Daily Production (ADP)

QUALITY - RESULTS	
Illegal connections will be identified, infiltration will be identified for elimination, repeat blockages will be avoided, needed repairs will be accurately located, and previously lost manholes will be found.	
ASSET INVENTORY ITEM - UNITS	EFFECTIVE
400 Linear Miles	
AVG. DAILY PRODUCTION - UNITS	APPROVAL
577 Linear Feet	

Work Planning Variables

Each task work plan contains:

- Task Description **SIGN MAINTENANCE**
 - Feature / Asset Inventory **15,000 SIGNS**
 - Effort Level / Annual Quantity **0.150** **2,250 SIGNS**
 - Average Crew Size **1.5**
 - Average Daily Production **15.8**
- 

Actual work reporting history in Lucity can be used as a guide.

Annual Work Plan

Activity

TREE TRIMMING

Qty Per Unit

(effort level)

0.185

Crew Size

4.0

Annual Cost

\$163,471

Inventory

7,200 trees

Work Qty

1,332 trees

Average Daily Production

16 trees

Labor Days

333 days

Unit Cost

\$122.73

Budget Work Plan R

FISCAL YEAR: 2016

CATEGORY: 4.40.01 - AD

0101 SUPERVISION

0102 MEETINGS

0103 TRAINING

0104 INSPECTION / WALKTHRU

CATEGORY: 4.40.08 - SEWER LINE MTCE

0801 MECH RODDING

0802 JET RODDING

0803 EASEMENT RODDING

0804 JET RODDING AND VAC

0805 REPAIR MAIN LINE

0806 SEWER LINE TAP

0807 SSO REQUEST INVESTI

0808 SSO CLEANUP

0809 SMOKE TEST

0810 DYE TEST

0811 CCTV

0812 CCTV NEW SYSTEM INS

CATEGORY: 4.40.10 - MANHOLES

1001 RAISE/REPL RING & COVER

1002 CLEAN OUT MANHOLE

1003 REPLACE MANHOLE

1004 MANHOLE INSPECTION

1005 INSTALL NEW MANHOLE

6/3/2015

8:37 AM

ADF

Equipment

Material

Total

12 Persons

150.00

1,800 Hours

8

225.00

8.00

225

44,334

0

0

44,33

273 Hours

8

34.13

8.00

34

10,708

0

0

10,73

805 Hours

8

75.63

8.00

76

23,731

0

0

23,72

0

0

0

0

0

0

5

78,773

0

0

78,78

750

2

3,862

4,296

0

8,15

650

2

439,580

488,931

0

928,51

750

2

190,762

175,175

0

365,93

400 Linear Miles

53.02

16.00

106

34,984

38,912

0

73,89

400 Linear Miles

94.32

24.00

283

93,352

110,647

0

203,50

12,000 Connections

6.00

16.00

12

3,959

1,667

0

5,62

near Miles

10.86

0

15,29

near Miles

13.09

0

9,73

near Miles

0.00

0

near Miles

3.00

0

4,30

near Miles

314.73

0

295,09

near Miles

1.00

0

51

Category Total

3,036

932,297

910,335

0

1,910,56

83 Each

116

38,298

48,753

0

86,84

94 Each

36

11,928

13,267

0

25,08

0 Each

0

0

0

0

61 Each

29

9,658

1,224

0

10,86

3 Each

13

4,147

7,564

0

14,05

- Estimated accomplishment for each activity on an annual basis.
- Balance to the available resources

Resource Availability

What do you have?

For each employee:

- 80 hours per pay period
- 26 pay periods per year
- 2,080 annual hours for one FTE (with holidays)
 - $80 \times 26 = 2,080$
- Hours not tracked in Lucity (holiday, leave, etc?)
 - Assumed 112 for demo
 - 1,968 available hours per FTE ($2,080 - 112$)
- 9-hour shift (could be 8, 10, etc.)
 - 219 days per FTE ($1,968 / 9$)

Annual plan should be balanced to available resources.

