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December 28, 1992

Subject: Kalamazoo Department of Utilities Report #1

To: Kenneth P. Collard, P. E. - Director DPU

Project: 92:52

Disk #: 339

Date of meeting: Friday, December 18, 1992 (wd 503)

Those attending: Some in meeting part time only

- Kenneth P. Collard, P. E. - Director of Utilities
- Bruce Minsley - Deputy Utilities Director
- Frank Szopo, P. E. - Acting City Engineer
- Jerri Barnett-Moore - Finance DPU
- Ralph J. Stephenson, P. E. - Consultant

Actions taken:

- Reviewed current projects and programs of the Department of Utilities
- Discussed items of management interest to DPU
- Prepared mis decision tree analysis with Mrs. Barnett-Moore
- Began review of merged DPU and DPW engineering functions and projects with Mr. Szopo.

General summary:

This was the initial management meeting with the Department of Utilities staff. The work objectives for these meetings are generally as set out in my letter of October 14, 1992 to Mr. Collard on the subject of *Technical and management considerations in modeling the futures of Kalamazoo's public works program.*

Major efforts at this initial meeting were focussed on the subjects of most importance, and on testing some of the assumptions to be made in our upcoming work.

A general summary of the meeting is given in the attached *Kalamazoo Department of Utilities notes.* These include main headings labeled A through I. A brief description and commentary is given below:

- Sections A, B, C and D - Meeting description, date and attendance.

Routine information.

- Section E - Agenda

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I suggest we prepare an advance agenda for each meeting. This is important since the people involved are key people and in high demand. I shall forward a suggested agenda to Mr. Collard prior to each meeting for use as a guide to material to be covered.

As items on the agenda are addressed they will be checked (√) and moved to the bottom of the list. This encourages a carry over of unfinished agenda items to the following meeting.

• **Section F** - Management discussions

This section contains a review of our discussions of general and specific interest to staff members in the meeting. The comments have been edited by me and therefore should be checked for accuracy and appropriateness.

At meeting #1, we attempted to identify the general direction in which to move with our management work so as to be intelligently consistent with demands on DPU staff time, and their perceptions of priority work.

Comments under F1a), F2), F3a), F3b), and F4a) offer sizable opportunities for future management discussions relative to adding value to the DPU program. Section F5e) and F5f) are, in essence, a list of the specific program and project work that the staff themselves have identified as appropriate for further management discussion.

• **Section G** - Definitions

These definitions are of terms that seemed to require clarification or explanation in our discussions. The definitions marked *rjs* are those defined by me as projected from our meeting. They should all be checked for accuracy.

• **Section H** - Abbreviations

In the interest of brevity, and particularly when computer coding of entries to a data base are used, I have begun a list of abbreviations commonly used in our discussions. This will be updated as new abbreviations are added.

• **Section I** - Those involved

This listing is primarily for my benefit since I am not at present totally familiar with all the people and organizations involved in the Kalamazoo DPU effort. The list should be of help as we begin to define the various kinds of management relationships to be established and maintained among the parties.

* * * * *

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Also enclosed is a decision tree analysis of possible courses of action to be taken in evaluating the City's management information system. This document is labeled Sheet #DT 1, issue #1, dated December 18, 1992. It was prepared with Mrs. Jerri A. Barnett-Moore during our meeting. A copy was given her at that time. I have made some minor editing corrections, and suggest you ask her to replace her copy with this new model.

The decision tree shows various courses of action that might be followed leading to an end of the sequence. No judgment of the relative merit of a course of action is made in preparing the decision tree. The possible sequences are later rated for final selection.

There are probably several other branches possible to follow in this decision tree, and I suggested to Mrs. Barnett-Moore that she use the Post It technique to explore these.

I should like to suggest we address the following items in our next management session set for Friday, January 8, 1992. Items are listed at random.

- Briefly review notes from meeting #1.

- Review section F of the notes from meeting #1 and select the high priority items to be addressed initially.

- Assign orders of importance to the selected action topics along with the people to be involved in the discussions and implementation of the actions.

- Assign a specific period of time to be used for work on each of the selected items.

- Work on the highest priority items.

- Tentatively plan assignment of other high priority items to future meetings.

From my initial scanning of the material needing attention, I offer the following agenda suggestions. Letters are assigned for reference purposes only. Page numbers refer to the meeting notes from December 18, 1992.

A. Review and assign priorities to items in the master list of 1993 goals and objectives shown in F5e), on pages 4 and 5.

B. Review and assign priorities to DPU projects listed in F5f), on page 5.

C. Review and discuss various management techniques that might be used to help plan implementation of the high priority projects and programs.

These techniques include scope of work definition, selection of project delivery systems, network

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December 28, 1992

modeling or critical path method, data base plan translations, graphic plan translations, weight-value analysis, and resource allocation. Others may prove to be of help as our work proceeds.

D. Begin actual planning of the high priority projects and programs.

This agenda should keep us fully and profitably occupied for the majority of the day.

I further recommend we determine early who is to be involved in each of the agenda item discussions so the actual work effort can be made most effective.This determination should be by the DPU management.

This report is being sent to Mr. Collard only. Further distribution will be by Mr. Collard. If there are any questions about the report, the meeting notes or the decision tree please feel free to call.

Best regards for a happy and successful New Year!

Ralph J. Stephenson, P. E.

Attachments:
- meeting notes
- decision tree

Kalamazoo Department of Utilities notes - disk 339

I. **10:08:16 AM - Friday, December 18, 1992**
   A. **Kalamazoo Department of Utilities management notes**
   B. **By Ralph J. Stephenson, Consultant**
   C. **Date of meeting - Friday, December 18, 1992**
   D. **Those attending**
      1. Ken Collard, P. E. - Utilities Director
      2. Bruce Minsley - Deputy Utilities Director
      3. Frank Szopo, P. E. - Acting City Engineer - DPU & DPW
      4. Jerri Barnett - Moore - Finance DPU
      5. Ralph J. Stephenson - Consultant
   E. **Agenda**
      1. Review cost items of dpu budget
      2. Discuss current projects with dpu staff
      3. √Discuss current status of the dpu
      4. √Review implications of a merger of dpu and dpw
      5. √Review items of management concern with dpu executive staff
   F. **Management discussions**
      1. Ken Collard, P. E. - Utilities Director
         a) Activities of importance that staff might find of help in our work.
            (1) Critical path planning
            (2) Data storage and retrieval
            (3) Decision making
            (4) Education
            (5) Outlining - technography (rjs)
            (6) Scheduling
            (7) Time planning
            (8) Training
         b) Top management should work to shift emphasis from *doing things*, to *managing people to do things*.
         c) The Owner, in a engineering improvement and operation sense, should not abdicate ownership.
      2. Frank Szopo, P. E. - Acting City Engineer dpu/dpw
         a) Major needs
            (1) Temporary engineering merger
               (a) Title - when should it be firmed up?
               (b) Organizational relations
                  i) Formal functional
                  ii) Informal
                  iii) Reporting
                  iv) Staff
                  v) Temporary
            (2) Keeping projects on schedule
               (a) Resource allocation
               (b) Critical path method
               (c) Other systems
                  i) Bar chart translations

ii) Computer diagraming
iii) Data base listings
iv) Management by exception (MX)
v) Post It method

3. Bruce Minsley - Deputy Utilities Director
   a) Interested in the reasons for success and failure of network modeling
   b) Stressed the pressures in the dpu's work to conform to the calendars of others (rjs note: this is an area of directed time, authority and responsibility we should discuss relative to resource allocation)
4. Jerri A. Barnett - Moore - Customer Services and Finance Manager - Commercial Division
   a) Management information services (mis)
      (1) What should the mis be?
         (a) A service oriented organization designed to provide all city management with accurate, concise information (to be completed)
      (2) Why does the dpu need an mis?
         (a) To provide revenue and expenditure tracking and data.
         (b) To provide operations productivity data on operations.
         (c) To provide data on
            i) Billable flow amounts
            ii) Contractor records
            iii) Cost accounting
            iv) Historical operations data
            v) Laboratory operations
            vi) Laboratory records
            vii) Monitored customer records - those that exceed normal domestic waste strengths
            viii) Number of new hydrants
            ix) Number of new service connections
            x) Professional service records
            xi) Purchasing tracking
            xii) Tracking bonding
            xiii) Vendor records
            xiv) Water pumping and waste water treatment pumping relative to billing.
      (3) Who should use the mis?
         (a) All dpu water divisions
            i) Water supply operations - bmi
            ii) Administration - kco
            iii) Accounting - jbm
            iv) Commercial office - jbm
            v) Inventory - jbm
            vi) Engineering - fsz
            vii) Building services - bmi
         (b) All dpu waste water divisions
            i) Administration - kco & bmi
            ii) Technical services - bmi
            iii) Waste water plant operations - bmi
            iv) Process control - bmi

v) Inventory - jbm
vi) Collection - bmi
vii) Maintenance - bmi

(4) How can mis be used by the Commercial Division?
(5) How can mis be used by the pu/pw engineering division?
(6) How can mis be used by dpu field operations, plant operations, collection, and distribution division?
(7) How can mis be used by the Utilities Director?
(8) What are the benefits of a department based mis system?
(9) What are the benefits of city management based mis system?
(10) What configuration might be used for an in house mis system?
  (a) LAN
(11) What information is needed in the mis?
(12) Observations
  (a) City has not looked at the stand alone application of financial and operational data.
  (b) City is now trying to implement a system to correct this problem.
  (c) Information resident in any one computer should be available to all users.
  (d) Do not need special use hardware or software.
(13) What does the present mis system contain?
  (a) Assessed valuations
  (b) Tax data
  (c) Housing data
  (d) Fixed asset system
  (e) Purchasing
  (f) Human resources management
  (g) Budgetary accounting system
  (h) Utility billing system
  (i) Inventory system
  (j) Miscellaneous receipt file
(14) dpu uses the following
  (a) Inventory system
  (b) Budgetary accounting system
  (c) Utility billing system
  (d) Miscellaneous receipt file
  (e) Fixed asset system
(15) Approaches to getting an in house mis system
  (a) System is used so much that it presently would be more effective being applied without the dpu.
(16) Costs of in house dpu mis system - approx. $300,000
  (a) Hardware
  (b) Consultants to configure
  (c) Consultants to interrelate packages
(17) Should we remove the customer billing system from the mis?
  (a) Could place in a service bureau.

b) Decision tree analysis for mis course of action - jbm - See sht DT1 issue #1, dated December 18, 1992

5. General points mentioned or discussed
   a) Some of the main basic service functions of the dpu are accounting, billing and inventory
   b) It often appears that the customer base inside the City *is not* growing, while the customer base outside the City *is* growing.
   c) Three general questions that must be addressed and answered in any improvement effort
      (1) What is the mission?
      (2) What is the problem?
      (3) What is the solution?
   d) What, if any, is the difference between managing a city and governing a city?
   e) 1993 goals and objectives - copied from an undated draft copy; no author specified
      (1) Public Relations / Public Education
         (a) Advisory Committee Expand / Energize
         (b) Civic Infrastructure Development
         (c) Media Contacts
         (d) Demonstrate Results
         (e) Survey Customers / Employees
      (2) Management Information
         (a) UCAT
         (b) Reports
         (c) Cost Accounting
         (d) Budgeting Alternatives
         (e) Performance Audits
         (f) NCC Modifications / Implementation
         (g) Cost of Regulatory Mandates
      (3) Staff Development
         (a) Pre-Supervisory Classes
         (b) Project Management Training
         (c) Diversity Education / Action
         (d) Director on the Job
         (e) NCC Training
         (f) Blending with Vertical Info Dispersal
      (4) Strategic Planning
         (a) Update Master Plans
         (b) Update Standard Policies and Procedures
         (c) Fiscal / Rate Policy Development
         (d) Space Allocation Study
         (e) Regulatory Futures
      (5) Service Optimization / Cost Containment
         (a) Organizational Analyses
            i) Engineering
            ii) Motor Pool
            iii) Central Stores
            iv) Hierarchal Structure
         (b) Departmental TQM Committee
         (c) WRP Process Optimization

(d) Survey of Comparable Utilities
(e) Performance Indices
(6) Capital Improvement Program Implementation
(a) Project Management Planning
(b) Public Notice

f) Current and projected dpu projects as of 12/21/92 - listed on board
(1) Arcadia Creek improvements
(2) Central well field
(3) Cork Street land fill
(4) Department of Public Works and Department of Utilities merger
(5) Department of Public Works facility plan
(6) Geographic Information System
(7) Management Information Services
(8) Master plans update
(9) Oshtemo tank
(10) Richland and Cooper well fields
(11) Storm water utility
(12) Street resurfacing
(13) WMU Research Park

G. **Definitions**

1. City management - rjs
   Those departments and individuals in the upper echelons of the City organization that are responsible for properly managing the expenditure of the City's income. (this definition is to be reviewed)
2. Encumbrances
   Those committed funds that have not been expended.
3. Income generators - rjs
   Those who generate direct income for the City of Kalamazoo.
4. Income spenders - rjs
   Those who spend income for the City of Kalamazoo.
5. Mission - rjs
   A brief statement of the most important result to be obtained by making the effort being considered.
6. Problem - rjs
   A deviation from an accepted or approved standard of performance.
7. Solution - rjs
   A generally acceptable resolution of a problem.

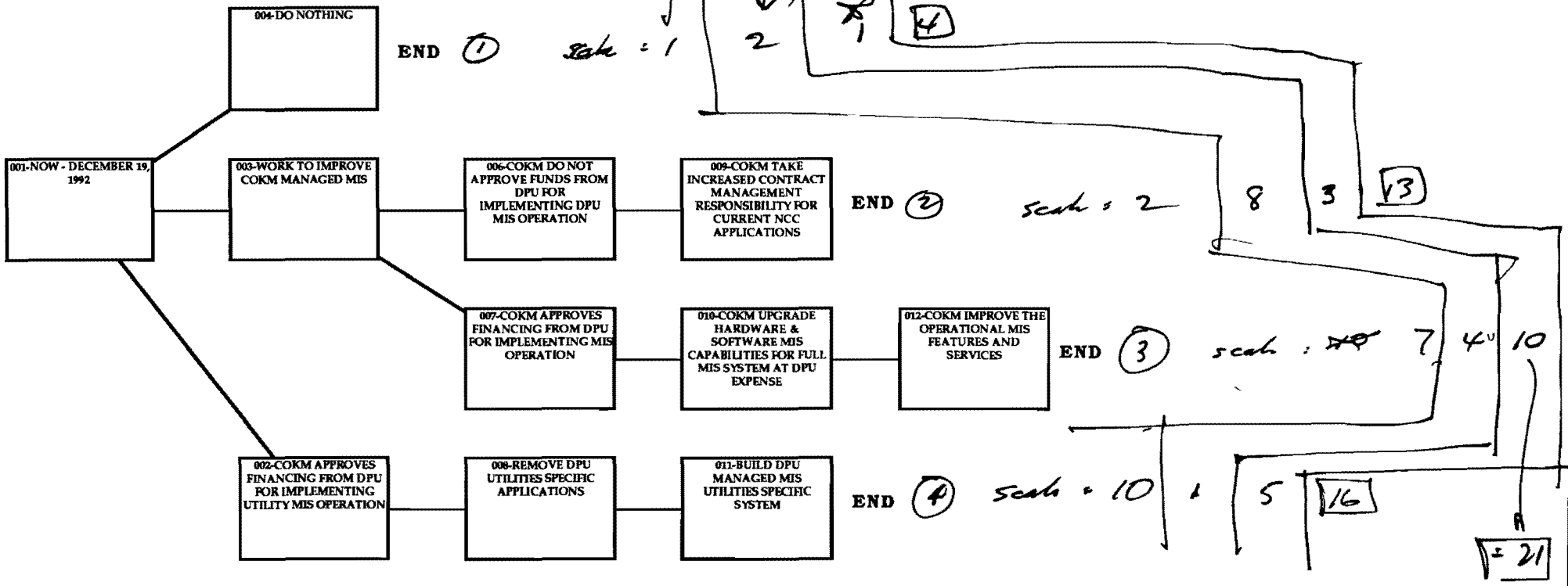
H. **Abbreviations**

1. bmi - Bruce Minsley - Deputy Utilities Director
2. dpu - Department of Public Utilities
3. dpw - Department of Public Works
4. fsz - Frank Szopo, P. E. - Acting City Engineer - DPU & DPW
5. gis - Geographic Information System
6. jbm - Jerri Barnett - Moore - Customer Services and Finance Manager - Commercial Division
7. jho - Jim Holgersson - City Manager
8. kco - Ken Collard, P. E. - Utilities Director

9. lan - Local area network
10. mis - Management Information Services
11. mot - Mark Ott - Deputy City Manager
12. mx - Management by exception
13. ncc - mis consultants
14. pdi - Pat DiGiovanni - Assistant City Manager
15. pmc - Paul McTosh - Water superintendent
16. pu - Public utilities
17. pw - Public works
18. tqm - Total quality management
19. ucat - ?
20. wmu - Western Michigan University
21. wrp - ?

I. **Those involved**

1. City Administration
    a) Pat DiGiovanni - Assistant City Manager
    b) Mark Ott - Deputy City Manager
    c) Jim Holgersson - City Manager
2. City Assessor
3. City Attorney
4. City Auditor
5. City Clerk
6. Department of Finance
7. Department of Housing
8. Department of Human Resources
9. Department of Public Safety
10. Department of Public Utilities
    a) Ken Collard, P. E. - Utilities Director
    b) Bruce Minsley - Deputy Utilities Director
    c) Frank Szopo, P. E. - Acting City Engineer - DPU & DPW
    d) Jerri Barnett - Moore - Finance
    e) Paul McTosh - Water superintendent
11. Department of Public Works
12. Department of Purchasing
13. Management Information Services



DECISION TREE FOR IMPROVING MANAGMENT INFORMATION SYSTEM

City of Kalamazoo, Michigan, Department of Utilities

- Ken Collard, P. E. - Utilities Director
- Jeeri A. Barnett - Moore - Commercial Division
- Bruce Minsley - Deputy Utilities Director
- Frank Szopo, P. E. - Acting City Engineer

Abbreviations:

COK - City of Kalamazoo
COKM - City of Kalamazoo management
MIS - Management Information System
NCC - MIS consultant

Issue #1 - December 18, 1992
edited 12/28/92
i1 lw dpu mis dec tree
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SHEET #DT 1

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February 28, 1993

Subject: Kalamazoo Department of Utilities Report #2

To: Kenneth P. Collard, P. E. - Director DPU

From: Ralph J. Stephenson, P. E. - Consultant

Project: 92:52

Disk #: 339

Dates of meetings: Friday, January 8, 1993 (wd 516)
Thursday, February 18, 1993 (wd 545)

Those attending:

Friday, January 8, 1993 (Some in meeting part time only)

- Kenneth P. Collard - Director of Utilities
- Frank Szopo - Acting City Engineer - Department of Public Works & Utilities
- Jerri Barnett - Moore - Finance DPU
- Ralph J. Stephenson - Consultant

Thursday, February 18, 1993 (Some in meeting part time only)

AM
- Kenneth P. Collard - Director of Utilities
- Jim Gallogly - Director of Public Works - for brief period only
- Don Nelson -Department of Public Works fleet operations manager - until 10:30 am
- Joe Flegal - Department of Public Utilities fleet operations manager
- Ralph J. Stephenson - Consultant

PM
- Kenneth P. Collard, P. E. - Director of Utilities
- Jim Gallogly - Director of Public Works - after 4:00 pm
- Bruce Minsley - Deputy Utilities Director - early pm
- Ralph J. Stephenson - Consultant

Actions taken:

Friday, January 8, 1993

- Reviewed and identified possible courses of information management action.
- Prepared list of Kalamazoo DPU programs currently being considered.
- Began assigning priorities and estimated costs to DPU program list

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February 28, 1993

Thursday, February, 18, 1993

- Reviewed background of DPW and DPU fleet operations with Mr. Flegal, Mr. Nelson, and Mr. Collard.
- Reviewed selected fleet cost evaluations with Mr. Bruce Minsley.
- Reviewed and discussed shared fleet observations with Mr. Jim Gallogly and Mr. Ken Collard.

General summary:

Friday, January 8, 1993

This was the second in the series of management meetings with the Department of Public Utilities staff. These meetings are designed to help establish guidelines for Kalamazoo's utility program planning.

The meeting notes enclosed (Attachment A) summarize the results of our work in the meeting. Please note that some additions have been made and some editing done subsequent to the meeting.

An early discussion topic was the current management information system (MIS) and how it might be improved. We first reviewed the decision tree, sheet #DT1 (Attachment B), prepared at our meeting on Friday, December 18, 1992. To clarify the meaning of each branch of the tree we prepared a brief narrative for each course of action and assigned weights and values to each branch.

