

Monitoring #1

Ralph J. Stephenson PE PC Consulting Engineer
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phone 518 772 2537

March 23, 1991

Project: Michigan State University
Horticultural Demonstration Gardens
North Garden
East Lansing, Michigan

To: Dennis Hansen MM Owner's representative - MSU
Jerry Carter Project manager - MTCC

From: Ralph J. Stephenson Consultant

RJS project: 91:08

Date of monitoring: March 19, 1991 (wd 055)

Key dates:

- October 15, 1991 pm (wd 203) - Completion date for all cast in place concrete
- November 30, 1991 pm (wd 235) - Final project completion date

Those attending:

- Jerry Carter - Project manager - Moore Trosper Construction Co.
- Dennis Hansen MM - Owner's representative - MSU - in meeting part time
- Doug Badgero - Supervisor horticultural greenhouse & gardens - MSU - in meeting part time

Actions taken:

- Reviewed project with Mr. Jerry Carter MTCC project manager
- Set boundaries of area #1 on project
- Prepared laundry list of actions to be taken to construct area #1
- Prepared preliminary network model - issue #1 dated March 19, 1991 (wd 055) for area #1
- Reviewed portion of area #1 network model with Mr. Doug Badgero
- Reviewed network model for area #1 with Mr. Dennis Hansen

Monitored from:

- Sheet #1, issue #1 dated 03/19/91 (wd 055)

General summary:

This was the first MSU Horticultural North Garden construction project planning meeting. Mr. Jerry Carter of Moore Trosper Construction Co. and I made a general review of the entire job and then concentrated on planning portions of the early field and procurement work.

Mr. Badgero visited us as we were doing our planning work and we reviewed the network briefly with him. Near the end of our session Mr. Hansen joined our meeting and we were able to discuss the intended sequencing with him in detail. Copies of the network model Sheet #1, issue #1 for area #1 were provided to both Mr. Carter and Mr. Hansen at the close of the planning session.

Mr. Carter suggested we break the project into specific areas containing identifiable elements of the project. Area #1 was identified as containing the North Entry Arch (nea), the Feature

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Wall and Plaza (fwp), the Reflecting Pool (rfp) and the Screen Wall (scw). Other area divisions of the project were not designated, but Mr. Carter said he will probably break the entire site into four areas. These will be identified in our next planning session.

The construction actions needed to construct Area #1 were listed at random in a laundry list, rearranged in a rough installation order according to the specification sequence, and then converted to a preliminary network model shown on Sheet #1, issue #1 dated 03/19/91 (wd 055). An unassembled copy of the network is enclosed with this report.

The durations used in the network planning are in working days. The working day calendar used removes all Saturdays, Sundays and six holidays as working days in each year. Any special application of working days is accommodated as required by job conditions as the project proceeds.

It is assumed currently that the project notice to proceed or its equivalent will be issued by the University on the AM of 04/05/91 (wd 068). Pre construction meetings and submittal of insurance certificates and bonding documentation were assumed to require five working days from then. Mobilization and move on site is estimated to take five working days. This brings start of field work at Area #1 to the morning of April 22, 1991 (wd 079) - activity #008 in the network plan.

Procurement activities will be initiated by Mr. Carter as soon as the notice to proceed is provided. In the initial plan for area #1 the only procurement item shown is for precast concrete elements - activities #005, 007, 009 and 012. As planning proceeds we will add other major procurement items area by area as required.

Of importance in timely procurement is the approval by all concerned of the submittal turn around times. This is particularly critical on the Horticultural Garden project due to the short construction period. For preliminary purposes we have assumed a turn around of 24 working days allocated as follows:

- | | |
|-----------------------------------------------|----------------|
| • MTCC receive, log in and check submittal | 5 working days |
| • MTCC transmit submittal to JJR | 3 working days |
| • JJR review and approve submittals | 10 working day |
| • JJR transmit submittals to MTCC | 3 working days |
| • MTCC receive and review approved submittals | 3 working days |
| • MTCC transmit submittals to sub contractor | 3 working days |

Total

24 working days
27

This is an initial suggested turn around assumption and should be reviewed and agreed on by all involved parties before the project procurement begins.