Work Distribution / Work Calendar

<u>Work Qty</u>
1,332 trees
<u>Labor Days</u>
333 days
<u>Annual Cost</u>
\$163,471



JAN – FEB – MAR – APR – MAY – JUN – JUL – AUG – SEP – OCT – NOV – DEC

ANNUAL PLAN	%	%	%	%	%	%	%	%	%
Labor Days	28	28	28	28	28	28	28	28	28
Work Units	111	111	111	111	111	111	111	111	111
Resource Requirements	#	#	#	#	#	#	#	#	#
Dollars	\$13,623	\$ 13,623	\$ 13,623	\$ 13,623	\$ 13,623	\$ 13,623	\$ 13,623	\$ 13,623	\$ 13,623

**Annual Plan is Distributed on a Monthly Basis.
Labor Days, Work Units, Resources...**

PM / Work Templates

- Routine tasks performed at specific, pre-determined intervals
- Break down of annual plan into manageable work loads
- Automatic generation of work orders

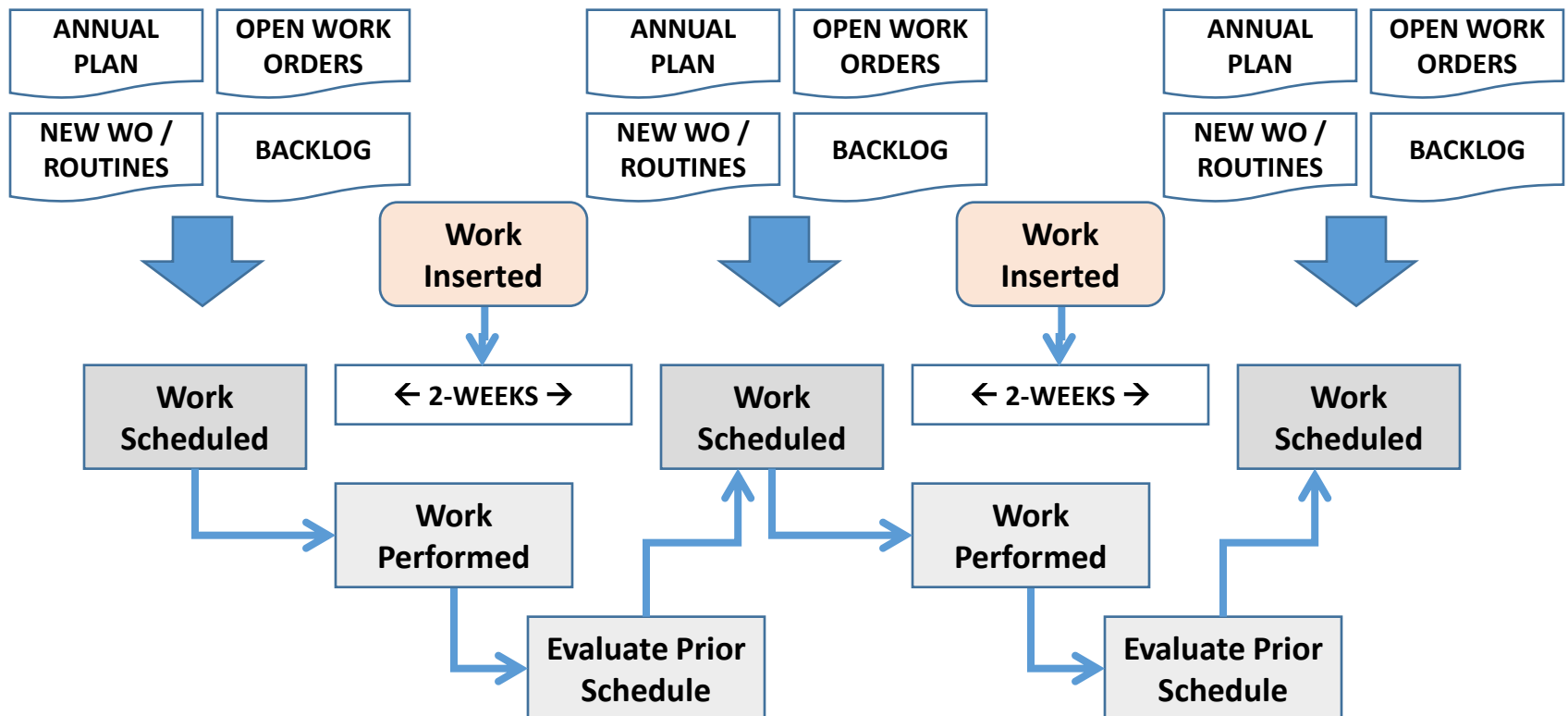
The screenshot displays the 'PM/Work Template - BW_facbldg_templates' window. The form is divided into several sections:

- Header:** PM/Template FM002 Facilities Custodial - Group2
- Category:** 8.20 FACILITY BUILDINGS
- Main Task:** 8070 FACILITIES CUSTODIAL
- Problem:** F-003 Custodial
- Scheduling Options:** Scheduled PM (checked), Grouped PM (unchecked), Inactive (unchecked), Tightly Linked PM (unchecked), Grouped Assets (unchecked).
- Tabs:** WO, Location, Assets, Checklist, Tasks/Resources, Scheduling WOs, Grouped PMs, Related WOs, Billing, WO Custom, Tracking, Custom, Comments.
- Scheduled PM Activity:**
 - Last Start Date: 06/01/2015
 - Interval: 2 Months
 - Next: 08/01/2015
 - Days Ahead: 1
 - Est Duration (in Days):
 - Last End Date: / /
 - Meters Ahead:
 - Previous Odometer:
 - Previous Hourmeter:
 - Previous Other:
 - Status:
 - WO Number:
 - Initiated Date: / /
- Affected or Tightly Linked PMs:** A table with columns: Code /, # Between, # Remain, Routine Text.
- Exclusion Days:** A table with columns: Day, Start Range, End Range, Work Day?, Seasonal.

At the bottom, it shows 'Record 1 of 9', 'View Mode', and 'Ready...'.

Work Scheduling Procedures

- Driven by Annual Plan and Monthly Work Calendar
- Other unplanned work will occur (emergencies, requests, etc.)
- Define emergencies – Schedule the rest (~26 times/year)



Monitoring and Controlling

- Monitor productivity and cost on a periodic basis for each task
- Identify trends before they develop into problems

2010 RETENTION AREA MAINTENANCE Acres

2000	DITCH INSPECTION SURVEY		Ditch Mile	80.0	77.0	800.0	187,827.7	\$30,362	\$31,764	1.00	243.93	\$41.70	\$0.17	80.0	77.0	96	800.00	187,827.7	23,478
2010	RETENTION AREA MAINTENANCE		Acres	570.0	531.1	1,500.0	1,449.4	\$151,578	\$159,401	0.26	0.27	\$101.05	\$109.98	570.0	531.1	93	1,500.00	1,449.4	97
2201	AQUATICS SPRAYING		Acres	0.0	0.0	0.0	0.0	\$0	\$0	0.00	0.00	\$0.00	\$0.00	0.0	0	0	0.00	0.0	0
2202	Labor Days		Quantity						Total Cost \$										
2203																			
2205																			
2206																			
2301	Plan Actual		Plan Actual						Plan Actual										
2302																			
2303	570.0 531.1		1,500.0 1,449.4						\$151,578 \$159,401										
2304																			
2306	MECHANICAL CLEAN DRAINAGE BOX		Each	24.0	3.8	72.0	11.0	\$16,372	\$2,379	0.30	0.31	\$227.36	\$216.21	24.0	3.8	16	72.00	11.0	15
2307	HAND CLEAN DRAINAGE BOX		Each	73.4	45.4	2,202.0	674.5	\$22,679	\$17,825	3.00	1.49	\$10.39	\$26.13	73.4	45.4	62	2,202.00	674.5	31
2309	PIT OPERATION		Hours	178.3	266.8	1,783.0	2,668.0	\$154,902	\$295,902			\$87.06	\$110.91	178.3	266.8	151	1,783.00	2,668.0	151
2311	DITCH CLEANING MECHANICAL NO HAUL		Unit per Hour				Unit Cost \$				\$2.79	82.3	67.1	196	37,856.00	37,533.1	99		
2312	DITCH CLEANING MECHANICAL - HAUL										\$5.09	350.2	490.3	137	61,806.00	67,969.0	110		
2313	CHEMICAL DITCH MAINTENANCE										\$1.69	194.8	116.5	71	659.00	352.2	53		
2315	ROW MOWING FLAT										\$0.06	159.4	97.5	81	956,430.00	1,015,452.2	106		
2316	ROW MOWING SLOPE										\$0.77	120.0	167.9	140	72,000.00	143,808.8	200		
4102	ASPHALT PATCH-MECHANICAL										\$4.93		10.0	0	0.00	13.6	0		
4106	INSTALL CATCH BASIN / INLET										\$6.40	83.2	87.8	106	25.00	13.0	52		
4107	INSTALL MAJOR STORMWATER STRUCTURE										\$0.00		0.0	0	0.00	0.0	0		
4202	EQUIPMENT HAULING										\$75.07		23.8	0	0.00	237.8	0		
4205	HAULING MATERIALS TON		Load	109.3	55.1	437.0	195.0	\$66,227	\$56,517	0.40	0.35	\$201.87	\$289.83	109.3	55.1	50	437.00	195.0	45