It was agreed by all parties that course of action #1, do nothing, was unacceptable.

Course of action #2 offered few incentives, and essentially said that no one has to do anything not being done now (see boxes 003, 006 & 009).

Course of action #3 showed that the DPU would finance the MIS operation for utilities specific needs. The City of Kalamazoo management, through the MIS, would still have responsibility for establishing, maintaining and operating the utilities specific portion of the system (shown in boxes 003, 007, 010, & 012)

Course of action #4 states that DPU would transfer the City's data base for utilities specific systems to a DPU managed system from the COKM MIS. The responsibility and actions needed for establishing, maintaining and operating the utilities specific portion of the system would then belong to DPU. (shown in boxes 002, 008, & 01).

These courses of action were rated and it was found that action #3 currently had the best probability of succeeding. The rating was made using two different methods.

The first method required the DPU staff involved to make an evaluation from the viewpoint of the City of Kalamazoo management, from the viewpoint of the DPU, and from a detached unbiased position.

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February 28, 1993

The ratings were based on a minimum of 01, the worst possible set of actions, to a maximum of 10, the best possible set of actions. The DPU staff arrived at a rating consensus for each course of action based on the total of the ratings they gave each of the three viewpoints. The highest rating possible was 30 (3, the number of viewpoints multiplied by 10, the highest rating for a course of action).

Ratings for each course of action were as follows:

- Course of action #1 = 04
- Course of action #2 = 13
- Course of action #3 = 21
- Course of action #4 = 16

Next, the four courses of action were rated by identifying explicit factors that the DPU staff felt should be used in selecting a course of action. These were:

- **A. Cost**
  Total differential cost to:
    Consumers
    DPU
    COK

- **B. Political**
  Political attitudes relative to:
    COK management needs
    COK political positions
    Political vulnerability considerations

- **C. Technical integrity**
  Technical soundness based on the following:
    System accuracy
    Data retrieval
    Data input ease
    System flexibility
    System dependability
    System redundancy
    Ease of networking with stand alone stations.
    Additional software needs
    Additional hardware needs
    Contractibility (size & complexity) of system
    Expandability of system
    Time as related to system effectiveness
    Time to bring on line
    Operating characteristics

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February 28, 1993

Staff requirements

The weight, or importance, of each factor out of a possible total of 30, and as determined by the DPU staff, were as follows:

- Costs 16
- Political 17
- Technical integrity 29

A value was next assigned to each course of action and multiplied by the factor weight. The highest possible score in this evaluation is 620 (160 + 170 + 290). This analysis showed the following:

- Course of action #1 = 240
- Course of action #2 = 320
- Course of action #3 = 485
- Course of action #4 = 374

For additional details of each of the two rating systems please refer to the meeting notes.

In the afternoon Mr. Szopo and I prepared a preliminary list of Department of Public Utility programs being considered for implementation (Attachment C). The list was preliminary and should be further refined and studied.

Thursday, February 27, 1993

This was the third management meeting with the Department of Utilities staff in which the work objectives were concentrated on planning for the future of Kalamazoo's public utility functions.

The major topic discussed was the subject of shared fleet operation resources. A general summary of the meeting with some subsequent editing and additions is contained in the meeting notes (Attachment D).

Also enclosed is sheet FRDT#1 (Attachment E), dated February 27, 1993. This is a decision tree analysis of various courses of action that might be taken in respect to a sharing of fleet resources by the DPW and DPU. The tree is a graphic depiction of the narrative outline contained on page #3, item F4 in the meeting notes.

The decision tree shows alternate courses of action that were discussed and evaluated relative to sharing fleet resources. No judgment was made at this meeting by the DPU or DPW staff members on the relative merits of the various branches. The tree is to be further studied.

The DPU and DPW fleets are those used in operating, maintaining, and improving the city's physical infrastructure. This is a critical function and the DPW has reached a major milestone decision point in its fleet operations. Design studies by a design team and DPW indicate the present DPW fleet operations building may not be capable of being remodeled so as to adequately meet the future needs of

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February 28, 1993

the DPW.

A new facility is being planned that will house DPW's administration, equipment, and construction related operations. The facility is currently being designed to accommodate future expansion.

It appears in light of the shared resource concept, that the new facility program, design, and construction might best be written and implemented in a manner so as to specifically accommodate fleet resource sharing by the DPW and the DPU.

I strongly recommend that the pros and cons of designing and building a planned shared facility be carefully studied before final construction documents are put in work. In this particular instance there are some long standing historical factors that apparently impact on the program and design of the facility. They, as well as the newer considerations of the potential advantages of shared facilities, should be considered.

A fleet sharing consolidation, irrespective of what decision is made in the design program, will have considerable impact upon the timing and nature of the new DPW facility construction and operation. Early steps should be considered carefully.

This report is being sent to Mr. Collard only. Further distribution will be by him. If there are any questions regarding the report or the attachments please call or write.

I shall be in touch with Mr. Collard soon to set our next management meeting.

Ralph J. Stephenson, P. E.

Attachments:
- meeting notes - A & D
- program list - C
- decision trees - B & E

III. **10:33:11 AM - Friday, January 8, 1993 - added to and edited 02/27/93 - *ATTACHMENT A***

A. **Kalamazoo Department of Utilities management meeting notes**
B. **By Ralph J. Stephenson, Consultant**
C. **Date of meeting - Friday, Friday, January 8, 1992**
D. **Those attending**
   1. Ken Collard, P. E. - Utilities Director
   2. Frank Szopo, P. E. - Acting City Engineer - DPU & DPW
   3. Jerri Barnett - Moore - Finance DPU
   4. Ralph J. Stephenson - Consultant
E. **Agenda**
   1. Review and identify courses of action for MIS
   2. Review & assign priorities to master goals & objectives.
   3. Review & assign priorities to DPU projects currently being considered.
   4. Review & discuss management techniques for implementation
   5. Begin actual network modeling and planning of selected project.
F. **MIS discussion**
   1. Description of action courses - see sheet #DT 1, issue #1, dated December 18, 1992 for decision tree
      a) Course of action #1, do nothing, is unacceptable to all parties (box #004)
      b) Course of action #2 is too fuzzy, and really doesn't say anybody has to do anything not being done now (boxes 003, 006 & 009)
      c) Course of action #3 - DPU would finance the MIS operation for utilities specific needs and the COKM MIS would have the responsibilty for establishing, maintaining and operating the utilities specific portion of the system (boxes 003, 007, 010, & 012)
      d) Course of action #4 - DPU would take the city's data base for utilities specific systems and transfer the input to the DPU from the COKM MIS. The responsibility and actions needed for establishing, maintaining and operating the utilities specific portion of the system would belong to DPU. (boxes 002, 008, & 011.
         (1) Advantages
            (a) DPU could offer the CKOM a backup system
            (b) System could also be managed by the actual user.
   2. Courses of action rating
      a) Course of action #1
         (1) From COKM (City of Kalamazoo Management) perception = 2
         (2) From DPU (Department of Public Works) perception = 1
         (3) Projected detached (uncommitted& unbiased) perception = 1
         (4) **Total = 4**
      b) Course of action #2
         (1) From COKM perception = 8
         (2) From DPU perception = 2
         (3) Projected detached perception = 3
         (4) **Total = 13**
      c) Course of action #3
         (1) From COKM perception = 4
         (2) From DPU perception = 7
         (3) Projected detached perception = 10
         (4) **Total = 21**

d) Course of action #4
   (1) From COKM perception = 1
   (2) From DPU perception = 10
   (3) Projected detached perception = 5
   (4) **Total = 16**

3. Factors to be considered in selecting a course of action
   a) Cost
      (1) Total differential cost
         (a) To consumer
         (b) To DPU
         (c) To COK
      (2) Political vulnerability
   b) Political
      (1) Political attitudes
      (2) COK management attitudes
      (3) COK political attitudes
      (4) Political vulnerability
   c) Technical integrity
      (1) System accuracy
         (a) Data retrieval
         (b) Data input ease
         (c) System flexibility
      (2) System dependability
      (3) System redundancy
      (4) Technical integrity (technical soundness) of system
      (5) Ease of networking with stand alone stations.
      (6) Additional software needs
      (7) Additional hardware needs
      (8) Contractibility (size & complexity) of system
      (9) Expandibility of system
      (10) Time as related to system effectiveness
         (a) Time to bring on line
         (b) Operating characteristics
         (c) Staff requirements

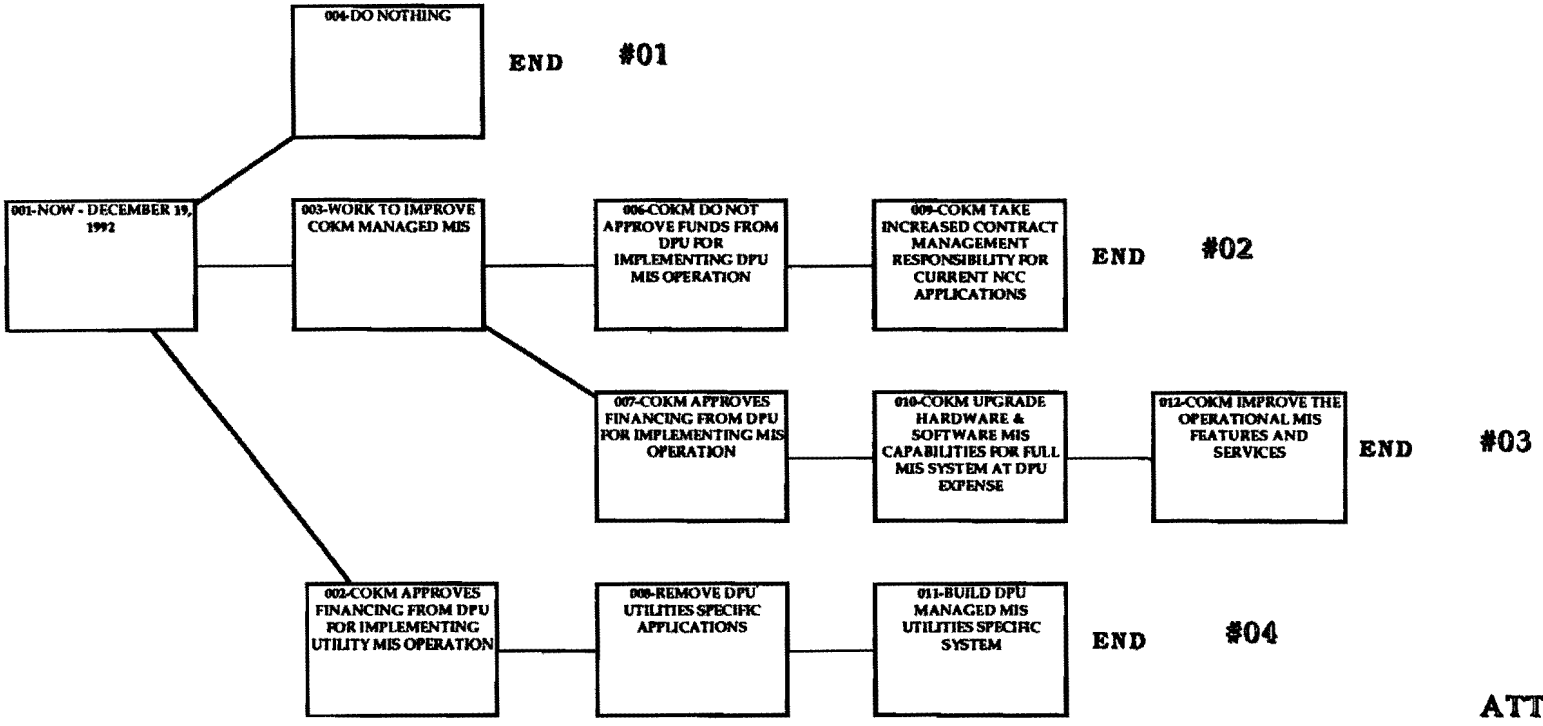
4. Weight of factors
   a) Costs
      (1) From COKM perception = 8
      (2) From DPU perception = 2
      (3) Projected detached perception = 6
      (4) **Total = 16**
   b) Political
      (1) From COKM perception = 10
      (2) From DPU perception = 4
      (3) Projected detached perception = 3
      (4) **Total =17**
   c) Technical integrity
      (1) From COKM perception = 9

(2) From DPU perception = 10
(3) Projected detached perception = 10
(4) **Total = 29**

5. Values of courses of action & factors

Action	Cost			Political			Technical Integrity				Totals
	(wt)	(v)	(w x v)	(wt)	(v)	(w x v)	(wt)	(v)	(w x v)		
#1	16	10	160	17	3	51	29	1	29	=	240
#2	16	10	160	17	6	102	29	2	58	=	320
#3	16	4	64	17	8	136	29	10	290	=	485
#4	16	1	16	17	4	68	29	10	290	=	374

G. **Abbreviations - added 02/27/93**
1. cok - City of Kalamazoo
2. cokm - City of Kalamazoo Management
3. dpu - Department of Public Works



ATTACHMENT B

DECISION TREE FOR IMPROVING MANAGMENT INFORMATION SYSTEM

City of Kalamazoo, Michigan,
Department of Utilities

- Ken Collard, P. E. - Utilities Director
- Jeeri A. Barnett - Moore - Commercial Division
- Bruce Minsley - Deputy Utilities Director
- Frank Szopo, P. E. - Acting City Engineer

Abbreviations:

COK - City of Kalamazoo
COKM - City of Kalamazoo management
MIS - Management Information System
NCC - MIS consultant

Issue #1 - December 18, 1992
edited 12/28/92
i1 lw dpu mis dec tree
disk 339

	code	project	priority rtg - 1 low, 10 high	approx 1993 cip budget in 000's	approx total project budget in 000's	start date ±	comp date ±	oen	date entered
1	1.000	• Public relations & public education						1	1/8/93
2	1.010	Expand & energize advisory committee						2	1/8/93
3	1.020	Develop civic infrastructure						3	1/8/93
4	1.030	Plan & implement media contact program						4	1/8/93
5	1.040	Plan & implement result demonstration program						5	1/8/93
6	1.050	Survey customers & employees						6	1/8/93
7	2.000	• Department of Public Utilities capital improvement projects						7	1/8/93
8	2.010	Arcadia Creek improvements - 1993 cip	6	$50	$200	9106 - Jun, 1991	9306 - Jun, 1993	8	1/8/93
9	2.020	Central well field reconstruction	10	$3,560	$8,100	8601 - Jan, 1986	9501 - Jan, 1995	9	1/8/93
10	2.030	Install geographic information system (GIS)	4	$55	$1,500	9301 - Jan, 1993	9612 - Dec, 1996	12	1/8/93
11	2.040	Update water system capital expenditure master plan	4	$0	$50	9401 - Jan, 1994	9409 - Sep, 1994	13	1/8/93
12	2.050	Update waste water system capital expenditure master plan	4	$0	$25	9401 - Jan, 1994	9409 - Sep, 1994	14	1/8/93
13	2.060	Oshtemo water storage tank installation	10	$1,800	$2,000	9101 - Jan, 1991	9312 - Dec, 1993	16	1/8/93
14	2.070	Richland well field hydrogeologic study (includes study & purchase of land)	5	$194	$194	9201 - Jan, 1992	9312 - Dec, 1993	17	1/8/93
15	2.080	Cooper Township well field hydrogeologic study (includes study & purchase of land)	5	$289	$289	9101 - Jan, 1991	9312 - Dec, 1993	18	1/8/93
16	2.090	Sanitary sewers to serve new research park	9	$625	$675	9101 - Jan, 1991	9307 - Jul, 1993	21	1/8/93

	code	project	priority rtg - 1 low, 10 high	approx 1993 cip budget in 000's	approx total project budget in 000's	start date ±	comp date ±	oen	date entered
17	2.100	Water reclamation plant engineering studies , rehabilitation & replacement - 1993 cip (11 projects)	10	$300	$4,000	9101 - Jan, 1991	9510 - Oct, 1995	22	1/8/93
18	2.110	Booster Station #28 construction	8	$150	$200	9201 - Jan, 1992	9308 - Aug, 1993	25	1/8/93
19	2.120	Booster Station #29 construction	8	$125	$135	9210 - Oct, 1992	9308 - Aug, 1993	26	1/8/93
20	2.130	Renovate water pumping station #22	7	$51	$51	9301 - Jan, 1993	9312 - Dec, 1993	27	1/8/93
21	2.140	Design and renovate water pumping station #8	1	$9	$70	9201 - Jan, 1992	9412 - Dec, 1994	28	1/8/93
22	2.150	Design and renovate water pumping station #5	2	$8	$70	9301 - Jan, 1993	9412 - Dec, 1994	29	1/8/93
23	2.160	Design and install back up generator at Utility Service Building	4	$75	$75	9201 - Jan, 1992	9312 - Dec, 1993	30	1/8/93
24	2.170	Design and install WRP industrial hydrogen peroxide feed system	7	$23	$23	9301 - Jan, 1993	9312 - Dec, 1993	31	1/8/93
25	2.180	Computer study for wet air regeneration building at WRP (water reclamation plant)	4	$50	$150	9301 - Jan, 1993	9309 - Sep, 1993	32	1/8/93
26	2.190	Pave water reclamation plant roads	7	$103	$103	9301 - Jan, 1993	9310 - Oct, 1993	33	1/8/93
27	2.200	Computer study & replacement of high level computer, DCU's, and LOC's at WRP	8	$69	$750	9201 - Jan, 1992	9512 - Dec, 1995	34	1/8/93
28	3.000	• General fund projects						24	1/8/93
29	3.010	Cork Street land fill remediation program						10	1/8/93
30	4.000	• Department of Public Works capital improvement projects						23	1/8/93
31	4.010	New DPW facility						11	1/8/93
32	4.020	Update Department of Public Works capital expenditure master plan						15	1/8/93

	code	project	priority rtg - 1 low, 10 high	approx 1993 cip budget in 000's	approx total project budget in 000's	start date ±	comp date ±	oen	date entered
33	4.030	Storm water utility development						19	1/8/93
34	4.040	City street resurfacing - 1993 cip						20	1/8/93
35	5.000	• Department of Public Utilities administration						35	1/8/93
36	5.010	Prepare & implement DPU/DPW engineering merger plan						37	1/8/93
37	6.000	• Department of Public Works administration						36	1/8/93
38	7.000	• Managment information						38	1/8/93
39	7.010	UCAT						39	1/8/93
40	7.020	Reports						40	1/8/93
41	7.030	Cost accounting						41	1/8/93

IV. **3:51:07 PM - Thursday, February 18, 1993 - added to and edited 02/27/93 - *ATTACHMENT D***
- A. **Kalamazoo Department of Utilities management notes**
- B. **By Ralph J. Stephenson, Consultant**
- C. **Date of meeting - Thursday, February 18, 1993**
- D. **Those attending in A. M.**
  1. Ken Collard, P. E. - Utilities Director
  2. Don Nelson - D. P. W. - until 10:30 am
  3. Joe Flegal - D. P. U.
  4. Ralph J. Stephenson - Consultant
- E. **Those attending in P. M.**
  1. Ken Collard, P. E. - Utilities Director
  2. Bruce Minsley - Deputy Utilities Director - until about 4:00 pm
  3. Jim Gallogly - Director of Public Works - at about 4:00 pm
  4. Ralph J. Stephenson - Consultant
- F. **Notes (from marker board notes & written notes)**
  1. Subjects to be discussed & defined
     - a) Mission - the most important thing to be accomplished
     - b) Goals - unquantified targets
     - c) Objectives - quantified targets
     - d) Problems - deviations from expected standards of performance.
     - e) Job description
     - f) Value added
     - g) Infrastructure
     - h) What of value can rjs add to the matter at hand?
     - i) What attention is deserved/needed?
     - j) What planning period should be used? (assume 5 to 8 years)
     - k) Interrelations (bubble)
     - l) Yard & shop operations
     - m) Store operations
  2. Questions
     - a) What do you four people -- Jim Gallogly, Ken Collard, Don Nelson and Joe Flegal -- want to happen so as to execute the mission through achieving defined goals & their derived objectives?
     - b) What are the functions of the DPW and the DPU? Those functions being shared now are noted.
       - (1) Fuel system - currently being shared
       - (2) Equipment service and maintenance
       - (3) Infomation system - currently being shared with other City departments
       - (4) Purchasing - currently being shared in some respects
       - (5) Physical facilities
       - (6) Training
       - (7) Rolling stock
       - (8) Personnel
       - (9) Construction forces
       - (10) Warehousing

c) What are the universes within which city departments such as the DPU and the DPW can effectively function?
   (1) Equipment
   (2) Administration
   (3) Line operations
   (4) Financial operations
   (5) Engineering
   (6) Construction
   (7) Providing the core universes above with fleet service excluding Metro Transit.
   (8)

3. General comments
   a) Focus is to be only on the use of fleet resources
      (1) Administration
      (2) Equipment operations
      (3) Field operations
      (4) Fixed base facilities
   b) DPU & DPW can share or not share fleet resources
      (1) Can be based on single or multiple management of fleet resources
      (2) Can be based on central or diverse geography of fleet operations
   c) An important current question regards the proposed programming, design, and construction of a new DPW facility - sample general thoughts and points of discussion to be considered are listed below:
      (1) The new facility will house DPW administration, equipment, and construction related operations
      (2) Is being designed to accomodate future expansion
      (3) What expansion plans are being used for the basis of the present design?
      (4) Is apparently not being designed to specifically consider a present sharing of fleet operations with the DPU.
      (5) A question arose as to whether the new facility program and design should be restudied to accomodate a sharing of fleet resources as presently being considered.
         (a) Plusses ? (should be listed)
         (b) Minuses ? (should be listed)
         (c) It might be interesting to consider _____ _____(what might be interesting to consider?)
            i) Insert ideas that might influence a decision in the matter
      (6) From our meeting on 02/18/93 it appears to me that the facility could benefit from a reconsideration of the design program.
         (a) Particularly true if fleet consolidation is accorded a high desirablility of consideration.
         (b) A fleet sharing decision, irrespective of what the decision is, will have an impact upon the timing and nature of the facility programming, design and construction.
         (c) Thus the fleet sharing decision becomes of considerable importance to the new DPW facility.

d) It was pointed out that the DPW and DPU operations serve different boundaried geographic areas.
   (1) DPW field operations are generally city wide
   (2) DPU field operations are generally county wide.

e) Design studies by the design team and the DPW indicate the present DPW fleet operations building is not capable of being remodeled so as to adequately meet the needs of the DPW.