General Monthly Review Process

SCRUB DATA



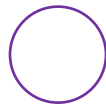
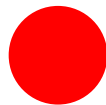
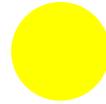
**CONFIRM ACCURACY AND
COMPLETENESS**



**EVALUATION BY SUPERVISORS
TO PREPARE FOR MEETING**



**MEETING WITH MANAGER TO
EXPLAIN PERFORMANCE
RESULTS**

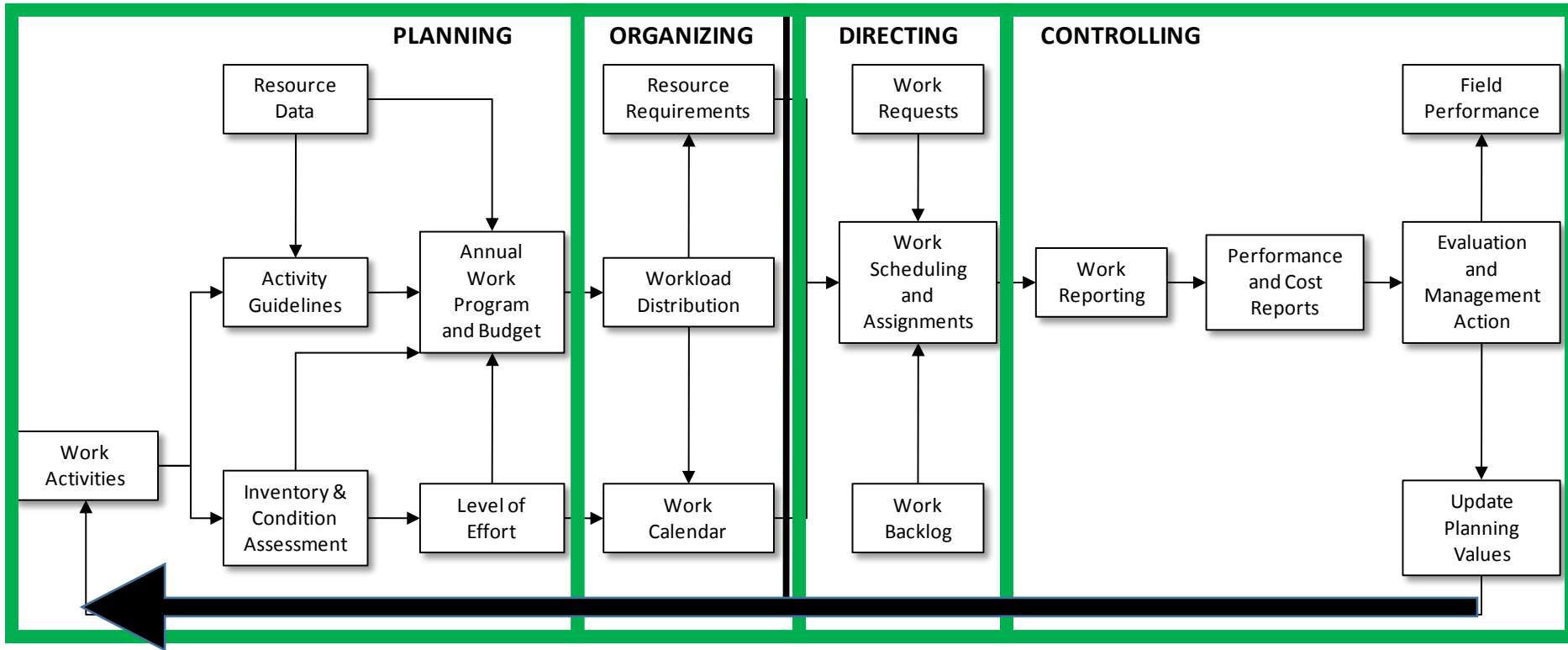


September 2016						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5 Labor Day	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

What Am I Looking For?

- Did We Do What We Planned?
- Realistic Planning Values
- Accurate Reporting of Resources
- Work Accomplishment Tracking
- Was Work Scheduled Efficiently?
- Does Task Description Represent Actual Work?
- Work Methods/Quality
- Production
- Unit Cost

Ideal Maintenance Management Process



Goal is to help employees help themselves...
Continual Improvement!

Questions?



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Break, then Demo...