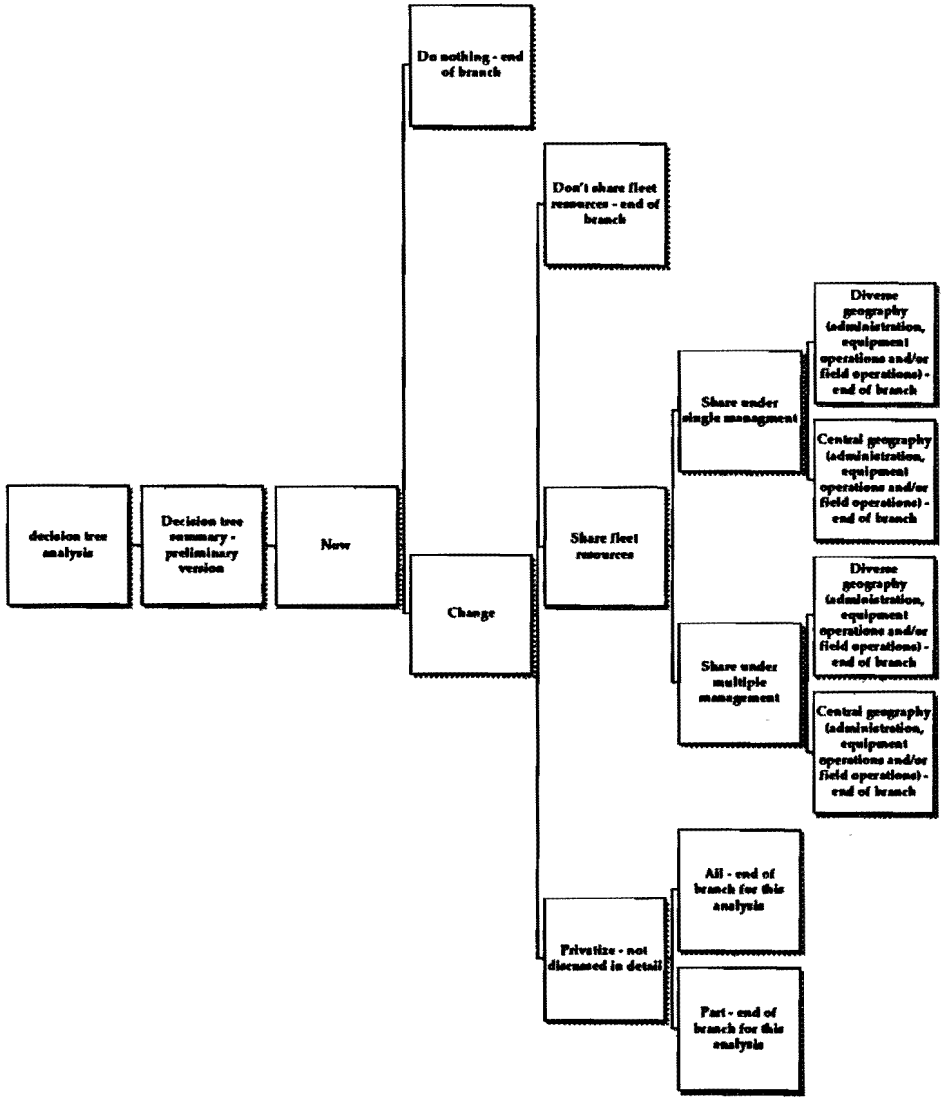
4. Decision tree summary - preliminary version
   a) Now
      (1) Do nothing - end of branch
      (2) Change
         (a) Don't share fleet resources - end of branch
         (b) Share fleet resources
            i) Share under single managment
               (1) Diverse geography (administration, equipment operations and/or field operations) - end of branch
               (2) Central geography (administration, equipment operations and/or field operations) - end of branch
            ii) Share under multiple management
               (1) Diverse geography (administration, equipment operations and/or field operations) - end of branch
               (2) Central geography (administration, equipment operations and/or field operations) - end of branch
         (c) Privatize - not discussed in detail
            i) All - end of branch for this analysis
            ii) Part - end of branch for this analysis

G. Definitions - added 02/27/93

1. Administration
   The top echelons of the overall management of the operation under consideration. In fleet operations may consist of information system services, purchasing, training, personnel, finance operations, policy making and other like functions. Administrative functions are usually considered to be supportive of equipment and field, or construction operations.

   Supportive means administration is responsible for bringing resources to the point of use and managing properly at the top level to insure they are used effectively.
2. Supportive
   That group, usually part of the administrative effort that is responsible for bringing resources to the point of use and applying top level managment to insure resources are used effectively at all levels.

Ralph J. Stephenson, P. E., P. C
Consulting Engineer
February 27, 1993



Ralph J. Stephenson, P. E., P. C.
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph 517 772 2537
April 10, 1993

Subject: Kalamazoo Department of Utilities management report #3

To: Kenneth P. Collard, P. E. - Director DPU

From: Ralph J. Stephenson, P. E. - Consultant

Project: 92:52

Disk #: 339

Date of meetings: Friday, April 2, 1993 (wd 576)

Those attending:

A. M.

- Kenneth P. Collard - Director of Utilities - (in meeting part time)
- Frank Szopo - Utilities Engineering Manager - Department of Utilities & Public Works
- Alberto Forero - Project Manager - Department of Utilities & Public Works
- Tom Metcalf - Principal - Jones & Henry Engineers, Inc.
- Mark Siebert - Project Manager - PDM
- Ralph J. Stephenson - Consultant

P. M.

- Kenneth P. Collard - Director of Utilities - (in meeting part time)
- Frank Szopo - Utilities Engineering Manager - Department of Utilities & Public Works
- Alberto Forero - Project Manager - Department of Utilities & Public Works
- Robert Reimink - Project Manage - Prein & Newhof, P. C.
- Ralph J. Stephenson - Consultant

Actions taken:

- Prepared network model for Oshtemo storage tank project
- Prepared network model for well field restoration project

General Summary:

These meetings were for the purpose of planning two projects -- construction of the Oshtemo Water Storage Tank construction, and design of the Central Well Field Complex Restoration. We worked in the morning on the Oshtemo tank project and in the afternoon on the central well field restoration.

As the projects were planned, we were also able to review the principles of critical path planning and scheduling with project team members. Copies of the two project networks resulting from our work were

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April 10, 1993

printed at the meetings and given to project team for their use.

Subsequent to the sessions I added procurement items to the Oshtemo tank plan of work, numbered the activities on both networks, and made minor editing changes to the work plans. Three copies of each are enclosed with this report. Attachment A is for the tank project, and Attachment D is for the well field project.

I also prepared two kinds of translations of the information in the networks. The first, Attachment B for the Oshtemo tank project, and Attachment E, for the well field restoration, are bar charts derived directly from the network logic plans. Open bars on the chart show the early start and early finish dates. Shaded bars show the late start and late finish dates.

The second translation shown in Attachment C for the Oshtemo tank project, and Attachment F, for the well field restoration, are listings of project activities arrayed in early start, early finish order. These listings are often helpful in managing and monitoring the projects. Their use makes it relatively simple to determine what activities should have been started or finished by any desired date.

For instance from Attachment C, the data listing for the Oshtemo tank work, if it is desired to determine what early start activities should should have been started by the A. M. of October 18, 1993 (wd 714), it is merely necessary to locate the date nearest October 18, 1993 in the early start column. The first of these is on line 50 -- activity 071, construct floor slab on grade. All activities above line 50 must have been started if the project manager is using early starts as scheduled target dates.

It should be noted that the information in Attachments C and F can be selectively arrayed in any sequence desired. This flexibility as to how the data is located and displayed makes these activity listing very valuable management tools.

This report is being sent to Mr. Collard directly. Further distribution to Mr. Szopo and others involved in the projects will be by him. I highly recommend Mr. Szopo be provided copies of the material for review with his staff, his consultants, and the general contractor. These people all provided excellent information in the planning work resulting in the networks, the bar charts, and the listings.

I shall be in touch with Mr. Collard soon to determine the next step in working with management methods, decision making techniques, and planning tools for the Department of Utilities staff.

Ralph J. Stephenson, P. E.

Attachments:
- A & D - Network diagrams
- B & E - Bar charts
- C & F - Activity listings

	activity	project	earliest start	earliest finish	latest start	latest finish	days
1	001-T/R TO APRIL 2, 1993	tank	4/2/93	4/2/93	4/2/93	4/2/93	0
2	002-DPU CHECK SITE EQUIP & OPERATIONAL CLEARANCES - 2	tank	4/2/93	4/5/93	5/14/93	5/17/93	2
3	004-DPU APPLY FOR & OBTAIN BLDG PERMIT FROM OSHTEMO TWP - 2	tank	4/2/93	4/5/93	5/14/93	5/17/93	2
4	003-SME PREPARE & SUBMIT PILING REPORT TO PDM - 3	tank	4/2/93	4/6/93	4/19/93	4/21/93	3
5	005-KALAMAZOO ISSUE NOTICE TO PROCEED - 7	tank	4/2/93	4/12/93	4/2/93	4/12/93	7
6	006-PDM PREPARE & SUBMIT FOUNDATION SHOP DRAWINGS - 7	tank	4/7/93	4/15/93	4/22/93	4/30/93	7
7	007-PDM EXECUTE SUB CONTRACTS - 2	tank	4/13/93	4/14/93	4/29/93	4/30/93	2
8	008-PREPARE & SUBMIT TANK SHOP DRAWING - 24	tank	4/13/93	5/14/93	4/13/93	5/14/93	24
9	011-PDM SUBS PREPARE & SUBMIT INSURANCE CERTIFICATES - 3	tank	4/15/93	4/19/93	5/3/93	5/5/93	3
10	010-J & H REVIEW SHOP DWGS - 11	tank	4/16/93	4/30/93	5/3/93	5/17/93	11
11	015-PREPARE & SUBMIT FOUNDATION RESTEEL SHOP DRAWINGS - 5	tank	4/20/93	4/26/93	5/6/93	5/12/93	5
12	016-PREPARE & SUBMIT CONCRETE MIX DESIGH - 5	tank	4/20/93	4/26/93	5/6/93	5/12/93	5
13	021-PREPARE & SUBMIT PAINT SPEC & COLOR SAMPLES - 5	tank	4/20/93	4/26/93	3/21/94	3/25/94	5
14	013-DPU REVIEW & APPRV SUBS INSURANCE CERTIFICATES - 7	tank	4/20/93	4/28/93	5/7/93	5/17/93	7
15	018-PREPARE & SUBMIT OUTSIDE UNDERGROUND PIPING SHOP DRAWINGS - 10	tank	4/20/93	5/3/93	7/1/93	7/15/93	10
16	031-PREPARE & SUBMIT INTERIOR VALVE & PIPING SHOP DRAWINGS - 10	tank	4/20/93	5/3/93	8/13/93	8/26/93	10
17	037-PREPARE & SUBMIT OVERHEAD DOOR SHOP DRAWINGS - 10	tank	4/20/93	5/3/93	8/26/93	9/9/93	10
18	038-PREPARE & SUBMIT TELEMETRY SHOP DRAWINGS - 10	tank	4/20/93	5/3/93	9/29/93	10/12/93	10
19	036-PREPARE & SUBMIT CATHODIC PROTECTION SHOP DRAWINGS - 10	tank	4/20/93	5/3/93	10/4/93	10/15/93	10
20	020-REVIEW & APPROVE CONCRETE MIX DESIGN - 10	tank	4/27/93	5/10/93	5/13/93	5/26/93	10

	activity	project	earliest start	earliest finish	latest start	latest finish	days
21	022-REVIEW & APPROVE FOUNDATION RESTEEL SHOP DRAWINGS - 10	tank	4/27/93	5/10/93	5/13/93	5/26/93	10
22	024-REVIEW & APPROVE PAINT SPEC & COLOR SAMPLES - 10	tank	4/27/93	5/10/93	3/28/94	4/8/94	10
23	014-PDM MOBILIZE & MOVE ON SITE - 2	tank	5/3/93	5/4/93	5/18/93	5/19/93	2
24	023-REVIEW & APPROVE OUTSIDE UNDERGROUND PIPING SHOP DRAWINGS - 10	tank	5/4/93	5/17/93	7/16/93	7/29/93	10
25	040-REVIEW & APPROVE INTERIOR VALVE & PIPING SHOP DRAWINGS - 10	tank	5/4/93	5/17/93	8/27/93	9/10/93	10
26	054-REVIEW & APPROVE OVERHEAD DOOR SHOP DRAWINGS - 10	tank	5/4/93	5/17/93	9/10/93	9/23/93	10
27	057-REVIEW & APPROVE TELEMETRY SHOP DRAWINGS - 10	tank	5/4/93	5/17/93	10/13/93	10/26/93	10
28	056-REVIEW & APPROVE CATHODIC PROTECTION SHOP DRAWINGS - 10	tank	5/4/93	5/17/93	10/18/93	10/29/93	10
29	019-CONST TEMP ROAD, CLEAR SITE & LAYOUT PROJECT - 5	tank	5/5/93	5/11/93	5/20/93	5/26/93	5
30	026-FAB & DELIVER FOUNDATION RESTEEL - 10	tank	5/11/93	5/24/93	5/27/93	6/10/93	10
31	028-DELIVER INTERIOR & EXTERIOR PAINT - 10	tank	5/11/93	5/24/93	4/11/94	4/22/94	10
32	025-EXCAVATE FOR AUGER PILING & DRILL & FILL PILING - 10	tank	5/12/93	5/25/93	5/27/93	6/10/93	10
33	009-REVIEW & APPROVE TANK SHOP DRAWINGS - 10	tank	5/17/93	5/28/93	5/17/93	5/28/93	10
34	027-FAB & DELIVER UNDERGROUND PIPING OUTSIDE RING WALL - 15	tank	5/18/93	6/8/93	7/30/93	8/19/93	15
35	058-FAB & DELIVER INTERIOR VALVES & PIPING - 15	tank	5/18/93	6/8/93	9/13/93	10/1/93	15
36	060-FAB & DELIVER OVERHEAD DOOR - 15	tank	5/18/93	6/8/93	9/24/93	10/14/93	15
37	063-FAB & DELIVER TELEMETRY EQUIP & DEVICES - 15	tank	5/18/93	6/8/93	10/27/93	11/16/93	15
38	061-FAB & DELIVER CATHODIC PROTECTION EQUIP & DEVICES - 15	tank	5/18/93	6/8/93	11/1/93	11/19/93	15
39	029-EXCAV, FORM, REINF & POUR TANK FOOTINGS & RING WALL & VAULT - 20	tank	5/26/93	6/23/93	6/11/93	7/9/93	20
40	012-FAB & DELIVER TANK MATERIALS ADEQUATE TO START FIELD ERECTION - 33	tank	6/1/93	7/16/93	6/1/93	7/16/93	33

	activity	project	earliest start	earliest finish	latest start	latest finish	days
41	032-ROUGH BACKFILL & COMPACT FOUNDATION WALLS & VAULT - 5	tank	6/24/93	6/30/93	7/12/93	7/16/93	5
42	051-EXCAVATE, INSTALL & BACKFILL PIPING OUTSIDE RING WALLS - 15	tank	7/1/93	7/22/93	8/20/93	9/10/93	15
43	033-T/R TO START ERECT TANK - 07/29/93	tank	7/19/93	7/19/93	7/19/93	7/19/93	0
44	039-ERECT & WELD TANK - 54	tank	7/19/93	10/1/93	7/19/93	10/1/93	54
45	059-DPU EXCAVATE, INSTALL, TEST & BACKFILL NEW 20" LINE TO TANK - 15	tank	7/23/93	8/12/93	9/13/93	10/1/93	15
46	065-INSTALL OVERHEAD DOOR - 1	tank	10/4/93	10/4/93	10/15/93	10/15/93	1
47	066-CONSUMERS POWER INSTALL ELECTRIC SERVICE TO POLE - 5	tank	10/4/93	10/8/93	10/18/93	10/22/93	5
48	067-INSTALL PHONE SERVICE TO TANK- 5	tank	10/4/93	10/8/93	11/10/93	11/16/93	5
49	064-INSTALL INSIDE PIPING & VALVES - 10	tank	10/4/93	10/15/93	10/4/93	10/15/93	10
50	071-CONSTRUCT FLOOR SLAB ON GRADE - 5	tank	10/18/93	10/22/93	10/18/93	10/22/93	5
51	070-DPU DISINFECT SITE SERVICE TO VAULT - 5	tank	10/18/93	10/22/93	11/26/93	12/2/93	5
52	073-PART INSTALL INTERIOR ELECTRICAL WORK - 10	tank	10/25/93	11/5/93	10/25/93	11/5/93	10
53	075-DPU INSTALL TELEMETRY - 5	tank	11/8/93	11/12/93	11/17/93	11/23/93	5
54	074-COMP INSTALL INTERIOR ELECTRICAL WORK - 10	tank	11/8/93	11/19/93	11/8/93	11/19/93	10
55	076-ROUGH IN TANK CATHODIC PROTECTION - 2	tank	11/22/93	11/23/93	11/22/93	11/23/93	2
56	077-DISINFECT TANK & RISER PIPING & HYDRO TEST TANK - 6	tank	11/24/93	12/2/93	11/24/93	12/2/93	6
57	078-PUT TANK INTO TEMPORARY SERVICE - 1	tank	12/3/93	12/3/93	12/3/93	12/3/93	1
58	030-T/R TO SPRING WEATHER - 04/25/94	tank	4/25/94	4/25/94	4/25/94	4/25/94	0
59	035-PART PAINT TANK INTERIOR - 15	tank	4/25/94	5/13/94	4/25/94	5/13/94	15
60	034-PAINT TANK EXTERIOR - 30	tank	4/25/94	6/6/94	4/26/94	6/7/94	30

	activity	project	earliest start	earliest finish	latest start	latest finish	days
6 1	052-INSULATE BELOW CONDESATE CEILING - 10	tank	5/16/94	5/27/94	6/8/94	6/21/94	10
6 2	055-COMP PAINT TANK INTERIOR - 15	tank	5/16/94	6/6/94	5/16/94	6/6/94	15
6 3	062-INSTALL FINISH CATHODIC PROTECTION - 5	tank	6/7/94	6/13/94	6/7/94	6/13/94	5
6 4	053-RESTORE ROADWAY & SITE - 10	tank	6/7/94	6/20/94	6/8/94	6/21/94	10
6 5	068-DISINFECT WET INTERIOR - 6	tank	6/14/94	6/21/94	6/14/94	6/21/94	6
6 6	069-MAKE TANK OPERATIVE & BRING ON LINE - 1	tank	6/22/94	6/22/94	6/22/94	6/22/94	1

	activity	project	earliest start	earliest finish	latest start	latest finish	days
1	001-T/R TO APRIL 3, 1993	well field	4/3/93	4/3/93	4/5/93	4/5/93	0
2	005-CITY OF KALAMAZOO PROVIDE PREIN & NEWHOF SET OF FRONT END SPECS - 4	well field	4/5/93	4/8/93	9/1/93	9/7/93	4
3	006-DPU REVIEW & APPROVE ARCH DESIGN OF TREATMENT PLANT - 10	well field	4/5/93	4/16/93	8/23/93	9/3/93	10
4	007-MAKE APPRAISELS OF SANITARY SEWER PROPERTY - 20	well field	4/5/93	4/30/93	4/5/93	4/30/93	20
5	004-COMP PREP & SUBMIT 80% COMP REVIEW SET TO DPU & MDPH - 21	well field	4/5/93	5/3/93	8/20/93	9/20/93	21
6	003-DNR REVW AIR QUALITY APPLIC, APPROVE, MAKE RECOMMENDTNS & SET PUBLIC HEARING DATE - 88	well field	4/5/93	8/6/93	4/5/93	8/6/93	88
7	011-PREIN & NEWHOF PREP & SUBMIT SET OF FRONT END SPECS TO KALAMAZOO DPU - 4	well field	4/9/93	4/14/93	9/8/93	9/13/93	4
8	014-DPU & COK LEGAL REVIEW & COMMENT ON P & N'S FRONT END SPECS - 20	well field	4/15/93	5/12/93	9/14/93	10/11/93	20
9	012-PREPARE ARCH DESIGN PRESENTATION PACKAGE OF TREATMENT PLANT - 15	well field	4/19/93	5/7/93	9/7/93	9/27/93	15
10	013-COK PREPARE & SUBMIT OFFER ON SANITARY SEWER PROPERTY - 10	well field	5/3/93	5/14/93	5/3/93	5/14/93	10
11	009-DPU REVIEW & COMMENT ON 80% COMP SET - 15	well field	5/4/93	5/24/93	9/21/93	10/11/93	15
12	010-MDPH REVIEW & COMMENT ON 80% COMP SET - 15	well field	5/4/93	5/24/93	9/21/93	10/11/93	15
13	016-MEET WITH NEIGHBORS & OBTAIN COMMENTS ON TREATMENT PLANT ARCH DESIGN - 10	well field	5/10/93	5/21/93	9/28/93	10/11/93	10
14	017-OWNER ACCEPT COK OFFER ON SANITARY SEWER PROPERTY - 15	well field	5/17/93	6/7/93	5/17/93	6/7/93	15
15	019-CITY COMMISSION REVW & APPRV PURCHASE OF SANITARY SEWER PROPERTY - 20	well field	6/8/93	7/6/93	6/8/93	7/6/93	20
16	020-CLOSE ON SANITARY SEWER PROPERTY PURCHASE - 10	well field	7/7/93	7/20/93	7/7/93	7/20/93	10
17	008-TIME RESTRAINT FOR DNR AIR QUALITY PUBLIC HEARING WAITING PERMIT - 22	well field	8/9/93	9/8/93	8/9/93	9/8/93	22
18	015-DNR HOLD PUBLIC HEARING ON AIR QUALITY - 1	well field	9/9/93	9/9/93	9/9/93	9/9/93	1
19	018-DNR ISSUE AIR QUALITY PERMIT - 22	well field	9/10/93	10/11/93	9/10/93	10/11/93	22
20	021-COMP PREPARE & SUBMIT 100% COMP REVIEW SET TO DPU & MDPH - 15	well field	10/12/93	11/1/93	10/12/93	11/1/93	15
21	023-DPU REVIEW & APPROVE 100% COMP REVIEW SET - 15	well field	11/2/93	11/22/93	11/2/93	11/22/93	15
22	024-MDPH REVIEW & APPROVE 100% COMP REVIEW SET - 15	well field	11/2/93	11/22/93	11/2/93	11/22/93	15

	activity	project	earliest start	earliest finish	latest start	latest finish	days
23	025-ADVERTISE IN PUBLICATIONS FOR PROJECT - ?	well field	11/22/93	11/22/93	11/22/93	11/22/93	0
24	026-PRINT & ISSUE CONSTRUCTION DOCUMENTS FOR PROPOSALS - 2	well field	11/23/93	11/24/93	11/23/93	11/24/93	2
25	028-CONTRACTORS PREPARE PROPOSALS UP TO PRE BID MEETING DATE - 13	well field	11/26/93	12/14/93	11/26/93	12/14/93	13
26	029-HOLD PRE BID MEETING -1	well field	12/15/93	12/15/93	12/15/93	12/15/93	1
27	030-CONTRACTORS COMP PREPARE & SUBMIT PROPOSALS - 8	well field	12/16/93	12/28/93	12/16/93	12/28/93	8

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June 17, 1993

Subject: Kalamazoo Department of Utilities management report #4

To: Kenneth P. Collard, P. E. - Director DPU

From: Ralph J. Stephenson, P. E. - Consultant

Project: 92:52

Disk #: 339

Date of meetings: Thursday, June 16, 1993 (wd 629)

Those attending:

A. M.

- Jerri Barnett-Moore - Finance, Department of Public Utilities
- Steven Stout - Deputy Manager, Management Information Services
- Ralph J. Stephenson - Consultant

P. M.

- Pat DiGiovanni - Deputy City Manager
- Kenneth P. Collard - Director of Utilities
- Jim Gallogly - Director of Public Works
- Ralph J. Stephenson - Consultant

Actions taken:

A. M.

- Reviewed current status of DPU management information services (MIS) program.
- Discussed concepts of independent and merged MIS systems.
- Reviewed characteristics of single and multiple purpose plans.
- Identified interrelations of DPU and City systems.
- Prepared graphic model of the DPU-City interrelationships

P.M.

- Discussed current status of new DPW facility design.
- Reviewed concepts of pro forma analysis.
- Reviewed concept of the iterative estimate to provide design constraints and discipline.
- Discussed cash flow during the various stages of a project.
- Prepared preliminary laundry list and network model for next two or three months.

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General Summary:

A. M. - June 16, 1993

The main subject of the morning meeting concerned interfacing the DPU's and the City's MIS operations. The DPU has been authorized by the City Manager to have a DPU MIS needs study prepared. This plan will help determine the future configuration of the DPU system and how it interrelates to the City system.

We discussed the concept of the DPU study being a single purpose analysis of the needs of the DPU. Concurrently the City MIS department is also conducting a study to determine the total needs of the City of Kalamazoo for serving the departments and divisions, and Kalamazoo residents.

Once the two studies are completed the City MIS staff will merge them, and select a suitable configuration and system in conjunction with the DPU staff.

Our discussion centered on how to assemble a system that would combine the best features of the current mode of close local management of the hardware and software, as is maintained by many of the departments and divisions with the best features of central data and applications access. The former was termed the independent system, the latter was termed the consolidated system.

We were able to isolate the major conceptual components of the total system and using simple flow chart techniques, placed the components where they could be most effectively used within the total MIS configuration. The result of this discussion is shown in Attachment A, issue #2, dated June 18, 1993. The diagram should be carefully reviewed and revised where necessary before general distribution and use.

The purpose of the afternoon meeting was to review the current planning and design status of the proposed DPW facility to be built. Some early architectural floor plans have been prepared in accordance with a preliminary program given to the architect/engineer by the city. However, current considerations of possible shared facilities have made it advisable to put the design work on hold temporarily.

We discussed the methods of establishing a budget for the project using financial pro forma techniques in which an affordable capital cost is set from which the entire project is planned, designed and built. This is usually called the pro forma (or according to form) method.

In our discussions a wide range of affordable costs from $3.2 million to $4.0 million were mentioned. The actual to-be-used targets should be set early so as to provide the architect/engineer a cost/design guideline within which to work.

As the discussion proceeded it was suggested that a model of the work to be done over the next few months be built to guide the analysis of the project from now through the release of the architect/engineer to proceed with preparation of full construction documents.

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A random laundry list of activities to be done in this time period was prepared, and Mr. Collard and I diagramed a portion of the network plan from this list. We were not able to complete the full network model due to time constraints. We did, however, complete the early portion of the logic plan, and assigned responsibilities and durations to the activities.

The network model was printed and distributed at the meeting. Both the laundry list and the network model should be reviewed and extended in the very near future. I shall discuss this with Mr. Collard. I suggest the network be for top staff member use only until work shown can be extended.

There are several very important actions included in the network model, Attachment B. Below I have given a brief description of these as a help in better understanding the work to be done. Please note the activity numbers referenced below are shown preceding the action description in each activity box.

- 08 - DEFINE USES OF EXISTING DPU & DPW FACILITIES AS AFFECTED BY SHARED FACILITY DESIGN - A listing of the properties, the buildings, the major equipment, and other resources of the Department of Utilities and the Department of Public Works, whose use will influence or be influenced by construction of the new facility.

- 01 - ESTABLISH PRO FORMA RESTRAINTS ON ON PROJECT CAPITAL COSTS - The pro forma sets the amount of the capital investment derived from the income or allocations expected measured against the expenses of operating the facility. The pro forma restraints are the parameters within which the pro forma analysis must be made.

- 09 - MAKE PRO FORMA ANALYSIS TO SET ALLOWABLE CAPITAL PROGRAM EXPENDITURE - From the restraints and conditions set by activity 01, the actual financial analysis is made from which the allowable capital expenditures, and other financial needs for the facility are determined from money available minus operating costs for the facility.

- 02 - DEFINE CURRENT STAFFING LEVELS OF DPU - A tabulation of the number of Department of Utilities staff members who occupy the facilities listed in activity number 08. Included in this should be a brief description of what the various staff members do.

- 03 - DEFINE CURRENT STAFFING LEVELS OF DPW - A tabulation of the number of Department of Public Works staff members who occupy the facilities listed in activity number 08. Included in this should be a brief description of what the various staff members do.

- 04 - CATALOG EXISTING DPU AND DPW FUNCTIONS - A detailed listing of what each of the operating line and staff functional groups in the DPU and the DPW do in performing their day to day duties. This listing should be oriented toward describing things that are done that influence how the new building is to be designed and used.

- 10 - PREPARE LIST OF INTERNAL FUNCTIONAL GROUPS - This action consolidates existing functions into major functional groups that might best operate as a unit by virtue of the intuitive and

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historical density of the interrelations. This is the first pass at setting the actual physical location of the various functions and the staff that does them.

• 05 - ESTABLISH BENEFIT/COST ANALYSIS TECHNIQUE TO BE USED (STANDARDS TO BE USED) - If we assume benefit/cost means a comparative measure of the benefits to be gained at a cost, there must be some standards by which the benefits are given a value, and standards set by which the value is measured against what is desired and what can be afforded. These are then blended into technique of analysis that allows the highest benefit/cost ratios to be achieved.

The detailed description of this process and methodology is the benefit/cost analysis technique.

• 06 - REVIEW CURRENT PROGRAM STATEMENTS FOR VALIDATION OR REVISION - A detailed check of the basis upon which the current design has been formulated. This includes a review of the building areas needed, functions of the spaces, expansion needs, location of the facility on the site, influence of the new facility on existing facilities use or disposition, and all other major considerations that will impact on the planning, design, construction and operation of the new facility.

Included in the review should be consideration of target capital costs, allowable operating costs, future expansion, and many more. In essence, here we are making a detailed check of the current program for the building.

• 07 - DETERMINE EXTENT OF REMEDIATION REQUIRED AS DETERMINED BY PHASE 1 STUDY - There may be site conditions that will require abatement or remediation. These potential deterrents or obstacles to construction of the new facility should be determined very early and steps taken to remediate before starting construction.

• 11 - DETERMINE APPROXIMATE COST OF REMEDIATION - From the REMEDIATION scope definition, the cost of the remediation must be estimated. This may or may not influence the pro forma analysis being made in activities 01 and 09.

The two have not been interrelated in this preliminary network. It may be desirable to do so in the updating of issue #1.

• 12 - SET SPACE & USE OCCUPANCY STANDARDS - Each function and person performing the function ultimately occupies working and non working space somewhere inside or outside the proposed facility. The standards for assigning space is important for determining present and ultimate sizes of internal and external work areas.

• 13 - DEFINE 1, 2 AND 4 YEAR PROJECTED STAFFING LEVELS FOR DPU & DPW - Concurrent with setting use standards, the staffing needs for the facility must be determined. The one year needs bring the staff levels from now to about the point of final design and award of contract. They are probably very similar to current levels.

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The two year level is what is anticipated by completion of the facility and move in.

The four year level is what might be anticipated as the new building is run in and put into operation. It also should indicate any expected major deviation from the one and two year levels so these can be anticipated in the initial design of the facility.

• 14 - IDENTIFY POTENTIAL DENSITY OF INTERACTION AMONG AFFECTED GROUPS (MATRIX) - As the staffing levels are determined, the density of relations between and among functional units should be estimated. At this stage the relational density can be most conveniently estimated by a tempered subjective evaluation by all levels of management as to the levels of communication and expressed influence between the major functional elements and their components.

I suggest for the initial analysis that density relations use 5 levels:

level 1 - no interrelation
level 2 - very few interrelations
level 3 - moderate interrelations
level 4 - medium high interrelations
level 5 - constant interrelations

The standards for assigning interrelation density should be set by all levels of management under the leadership of top management.

• 15 - ESTABLISH DESIRED FUNCTIONAL RELATIONSHIPS - The actual desired functional relations should next be derived from the estimated staffing levels and potential density levels expected. This is a top and middle management function and is critical to the proper design of the facility.

The product of this activity is a locational, quantified foot print of the facility, often called a bubble chart, to rough scale showing how the functional units should fit within the physical limits of the new facility to provide optimum operational effectiveness.

• 16 - PAPER & DISCUSS ORGANIZATIONAL MODELS FOR FACILITY OCCUPANTS - The nature of any shared facility use demands that the management needs of the operations being conducted in the shared space be managed properly. The purpose of this activity is to determine what management model and mode is most appropriate for the use of the new shared facility.

• 17 - DEFINE GEOGRAPHIC OPERATING LIMITS AND HOME BASES FOR FUNCTIONAL UNITS - This activity is designed to encourage a reevaluation of the operating characteristics of the functional units and the entire DPW and DPU departments as affected by the new facility being on line.

The above summary descriptions are intended only as guidelines to the facilities design and construction

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operations that might be appropriate over the next two months.

I believe your architect/engineer should be involved in as many of the steps as he feels appropriate, and that his current fee allocation allows.

In summary I recommend:

1. That the Sheet #01, issue 1 network model, dated June, 17, 1993 be reviewed thoroughly and the actions shown be undertaken immediately. The interim, needs study project manager might be best selected from upper or upper middle management of the DPU and/or DPW.

2. That within the next month the current plan of work shown on Sheet #01, be expanded, updated and that the information developed within the month period merged into the plan of action.

3. That those early assignable actions from 01 to 08 be started immediately by those assigned the responsibility for doing, or having them done.

I shall be in touch with Mr. Collard soon to determine the next step in which I might be of help in working with the DPU staff and others in the most effective manner.

Attachments:

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July 30, 1993

Subject: Kalamazoo Department of Utilities management report #5

To: Kenneth P. Collard, P. E. - Director DPU

From: Ralph J. Stephenson, P. E. - Consultant

Project: 92:52

Disk #'s: 339 and 377

Monitored from:
• Issue #1, sheet #01 City Yards Facility Analysis network, dated June 17, 1993 (wd 629).

Date of meeting: Friday, July 16, 1993 (wd 649)

Those attending:

A. M. meeting

• Kenneth P. Collard - Director of Utilities
• Pat DiGiovanni - Deputy City Manager
• Jim Gallogly - Director of Public Works
• Ralph J. Stephenson - Consultant

P. M. meeting

• Frank Szopo, P. E. - Utilities Engineering Manager
• Ralph J. Stephenson, P. E. - Consultant

Actions taken:

A. M. meeting

• Reviewed current status of new DPW facility design.
• Discussed DPW facility cash flow and relation to capital expenditure.
• Continued preparing laundry list and network model for DPW facility actions. over next several months.

P. M. meeting

• Reviewed current status of Oshtemo water tank project.
• Discussed and analyzed foundation problem being encountered.

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July 30, 1993

DPW Facility:

The purpose of the morning meeting was to review the current programming, planning, and design status of the proposed DPW facility.

Current considerations and programming work for the facility have made it advisable to temporarily put full architectural and engineering design work for the facility on hold.

We also reviewed various methods of setting a capital cost and funding the project. In our discussions a range of affordable costs were considered. The range of these costs is considerable at this time, and it was agreed by all involved that acceptable cost parameters should be set as quickly as possible to provide the architect/engineer a set of guidelines within which to work.

The need for swift action is stimulated by the fact that construction of the facility, even if started now, could experience increasing costs because without full close in of the building by about late November, 1993, temporary close in, and temporary heat will probably be needed. Temporary close in and heat is very expensive .

We next monitored the project from the issue # 1 network model, Sheet #01, dated June 17, 1993 (wd 629), and then updated this issue #1 network, revising the plan of work as felt desirable from the comments of Mr. DiGiovanni, Mr. Collard and Mr. Gallogly. A brief review of the status of each activity as of July 16, 1993 (wd 649) is given below. Numbers preceding the activity are the activity numbers used to identify the activities in the issue #01 network model

- 08 - DEFINE USES OF EXISTING DPU & DPW FACILITIES AS AFFECTED BY SHARED FACILITY DESIGN - 70% complete.

  List is substantially complete. Must be merged and put into final form. To be completed by the pm of Thursday July 22, 1993 (wd 654).

- 01 - ESTABLISH PRO FORMA RESTRAINTS ON PROJECT CAPITAL COSTS - 100 % complete.

- 09 - MAKE PRO FORMA ANALYSIS TO SET ALLOWABLE CAPITAL PROGRAM EXPENDITURE. - 40% complete.

  In work at present. The DPW and DPW analyses are being done now and will be substantially complete by July 23, 1993 (wd 654).

- 02 - DEFINE CURRENT STAFFING LEVELS OF DPU. - 100% complete.

- 03 - DEFINE CURRENT STAFFING LEVELS OF DPW. - 100% complete.

- 04 - CATALOG EXISTING DPU AND DPW FUNCTIONS. - 75% complete.

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July 30, 1993

DPW and DPU have tabulated major functions. Will add relation of the function to the building uses.

• 10 - PREPARE LIST OF INTERNAL FUNCTIONAL GROUPS - 50% complete.

DPU has begun work on this list.

• 05 - ESTABLISH BENEFIT/COST ANALYSIS TECHNIQUE TO BE USED (STANDARDS TO BE USED) - 75%.

Not started formally. However factors in the analysis have been partially identified.

• 06 - REVIEW CURRENT PROGRAM STATEMENTS FOR VALIDATION OR REVISION - 40% complete.

DPU and DPW currently reviewing program statements.

• 07 - DETERMINE EXTENT OF REMEDIATION REQUIRED AS DETERMINED BY PHASE 1 STUDY - 20% complete.

An estimate of the cost has been made. Must be refined.

• 11 - DETERMINE APPROXIMATE COST OF REMEDIATION.

Not started as of July 16, 1993 (wd 649).

• 12 - SET SPACE & USE OCCUPANCY STANDARDS.

Not started as of July 16, 1993 (wd 649).

• 13 - DEFINE 1, 2 AND 4 YEAR PROJECTED STAFFING LEVELS FOR DPU & DPW.

Not started as of July 16, 1993 (wd 649).

• 14 - IDENTIFY POTENTIAL DENSITY OF INTERACTION AMONG AFFECTED GROUPS (MATRIX).

Not started as of July 16, 1993 (wd 649).

• 15 - ESTABLISH DESIRED FUNCTIONAL RELATIONSHIPS.

Not started as of July 16, 1993 (wd 649).

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- 16 - PREPARE & DISCUSS ORGANIZATIONAL MODELS FOR FACILITY OCCUPANTS.

Not started as of July 16, 1993 (wd 649).

- 17 - DEFINE GEOGRAPHIC OPERATING LIMITS AND HOME BASES FOR FUNCTIONAL UNITS.

As of July 16, 1993 (wd 649) the project appears to lag the issue #01 model dated June 17, 1993 (wd 630) model by about 14 working days.

We updated the model and a copy was provided to those attending for further study and use. A copy of the monitored network is enclosed with this report and is labeled **Attachment A.** A copy of the updated network model is also enclosed, and labeled **Attachment B.**

To help identify considerations impacting possible courses of remediation that may be needed, Mr. Collard, Mr. DiGiovanni, Mr. Gallogly, and I also prepared a decision tree showing each decision step that might be taken. This is enclosed as **Attachment C.** I recommend the tree be given careful study to determine the best decision in this matter. At present it appears that the path from 001 through either 009 or 013 will be the actions taken. 009 or 013 will be selected once the action in 007 is taken.

Oshtemo Tank Project:

In the afternoon Mr. Szopo and I reviewed the status of the Oshtemo water storage tank construction. A network model showing the current status of the work is enclosed and labeled **Attachment D.** This network is sent as separate sheets to facilitate duplication.

Currently the project is underway in the field but has encountered several problems. Mobilization and move on site started June 15, 1993 (wd 627) according to Mr. Szopo. The site was cleared, the access road built, and excavation started. Meanwhile a decision had been made on June 4, 1993 (wd 620) to use H piles in place of auger piling.

As work on the foundations began, some difficulty was encountered in achieving pile capacity specified at the expected depth of the piling. To sort out the various alternatives available to the design and construction team Mr. Szopo and I prepared a decision tree identifying the major alternative courses of action possible. This is enclosed as **Attachment E.** This is a preliminary document and must be analyzed in detail.

Also in mid July, 1993, flooding at the Des Moines plant of the tank fabricator forced a shut down of the plant, and stopping fabrication of the tank materials. There is no current word on when the plant will restart.

Thus as of the monitoring date, pile driving, and tank foundation work are held or slowed pending items as reviewed above.

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July 30, 1993

I prepared a preliminary updating of the network model, sheet #01, issue #1, dated April 2, 1993 (wd 576). This update was projected from the current status of the work, and assumed that both pile driving and tank fabrication would restart on July 16, 1993 (wd 649). This updated network model is enclosed and labeled **Attachment E.**

Attachments D, E, and F are being sent to Mr. Collard for further distribution as he and Mr. Szopo feel appropriate. I suggest Mr. Szopo be provided a copy of these attachments for his further study and action.

I shall be in touch with Mr. Collard soon to determine the next step in which I might be of help in working with the DPU staff and others in the most effective manner.

Attachments A through E:

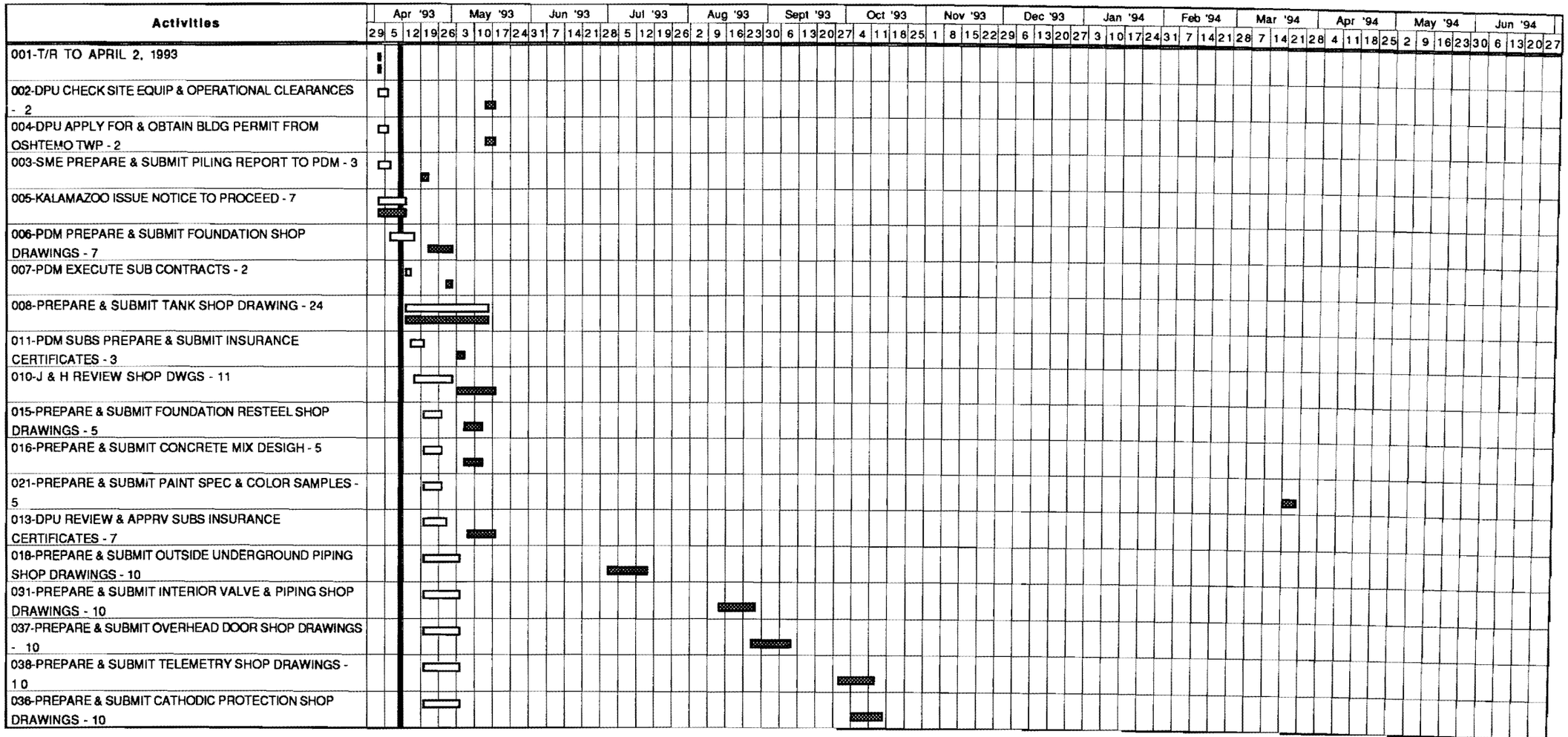
Ralph J. Stephenson, P. E.

Department of Public Utilities

Attachment B - Oshtemo Water Storage Tank Project, Kalamazoo, Michigan

Derived from network model - sheet O1, issue #2 dated April 5, 1993

Saturday, April 10, 93



- Open bar - early starts & early finishes
- Shaded bar - late starts & late finishes

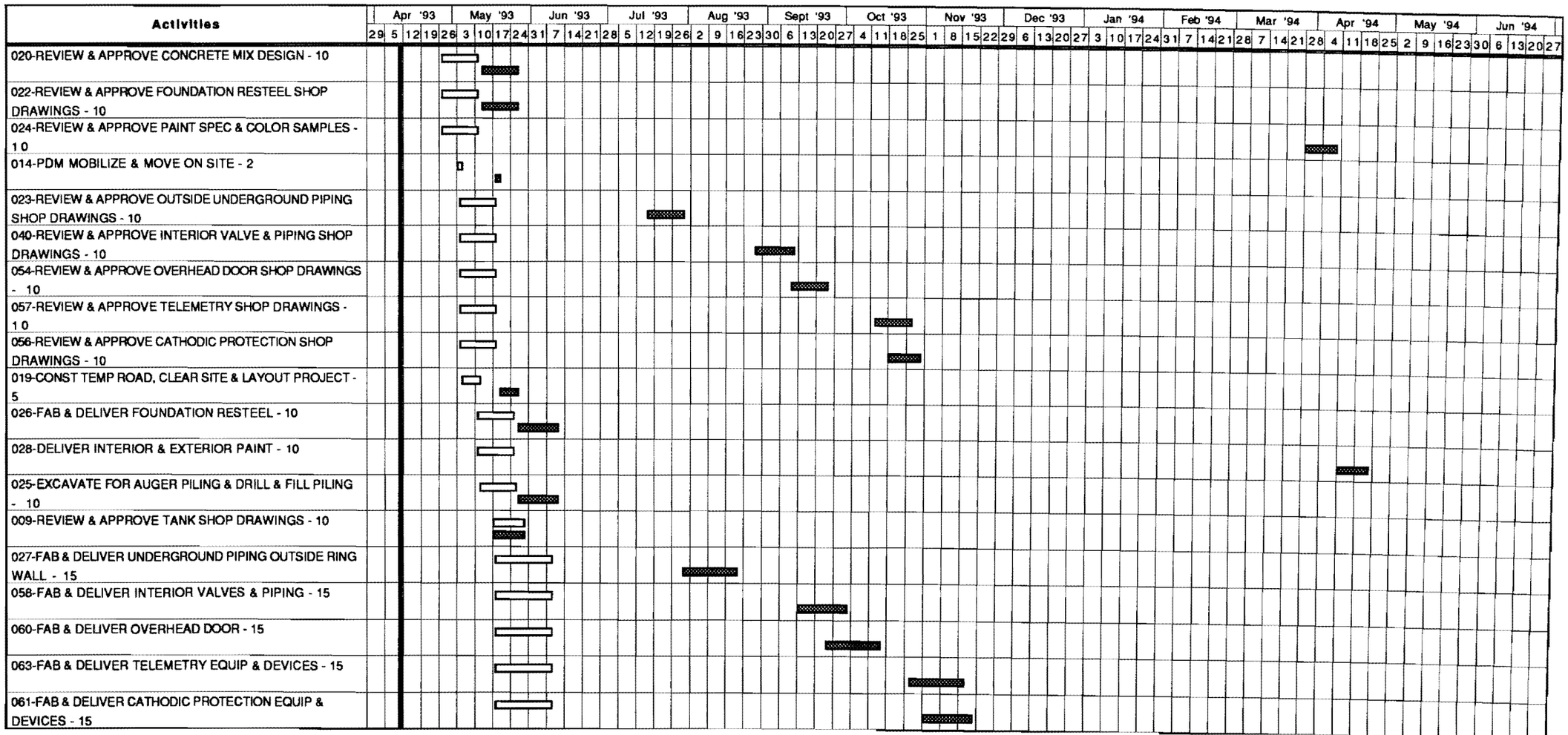
lsr 55% - disk 339

Department of Public Utilities

Attachment B - Oshtemo Water Storage Tank Project, Kalamazoo, Michigan

Derived from network model - sheet O1, issue #2 dated April 5, 1993

Saturday, April 10, 93



- Open bar - early starts & early finishes
- Shaded bar - late starts & late finishes

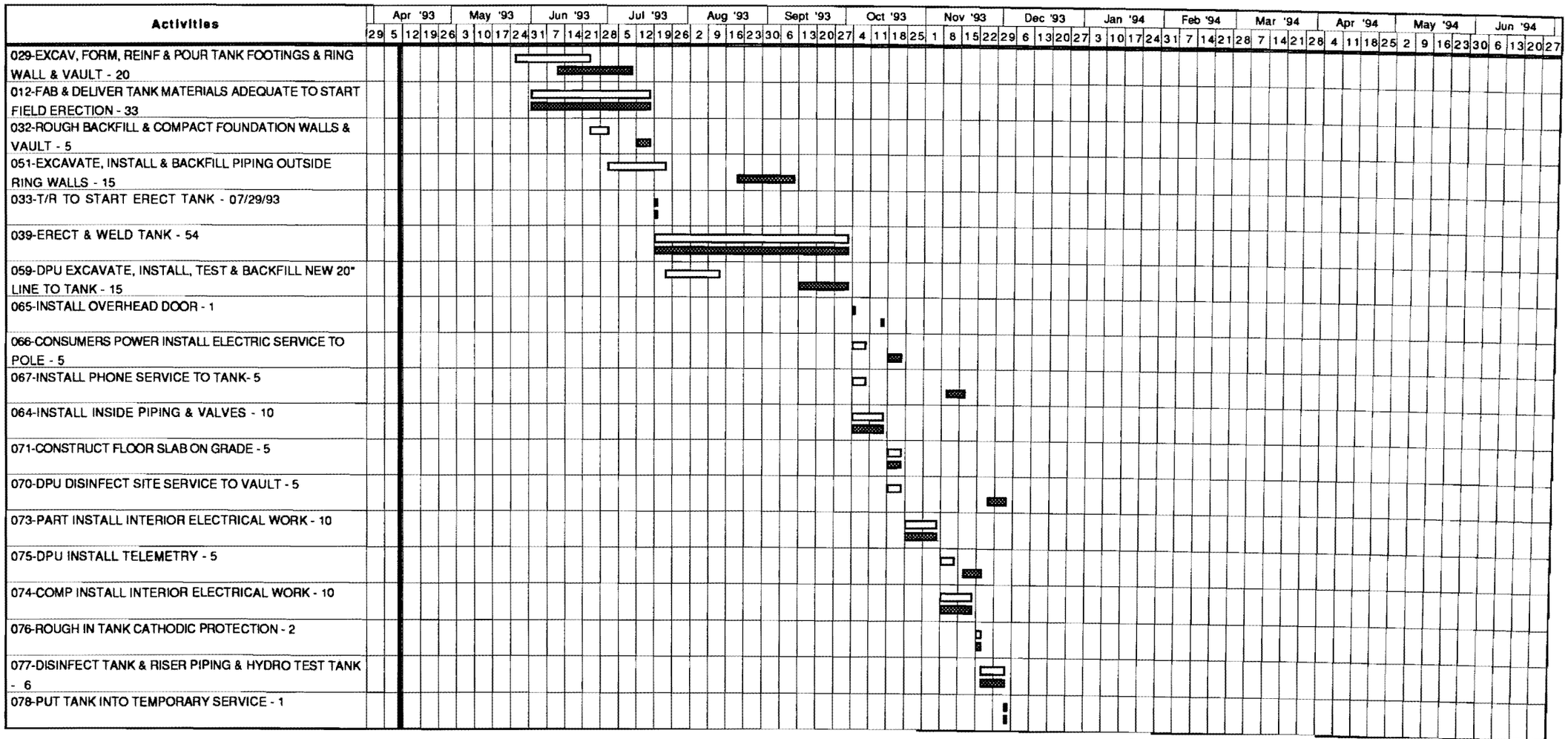
lsr 55% - disk 339

Department of Public Utilities

Attachment B - Oshtemo Water Storage Tank Project, Kalamazoo, Michigan

Derived from network model - sheet O1, issue #2 dated April 5, 1993

Saturday, April 10, 93



- Open bar - early starts & early finishes
- Shaded bar - late starts & late finishes

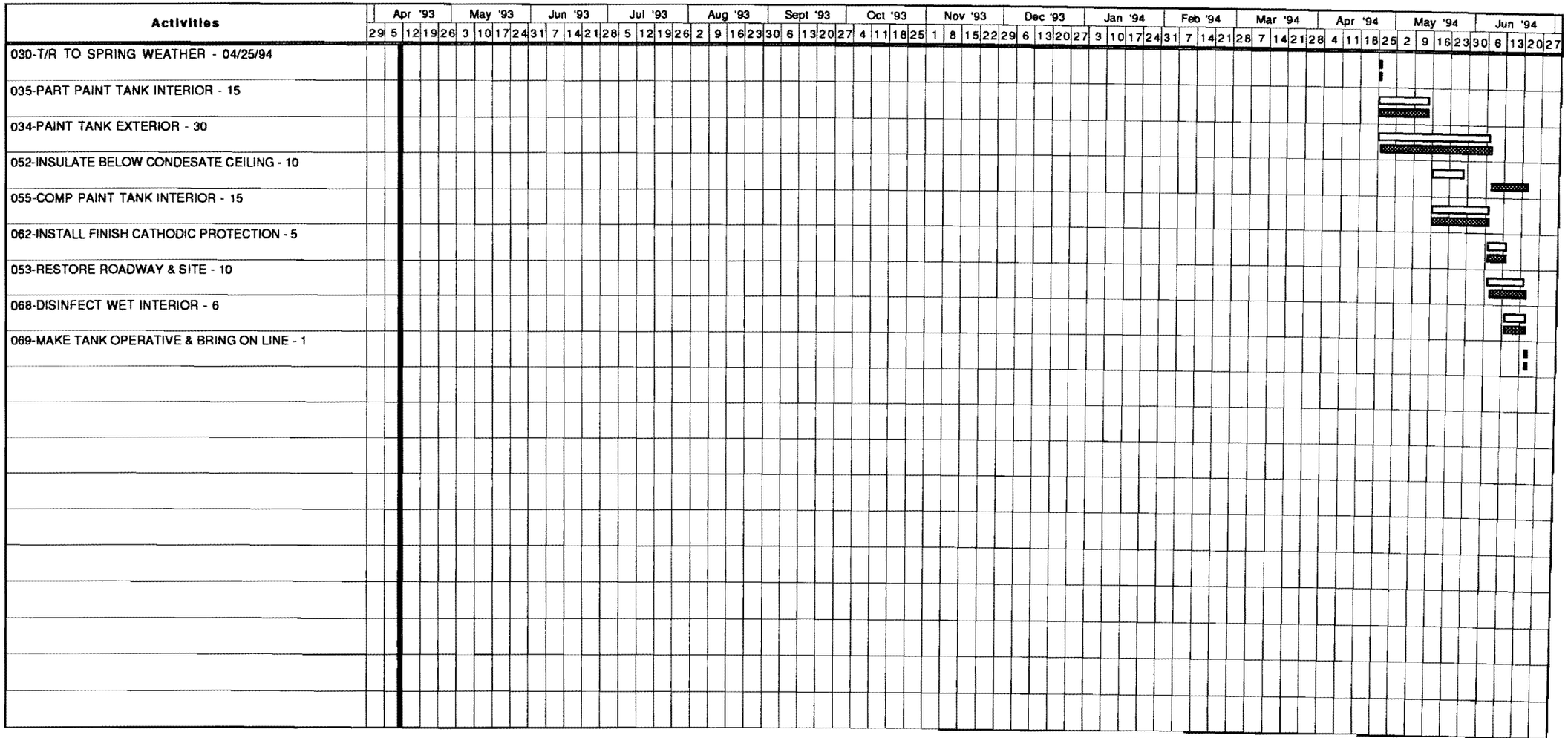
lsr 55% - disk 339

Department of Public Utilities

Attachment B - Oshtemo Water Storage Tank Project, Kalamazoo, Michigan

Derived from network model - sheet O1, issue #2 dated April 5, 1993

Saturday, April 10, 93



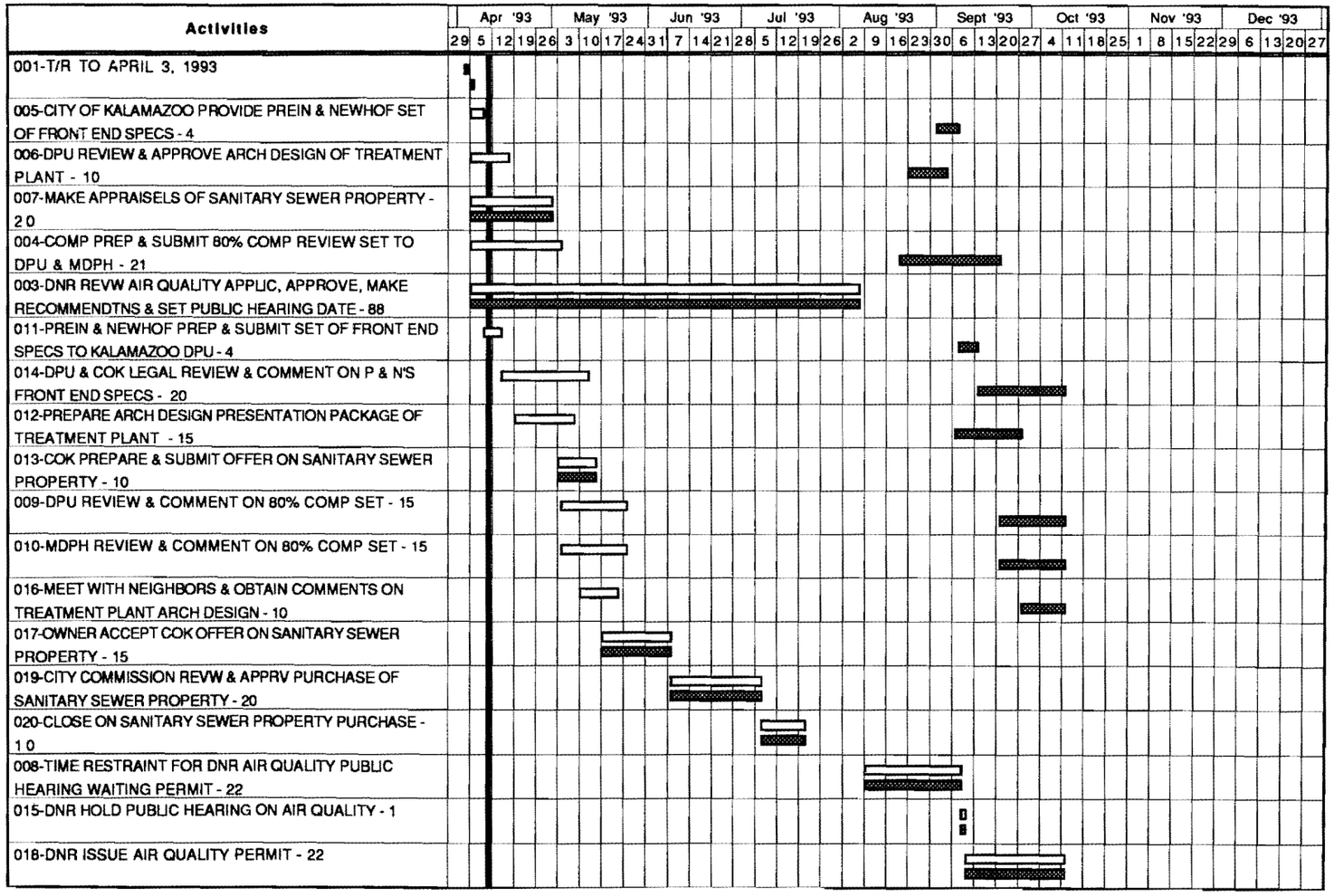
- Open bar - early starts & early finishes
- Shaded bar - late starts & late finishes

lsr 55% - disk 339

Department of Public Utilities

Attachment E - Central Well Field Complex, Kalamazoo, Michigan

Saturday, April 10, 93



Derived from network model - sheet W1, issue #2 dated April 9, 1993

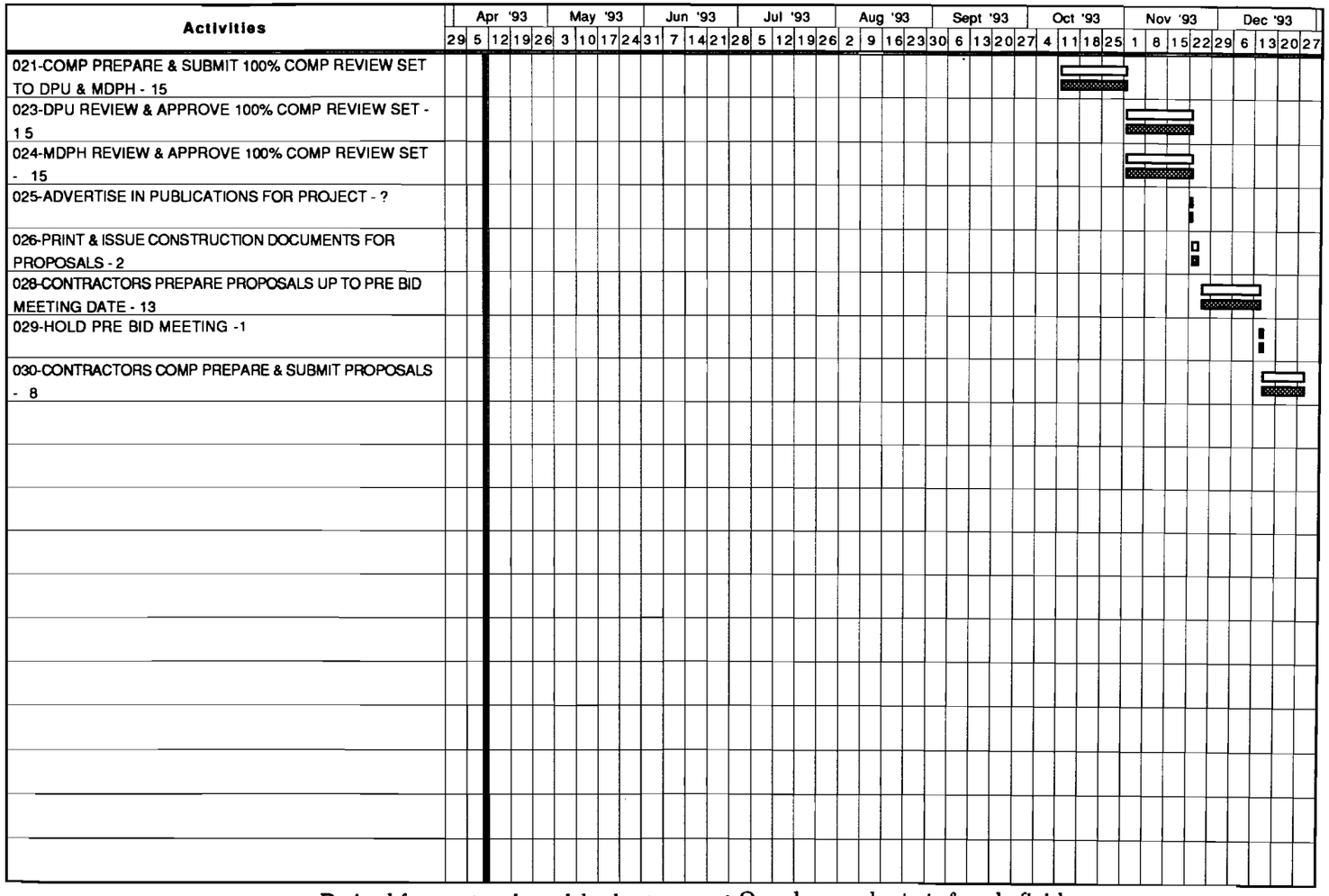
- Open bar - early starts & early finishes
- Shaded bar - late starts & late finishes

lsr 55% - disk 339

Department of Public Utilities

Attachment E - Central Well Field Complex, Kalamazoo, Michigan

Saturday, April 10, 93



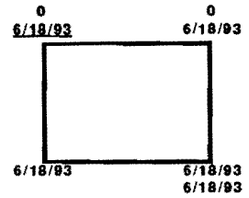
Derived from network model - sheet W1, issue #2 dated April 9, 1993

- Open bar - early starts & early finishes
- Shaded bar - late starts & late finishes

lsr 55% - disk 339

% complete
Early start

Duration
Early finish



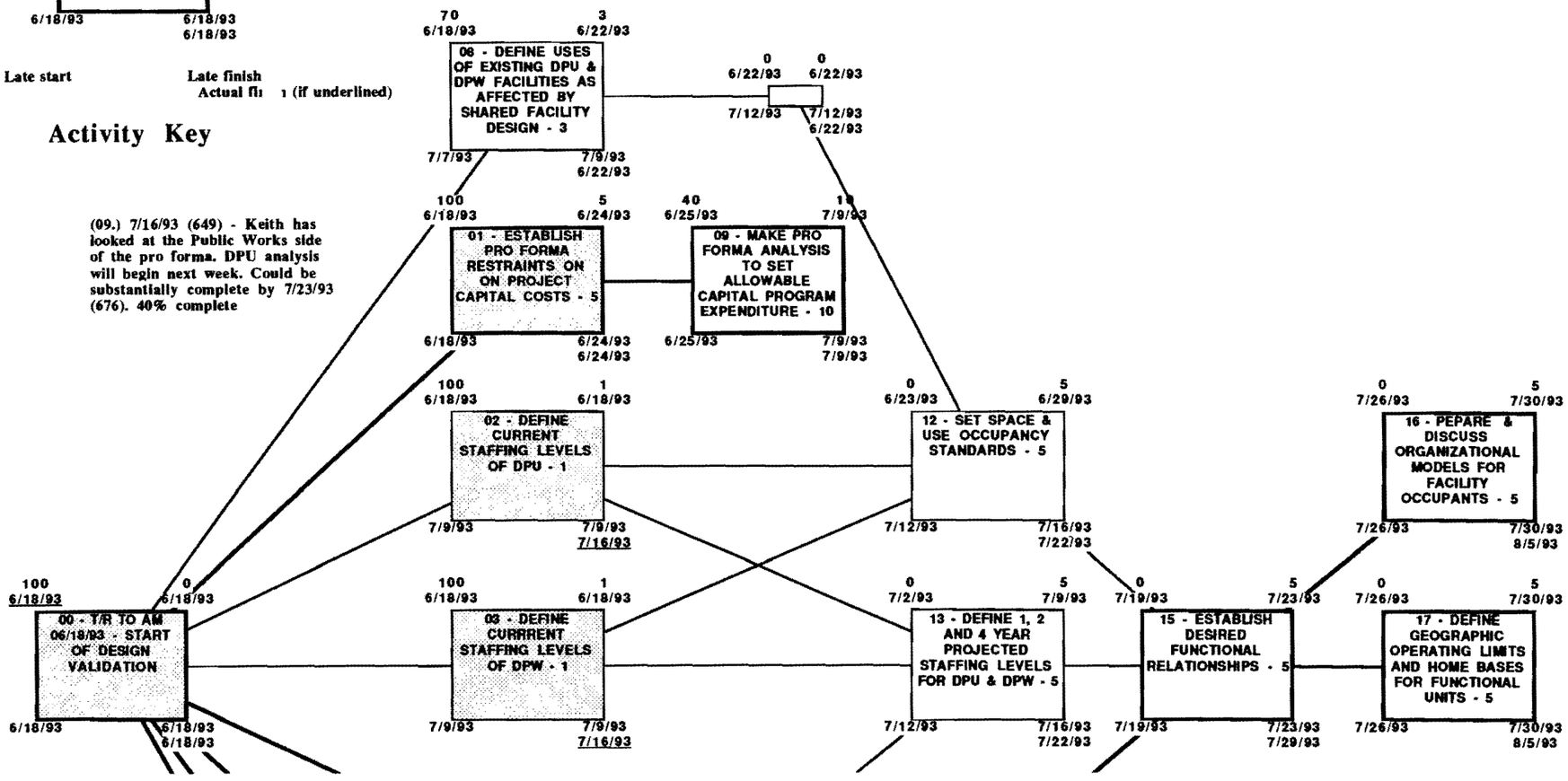
Late start

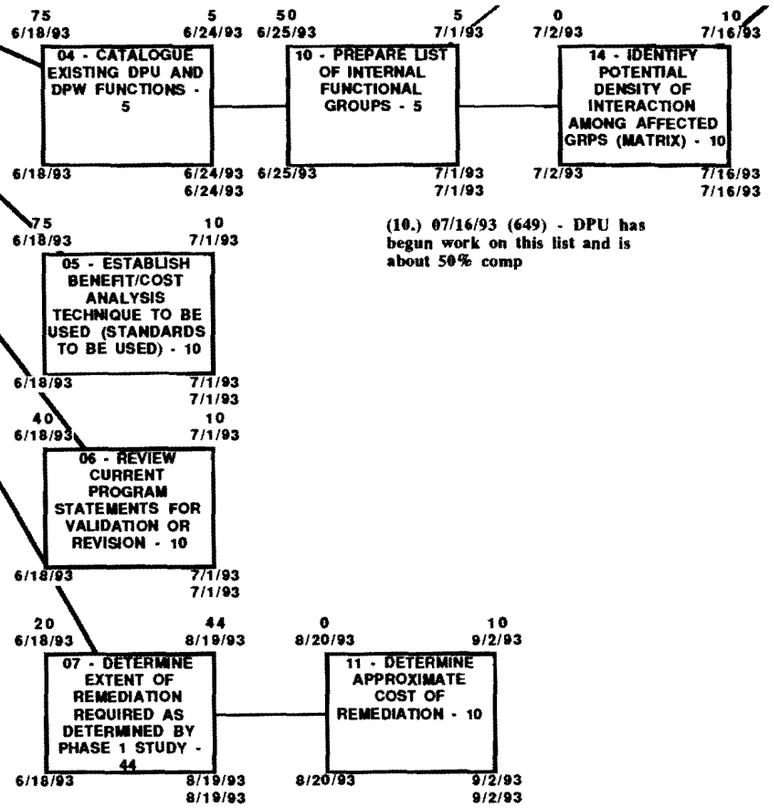
Late finish
Actual fi ı (if underlined)

Activity Key

(08.)7/16/93 (649) - List complete - must be merged & put in final form - 70% complete. Will probably be completed by pm Thursday, July 22, 1993 (654)

(09.) 7/16/93 (649) - Keith has looked at the Public Works side of the pro forma. DPU analysis will begin next week. Could be substantially complete by 7/23/93 (676). 40% complete





(04.) 07/16/93 (649) - DPW has listed functions - will add relation of the function to the building uses - 75%.

DPU has listed functions - will add the relation of the functions to the building uses - 75%

(10.) 07/16/93 (649) - DPU has begun work on this list and is about 50% comp

(05.) 7/16/93 (649) - Not started formally - will be completed by ?

(06.) - 7/16/93 (649) - Jim & Ken currently reviewing the statements - 40%

(07.) - 7/16/93 (649) - An estimate of the cost of required remediation testing has been made - 20%

Activities or requirements to add
- Define what a benefit is.

Reserved Activity Numbers

041	046
042	047
043	048
044	049
045	050

Project Status as of July 17, 1993

lan 001
han ?

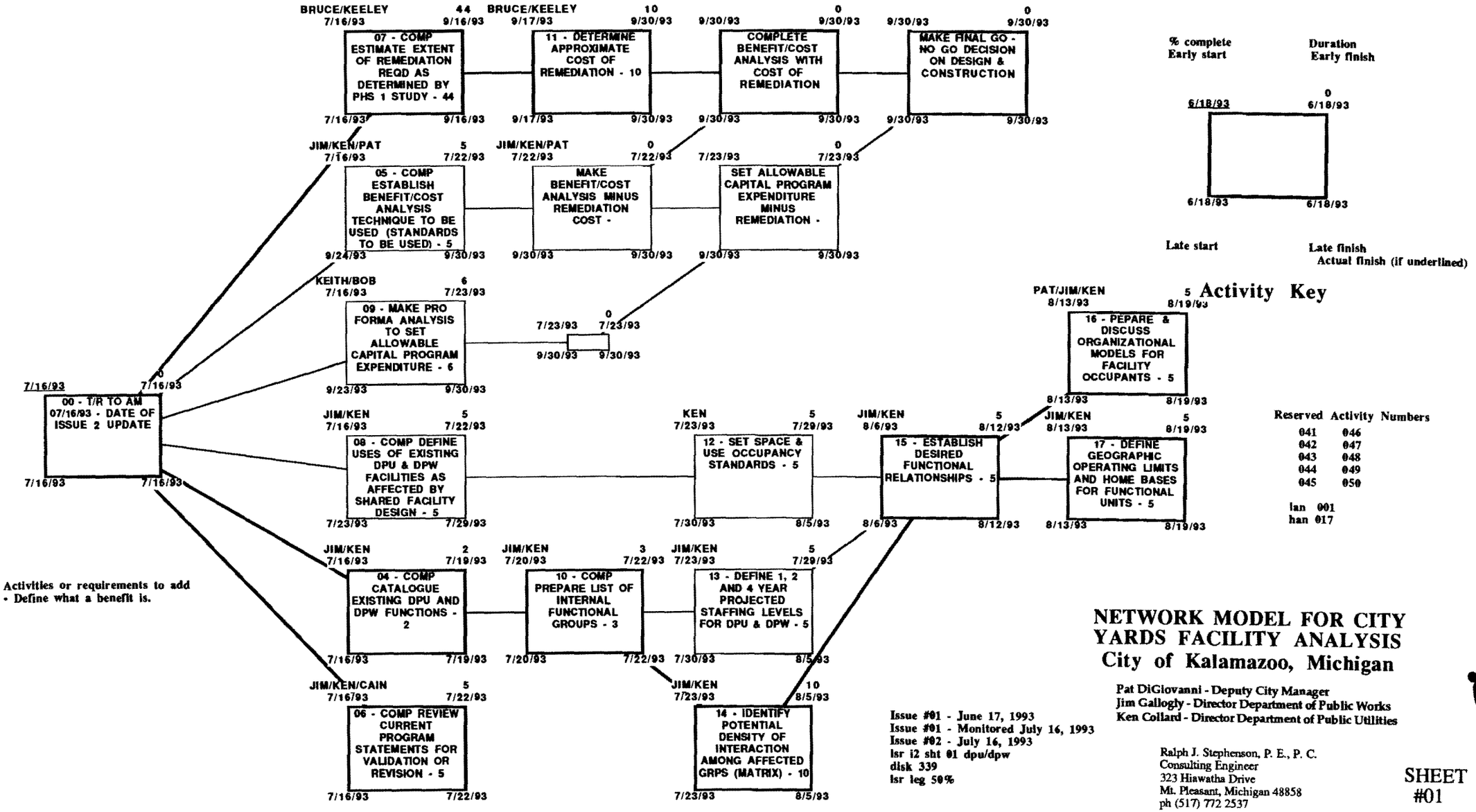
Issue #01 - June 17, 1993
Issue #01 - Monitored July 16, 1993
mtr 7/16/9311 sw sht 01 dpw/dpu
disk 339
sw leg 60%

NETWORK MODEL FOR CITY YARDS FACILITY ANALYSIS
City of Kalamazoo, Michigan

Pat DiGiovanni - Deputy City Manager
Jim Gallogly - Director Department of Public Works
Ken Collard - Director Department of Public Utilities

Ralph J. Stephenson, P. E., P. C.
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph (517) 772 2537

SHEET #01



NETWORK MODEL FOR CITY YARDS FACILITY ANALYSIS
City of Kalamazoo, Michigan

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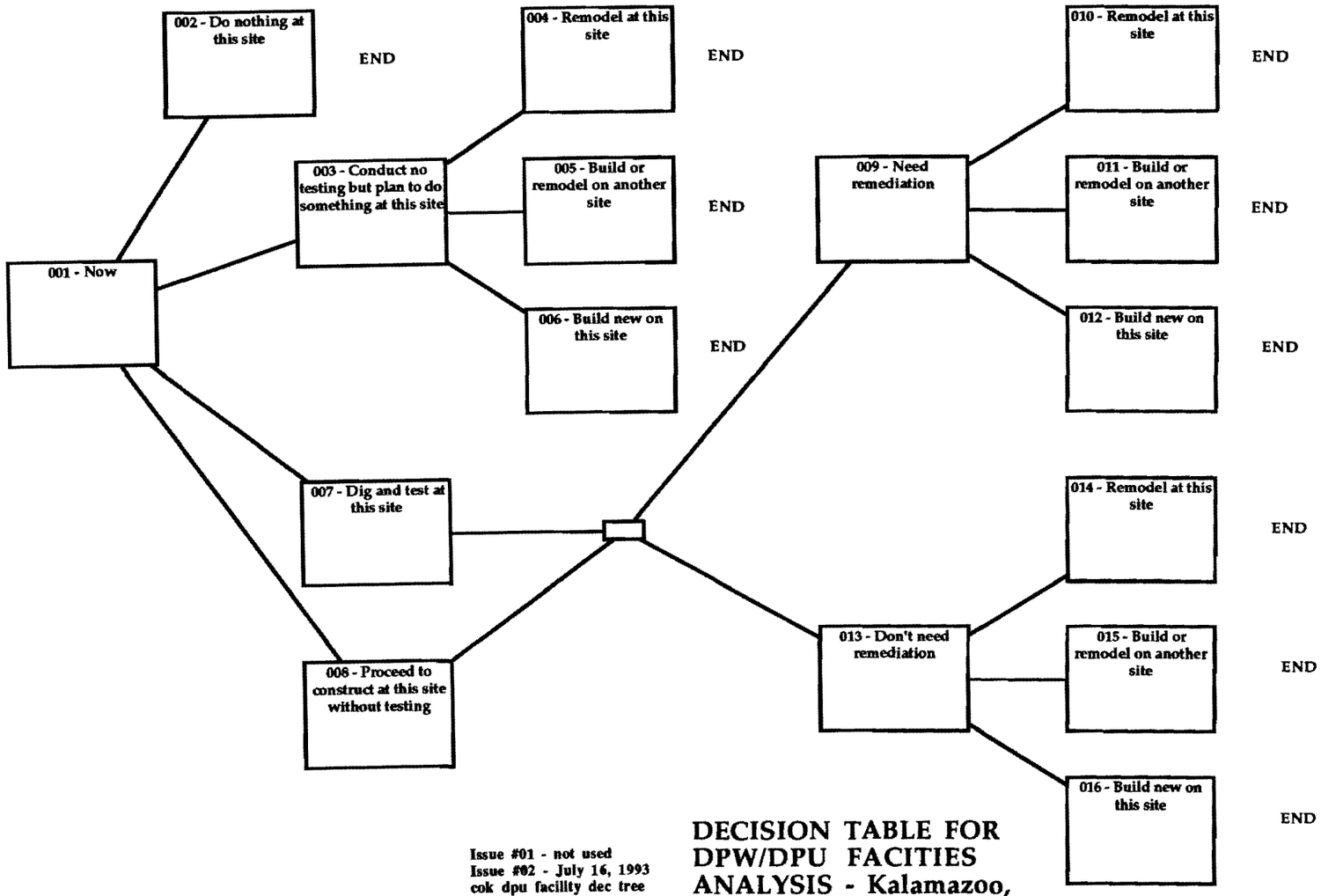
Ralph J. Stephenson, P. E., P. C.
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph (517) 772 2537

SHEET #01

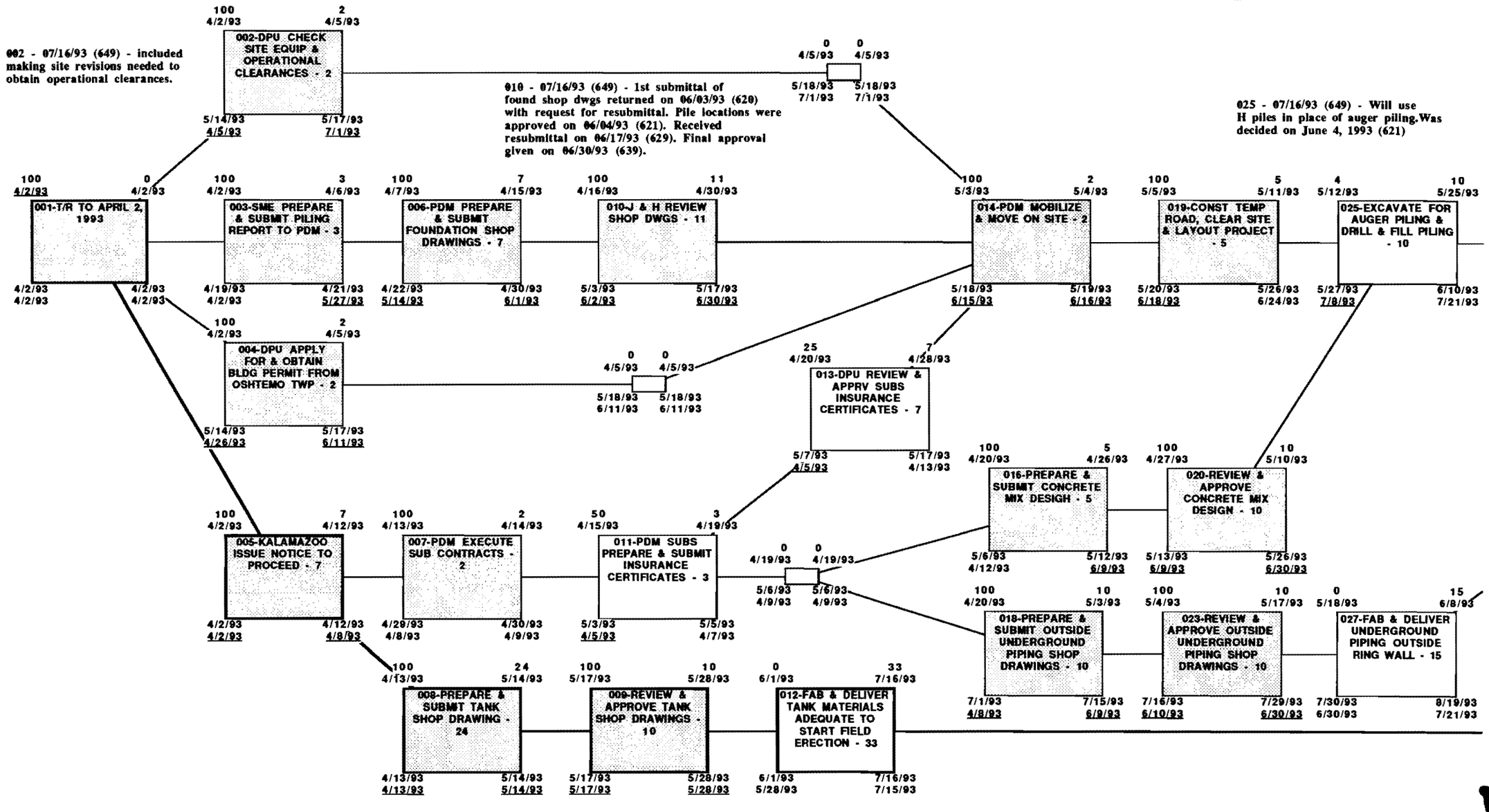
B

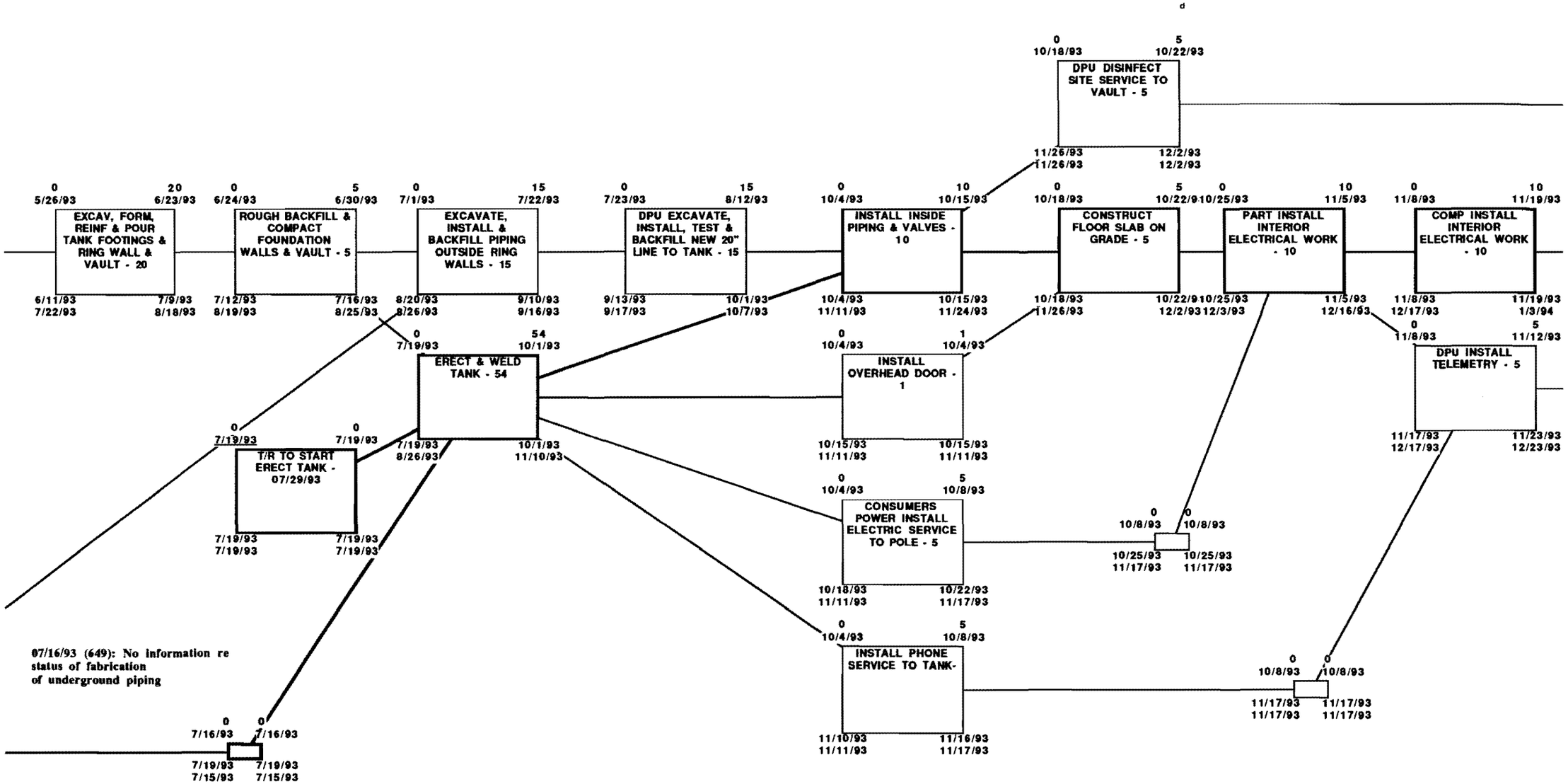


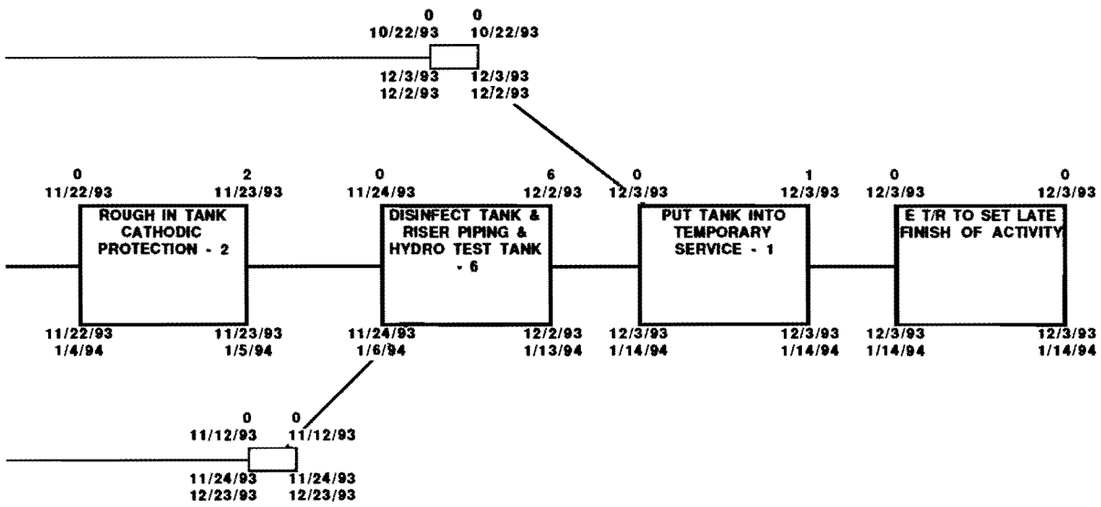
Issue #01 - not used
Issue #02 - July 16, 1993
cok dpu facillty dec tree
sw leg 60%

DECISION TABLE FOR DPW/DPU FACITIES ANALYSIS - Kalamazoo, Michigan

SHEET
#01


002 - 07/16/93 (649) - included making site revisions needed to obtain operational clearances.
010 - 07/16/93 (649) - 1st submittal of found shop dwgs returned on 06/03/93 (620) with request for resubmittal. Pile locations were approved on 06/04/93 (621). Received resubmittal on 06/17/93 (629). Final approval given on 06/30/93 (639).
025 - 07/16/93 (649) - Will use H piles in place of auger piling.Was decided on June 4, 1993 (621)
001-T/R TO APRIL 2, 1993
002-DPU CHECK SITE EQUIP & OPERATIONAL CLEARANCES - 2
003-SME PREPARE & SUBMIT PILING REPORT TO PDM - 3
004-DPU APPLY FOR & OBTAIN BLDG PERMIT FROM OSHTEMO TWP - 2
005-KALAMAZOO ISSUE NOTICE TO PROCEED - 7
006-PDM PREPARE & SUBMIT FOUNDATION SHOP DRAWINGS - 7
007-PDM EXECUTE SUB CONTRACTS - 2
008-PREPARE & SUBMIT TANK SHOP DRAWING - 24
009-REVIEW & APPROVE TANK SHOP DRAWINGS - 10
010-J & H REVIEW SHOP DWGS - 11
011-PDM SUBS PREPARE & SUBMIT INSURANCE CERTIFICATES - 3
012-FAB & DELIVER TANK MATERIALS ADEQUATE TO START FIELD ERECTION - 33
013-DPU REVIEW & APPRV SUBS INSURANCE CERTIFICATES - 7
014-PDM MOBILIZE & MOVE ON SITE - 2
016-PREPARE & SUBMIT CONCRETE MIX DESIGH - 5
018-PREPARE & SUBMIT OUTSIDE UNDERGROUND PIPING SHOP DRAWINGS - 10
019-CONST TEMP ROAD, CLEAR SITE & LAYOUT PROJECT - 5
020-REVIEW & APPROVE CONCRETE MIX DESIGN - 10
023-REVIEW & APPROVE OUTSIDE UNDERGROUND PIPING SHOP DRAWINGS - 10
025-EXCAVATE FOR AUGER PILING & DRILL & FILL PILING - 10
027-FAB & DELIVER UNDERGROUND PIPING OUTSIDE RING WALL - 15


0
10/18/93
5
10/22/93
DPU DISINFECT SITE SERVICE TO VAULT - 5
11/26/93
11/26/93
12/2/93
12/2/93
0
5/26/93
20
6/23/93
EXCAV, FORM, REINF & POUR TANK FOOTINGS & RING WALL & VAULT - 20
6/11/93
7/22/93
7/9/93
8/18/93
0
6/24/93
5
6/30/93
ROUGH BACKFILL & COMPACT FOUNDATION WALLS & VAULT - 5
7/12/93
8/19/93
7/16/93
8/25/93
0
7/1/93
15
7/22/93
EXCAVATE, INSTALL & BACKFILL PIPING OUTSIDE RING WALLS - 15
8/20/93
8/26/93
9/10/93
9/16/93
0
7/23/93
15
8/12/93
DPU EXCAVATE, INSTALL, TEST & BACKFILL NEW 20" LINE TO TANK - 15
9/13/93
9/17/93
10/1/93
10/7/93
0
10/4/93
10
10/15/93
INSTALL INSIDE PIPING & VALVES - 10
10/4/93
11/11/93
10/15/93
11/24/93
0
10/18/93
5
10/22/93
CONSTRUCT FLOOR SLAB ON GRADE - 5
10/18/93
11/26/93
10/22/93
12/2/93
0
10/25/93
10
11/5/93
PART INSTALL INTERIOR ELECTRICAL WORK - 10
10/25/93
12/3/93
11/5/93
12/16/93
0
11/8/93
10
11/19/93
COMP INSTALL INTERIOR ELECTRICAL WORK - 10
11/8/93
12/17/93
11/19/93
1/3/94
0
7/19/93
54
10/1/93
ERECT & WELD TANK - 54
7/19/93
8/26/93
10/1/93
11/10/93
0
10/4/93
1
10/4/93
INSTALL OVERHEAD DOOR - 1
10/15/93
11/11/93
10/15/93
11/11/93
0
11/8/93
5
11/12/93
DPU INSTALL TELEMETRY - 5
11/17/93
12/17/93
11/23/93
12/23/93
0
7/19/93
0
7/19/93
T/R TO START ERECT TANK - 07/29/93
7/19/93
7/19/93
7/19/93
7/19/93
0
10/4/93
5
10/8/93
CONSUMERS POWER INSTALL ELECTRIC SERVICE TO POLE - 5
10/18/93
11/11/93
10/22/93
11/17/93
0
10/8/93
0
10/8/93
10/25/93
11/17/93
10/25/93
11/17/93
0
10/4/93
5
10/8/93
INSTALL PHONE SERVICE TO TANK-
11/10/93
11/11/93
11/16/93
11/17/93
0
10/8/93
0
10/8/93
11/17/93
11/17/93
11/17/93
11/17/93
07/16/93 (649): No information re status of fabrication of underground piping
0
7/16/93
0
7/16/93
7/19/93
7/15/93
7/19/93
7/15/93

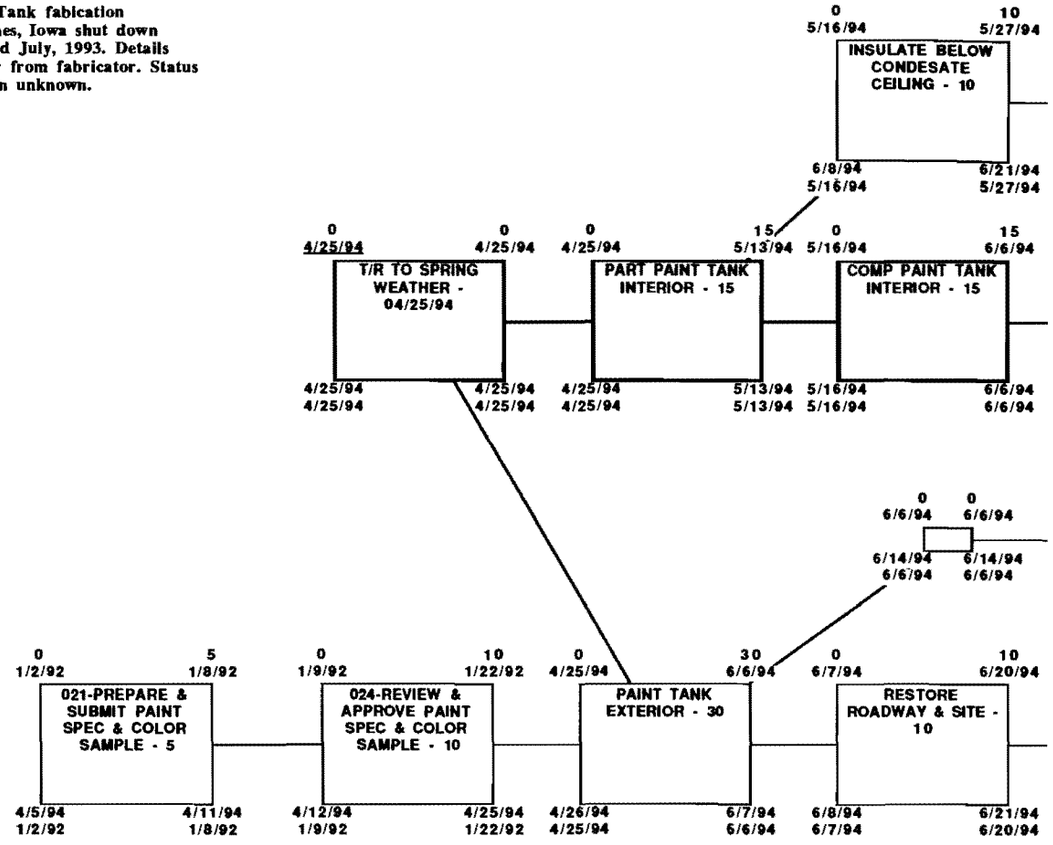

0
10/22/93
0
10/22/93
12/3/93
12/2/93
12/3/93
12/2/93
0
11/22/93
2
11/23/93
ROUGH IN TANK CATHODIC PROTECTION - 2
11/22/93
1/4/94
11/23/93
1/5/94
0
11/24/93
6
12/2/93
DISINFECT TANK & RISER PIPING & HYDRO TEST TANK - 6
11/24/93
1/6/94
12/2/93
1/13/94
0
12/3/93
1
12/3/93
PUT TANK INTO TEMPORARY SERVICE - 1
12/3/93
1/14/94
12/3/93
1/14/94
0
12/3/93
0
12/3/93
E T/R TO SET LATE FINISH OF ACTIVITY
12/3/93
1/14/94
12/3/93
1/14/94
0
11/12/93
0
11/12/93
11/24/93
12/23/93
11/24/93
12/23/93

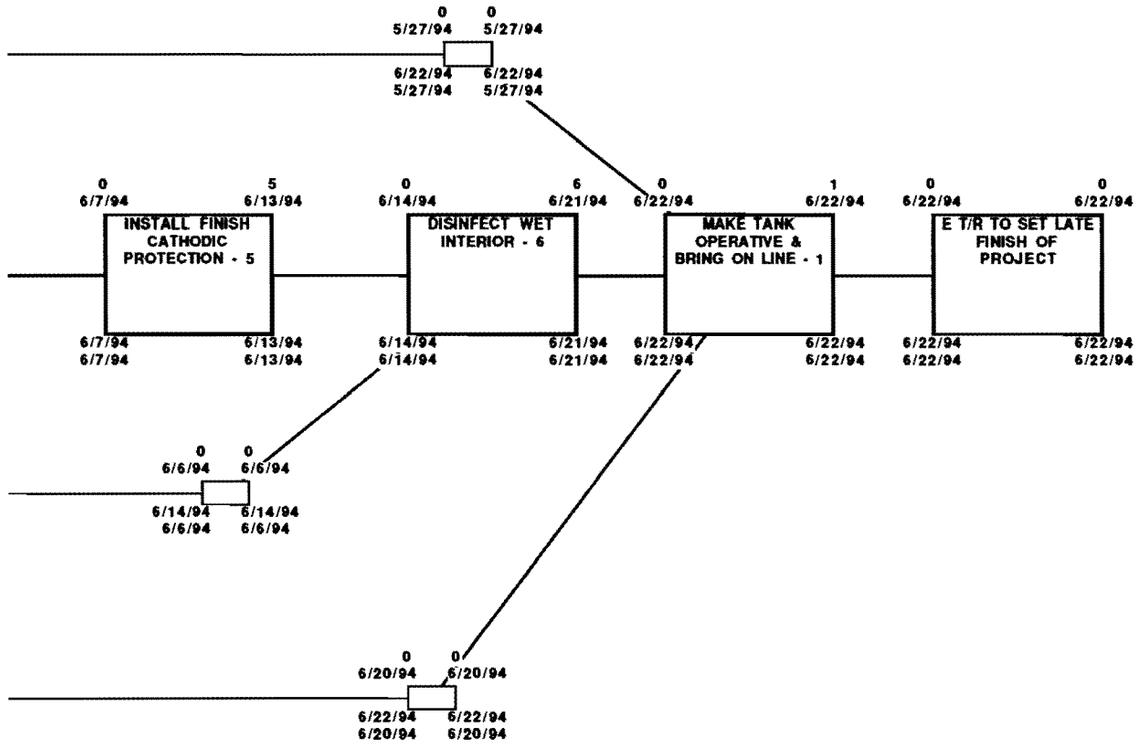
NOTE:

Procurement items to be added to network model.

07/16/93 (648) - Tank fabication plant in Des Moines, Iowa shut down by flooding in mid July, 1993. Details to follow in letter from fabricator. Status prior to shut down unknown.

1994 Work




0
5/27/94
0
5/27/94
6/22/94
5/27/94
6/22/94
5/27/94
0
6/7/94
5
6/13/94
INSTALL FINISH CATHODIC PROTECTION - 5
6/7/94
6/7/94
6/13/94
6/13/94
0
6/14/94
6
6/21/94
DISINFECT WET INTERIOR - 6
6/14/94
6/14/94
6/21/94
6/21/94
0
6/22/94
1
6/22/94
MAKE TANK OPERATIVE & BRING ON LINE - 1
6/22/94
6/22/94
6/22/94
6/22/94
0
6/22/94
0
6/22/94
E T/R TO SET LATE FINISH OF PROJECT
6/22/94
6/22/94
6/22/94
6/22/94
0
6/6/94
0
6/6/94
6/14/94
6/6/94
6/14/94
6/6/94
0
6/20/94
0
6/20/94
6/22/94
6/20/94
6/22/94
6/20/94

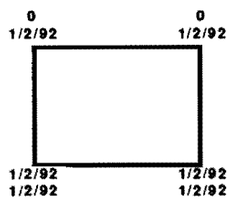
Reserved Activity Numbers

041	046
042	047
043	048
044	049
045	050

lan 001
han ?

% complete
Early start

Duration
Early finish



Late start
Actual start
(if underlined)

Late finish
Actual finish
(if underlined)

Activity Key

Project Status as of 07/16/93 (wd 649)

Issue #01 - April 2, 1993
Issue #01 - mtr 07/16/93
mtr 7/16/93 osh i1 lsr ntwk
disk 339

NETWORK MODEL FOR OSHTEMO WATER STORAGE TANK

City of Kalamazoo, Michigan
Department of Public Utilities

Frank Szopo, P. E. - Utilities Engineering Manager
Alberto Forero - Project Manager, DPU/DPW

Jones & Henry
Consulting Engineers
Tom Metcalf
Project Manager

Ralph J. Stephenson, P. E., P. C.
Consulting Engineer
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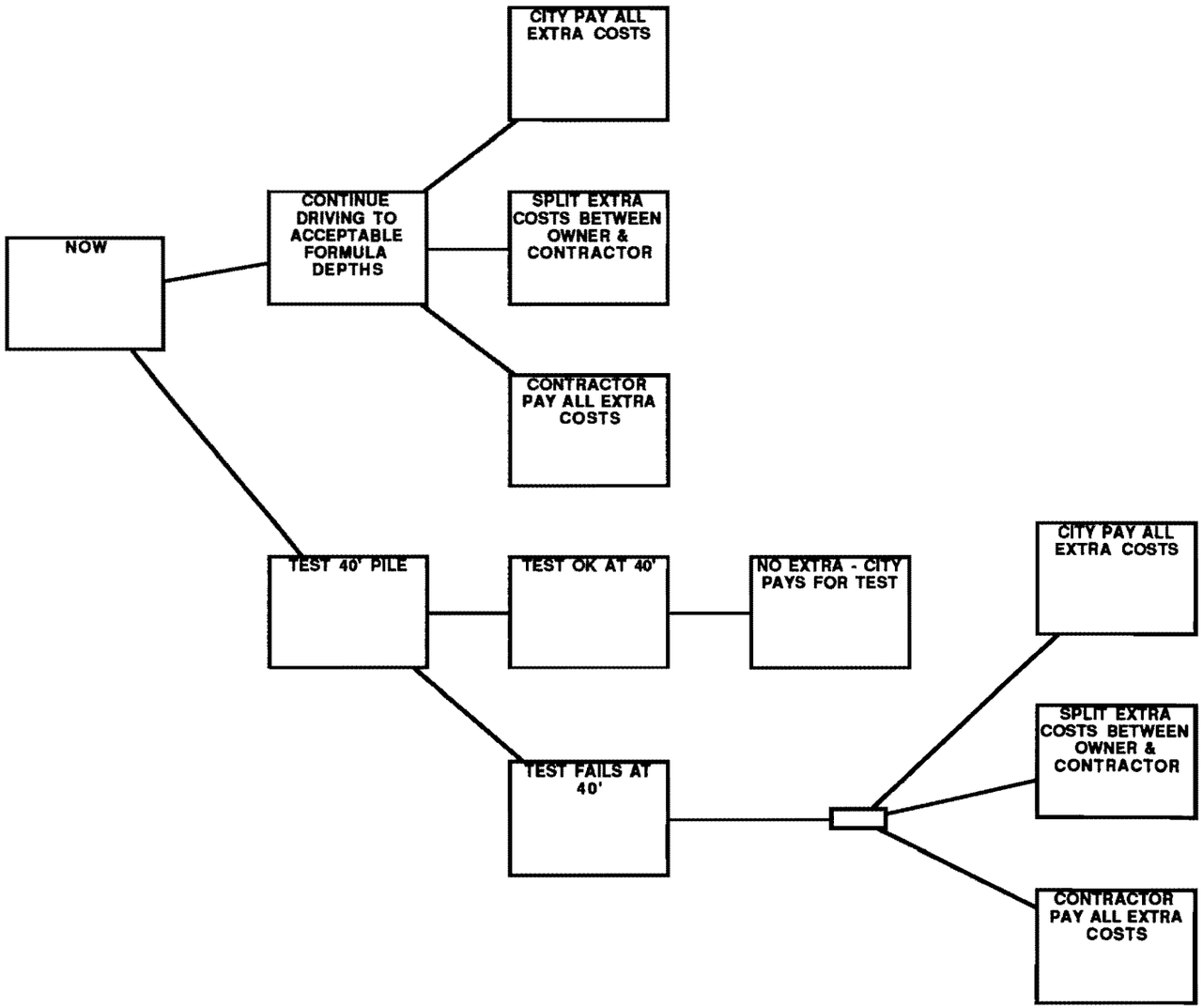
Mt. Pleasant, Michigan 48858
ph (517) 772 2537

SHEET
#01

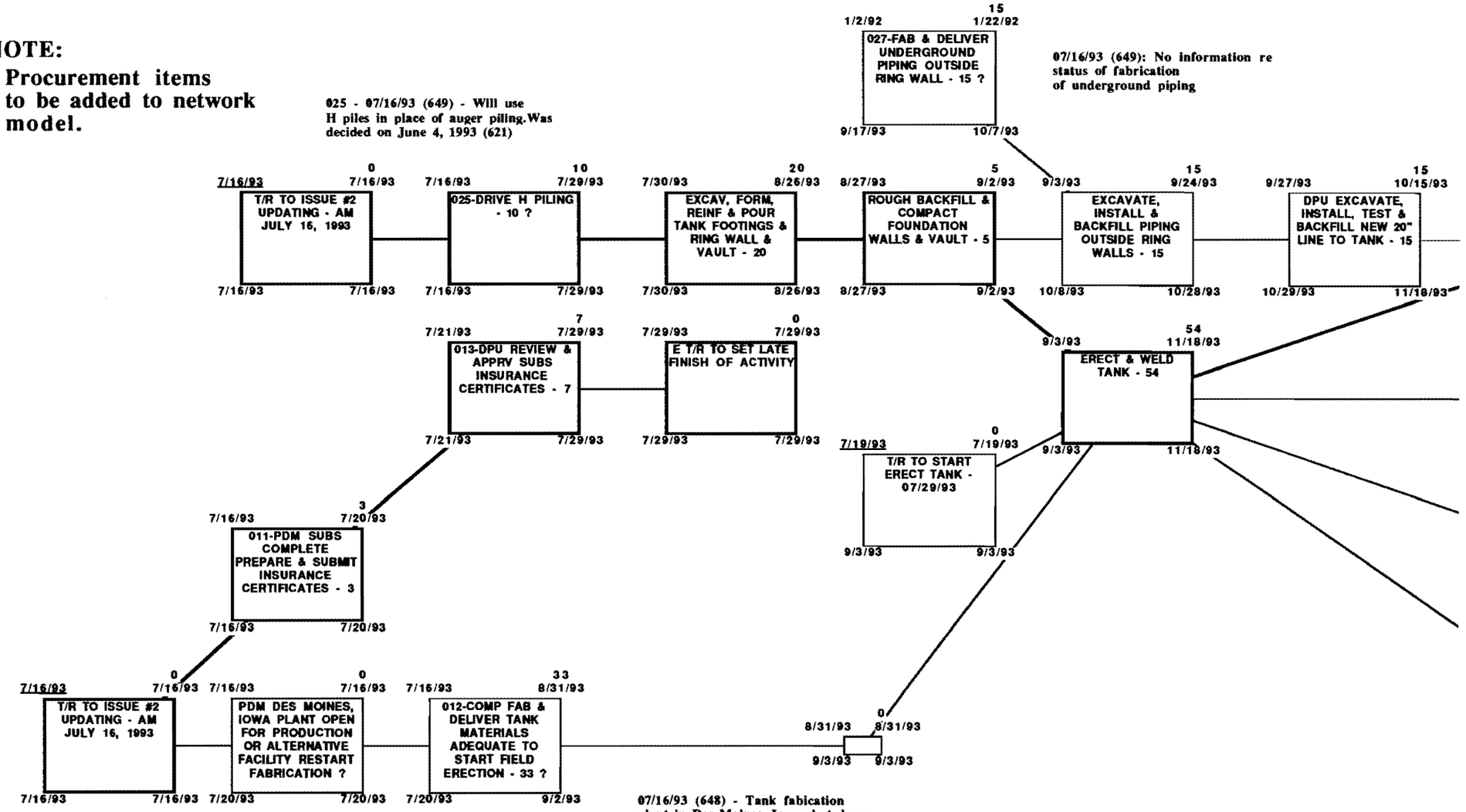


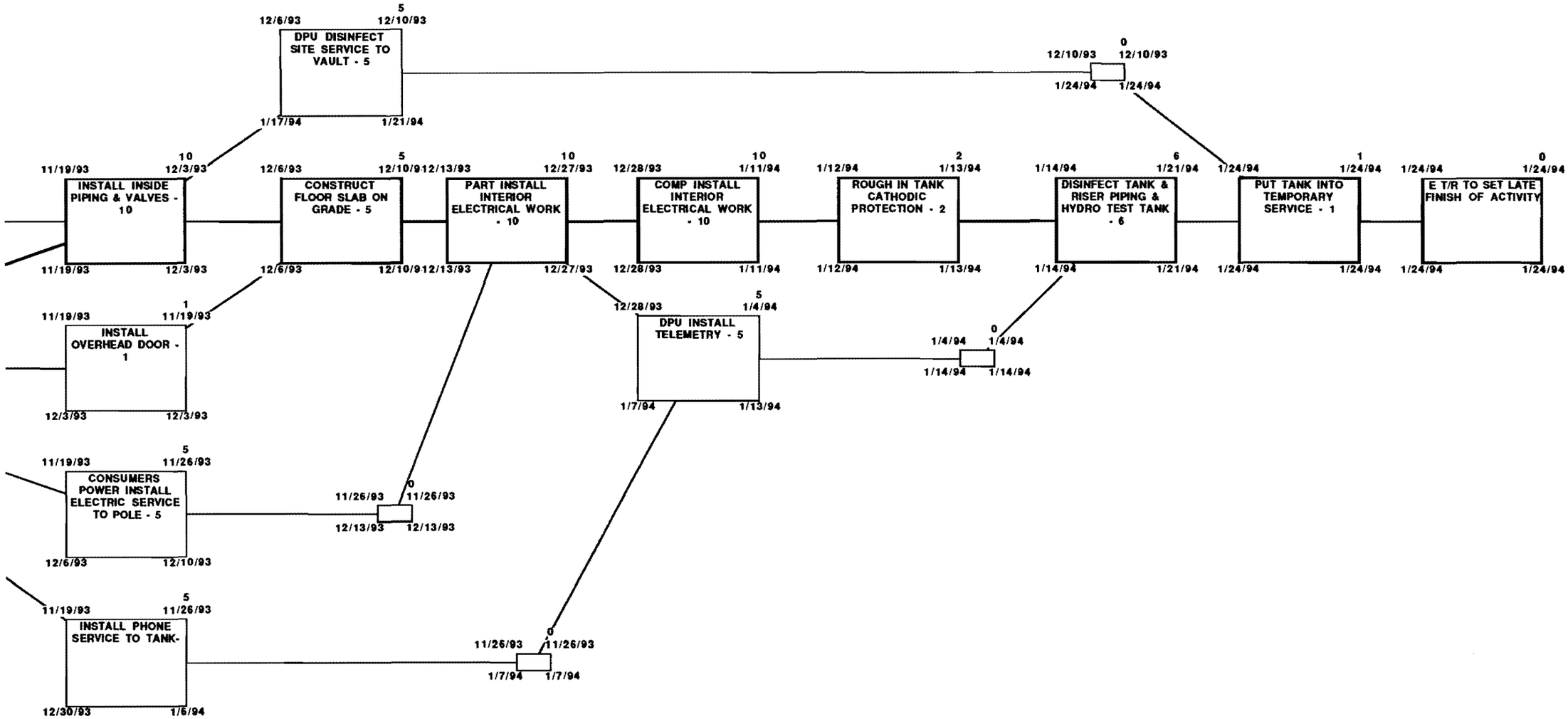
ISSUE #1 - JULY 16, 1993

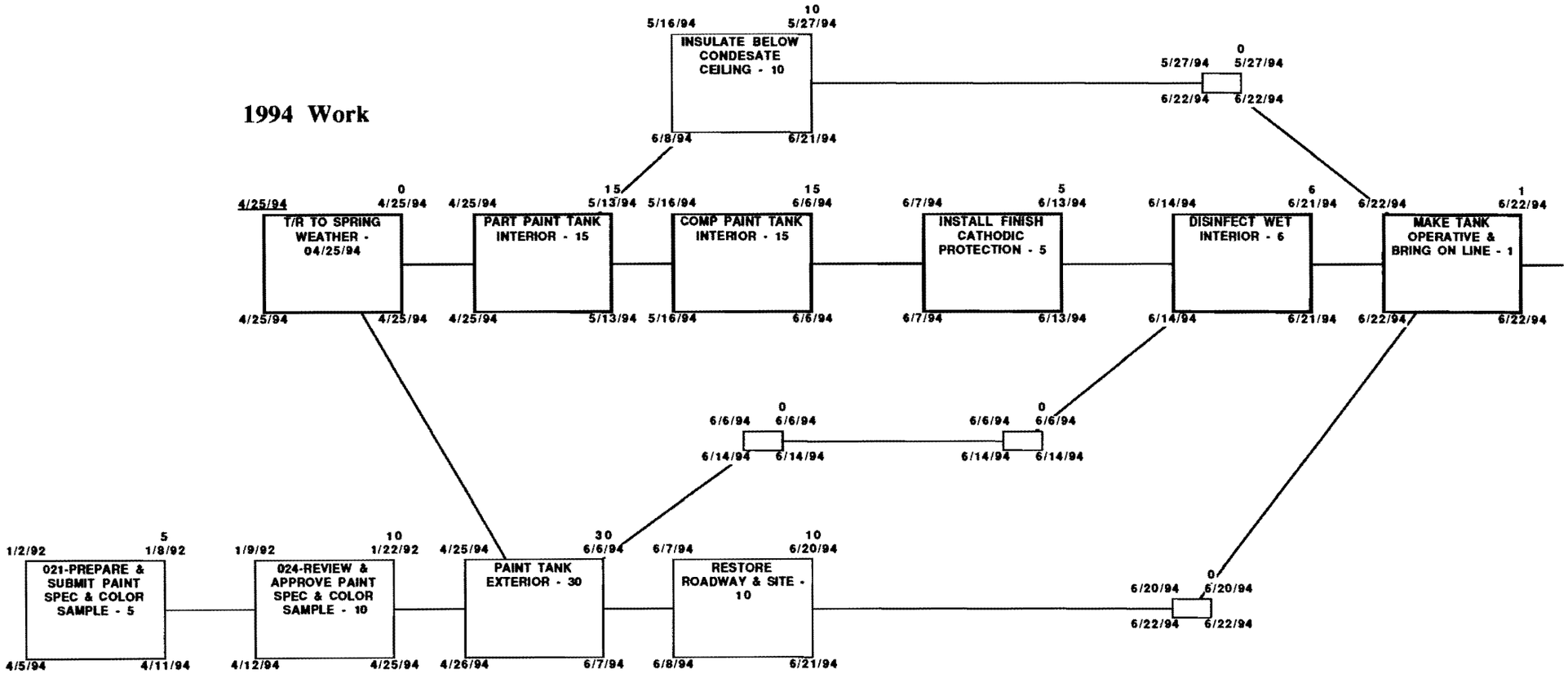
cok dpu decision tree

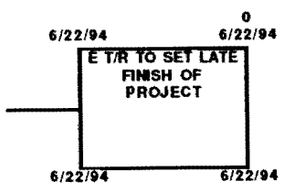
NOTE:

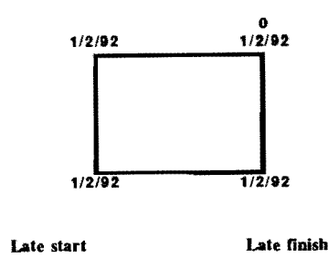
Procurement items to be added to network model.




DPU DISINFECT SITE SERVICE TO VAULT - 5
12/6/93
5
12/10/93
1/17/94
1/21/94
0
12/10/93
12/10/93
1/24/94
1/24/94
INSTALL INSIDE PIPING & VALVES - 10
11/19/93
10
12/3/93
11/19/93
12/3/93
CONSTRUCT FLOOR SLAB ON GRADE - 5
12/6/93
5
12/10/93
12/6/93
12/10/93
PART INSTALL INTERIOR ELECTRICAL WORK - 10
12/13/93
10
12/27/93
12/13/93
12/27/93
COMP INSTALL INTERIOR ELECTRICAL WORK - 10
12/28/93
10
1/11/94
12/28/93
1/11/94
ROUGH IN TANK CATHODIC PROTECTION - 2
1/12/94
2
1/13/94
1/12/94
1/13/94
DISINFECT TANK & RISER PIPING & HYDRO TEST TANK - 6
1/14/94
6
1/21/94
1/14/94
1/21/94
PUT TANK INTO TEMPORARY SERVICE - 1
1/24/94
1
1/24/94
1/24/94
1/24/94
E T/R TO SET LATE FINISH OF ACTIVITY
1/24/94
0
1/24/94
1/24/94
1/24/94
INSTALL OVERHEAD DOOR - 1
11/19/93
1
11/19/93
11/19/93
12/3/93
DPU INSTALL TELEMETRY - 5
12/28/93
5
1/4/94
1/7/94
1/13/94
1/4/94
0
1/4/94
1/14/94
1/14/94
CONSUMERS POWER INSTALL ELECTRIC SERVICE TO POLE - 5
11/19/93
5
11/26/93
12/6/93
12/10/93
11/26/93
0
11/26/93
12/13/93
12/13/93
INSTALL PHONE SERVICE TO TANK-
11/19/93
5
11/26/93
12/30/93
1/6/94
11/26/93
0
11/26/93
1/7/94
1/7/94


1994 Work
INSULATE BELOW CONDESATE CEILING - 10
5/16/94
10
5/27/94
6/8/94
6/21/94
5/27/94
0
5/27/94
6/22/94
6/22/94
4/25/94
T/R TO SPRING WEATHER - 04/25/94
4/25/94
0
4/25/94
4/25/94
4/25/94
PART PAINT TANK INTERIOR - 15
15
5/13/94
5/16/94
COMP PAINT TANK INTERIOR - 15
15
6/6/94
6/7/94
INSTALL FINISH CATHODIC PROTECTION - 5
5
6/13/94
6/14/94
DISINFECT WET INTERIOR - 6
6
6/21/94
6/22/94
MAKE TANK OPERATIVE & BRING ON LINE - 1
1
6/22/94
6/6/94
0
6/6/94
6/14/94
6/14/94
6/6/94
0
6/6/94
6/14/94
6/14/94
1/2/92
021-PREPARE & SUBMIT PAINT SPEC & COLOR SAMPLE - 5
5
1/8/92
4/5/94
4/11/94
1/9/92
024-REVIEW & APPROVE PAINT SPEC & COLOR SAMPLE - 10
10
1/22/92
4/12/94
4/25/94
4/25/94
PAINT TANK EXTERIOR - 30
30
6/6/94
4/26/94
6/7/94
6/7/94
RESTORE ROADWAY & SITE - 10
10
6/20/94
6/8/94
6/21/94
6/20/94
0
6/20/94
6/22/94
6/22/94





Activity Key

Reserved Activity Numbers

041	046
042	047
043	048
044	049
045	050

lan 001
han ?

Project Status as of 07/16/93 (wd 649)

NETWORK MODEL FOR OSHTEMO WATER STORAGE TANK
City of Kalamazoo, Michigan
Department of Public Utilities

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