Preliminary sequencing within Area #1 for excavation work and construction of footings is to begin at the north entry area, move to the feature wall and plaza area, then move to the screen wall area, and then to the reflecting pool area. This sequence will be reviewed carefully by Mr. Carter along with his desired sequences for the other areas. At our next session we will plan to complete work up to grade for all areas.

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March 23, 1991

Concurrently we will be planning installation of above grade features at each area along with the procurement of all items, but particularly the long lead items for the total project.

Since many basic decisions will be made so far as move in, construction site planning, access, procurement submittal approval and other site and construction processes from the basic sequence it is essential to job success for all parties to the project to plan and accomplish their work in the same general area and action sequence. We shall firm up the necessary and desired area and action plans and linkages at our next planning and monitoring session. This next working meeting is to be held on Monday, April 1, 1991 (wd 064) at the MSU Plant Soil and Science Building.

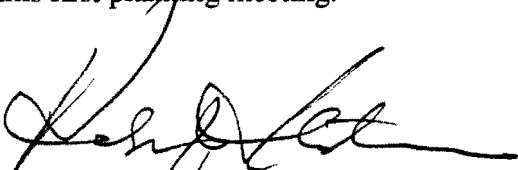
I shall be in touch with Mr. Hansen and Mr. Carter shortly to confirm the date and location. Meanwhile both have been given a preliminary copy of Sheet #1, issue #1 project plan and the early start/early finish bar chart for review and comment. These will form the basis from which the next meeting will start.

I have recommended to Mr. Hansen and Mr. Carter that they use the area designations and the action sequences specified to set the request for payment format. We are trying to plan the project so the information in the network model can be related to the request for payment line items. Mr. Carter and Mr. Hansen will establish the billing methodology to be used relative to the network model.

During the course of the project, I shall plan to monitor regularly each three to five weeks. These monitoring inspections will be cleared with both Mr. Hansen and Mr. Carter ahead of time. A monitoring report will be prepared by me describing the results of each monitoring and evaluating the current status of the project measured against the current plan of work.

Copies of this report are being sent to Mr Hansen and to Mr. Carter. Any further distribution should be by Mr. Hansen and Mr. Carter.

I want to thank Mr. Hansen, Mr. Badgero and Mr. Carter for their efforts and courtesy in helping obtain the meeting room and in moving well through this first planning meeting.



Ralph J. Stephenson PE

April 6, 1991

Subject: Monitoring Report #2

Project: Michigan State University
Horticultural Demonstration Gardens
North Garden
East Lansing, Michigan

To: Dennis Hansen MM - Owner's representative - MSU
Jerry Carter - Project manager - MTCC

From: Ralph J. Stephenson - Consultant

RJS project: 91:08

Date of monitoring: March 19, 1991 (wd 055)

Monitored from:

- Sheet #1, issue #1 dated 03/19/91 (wd 055)

Key dates:

- October 15, 1991 pm (wd 203) - Completion date for all cast in place concrete
- November 30, 1991 pm (wd 235) - Final project completion date

Those attending:

- Jerry Carter - Moore Trosper Construction Co.
- Dennis Hansen MM - MSU - in meeting part time
- Dr. Will Carlson - MSU - in meeting part time

Actions taken:

- Reviewed current status of project with Mr. Hansen and Mr. Carter
- Revised sheet #1, issue #1 of network model for area #1 in accordance with Mr. Hansen's letter to me of March 29, 1991 (wd 063)
- Prepared list of anticipated long lead procurement items
- Prepared preliminary network models for areas #2, 3 and 4
- Made very brief review of planning process with Dr. Will Carlson
- Printed and pasted up sheets #1 and 2 and gave to Jerry Carter for his preliminary review

April 6, 1991

General summary:

The major work effort at this session was concentrated on reviewing and revising the issue #1 network for Area #1 and preparing network models for Areas #2, 3 and 4. Copies of the networks produced during the session were given to Mr. Carter for his review and early use. I later edited the networks and have forwarded these to Mr. Hansen and Mr. Carter for their review and comments.

It is still the intent of MSU to issue a notice for Moore Trosper to proceed on April 8, 1991 (wd 069). Therefore we discussed the efforts to be made up front to get the project mobilized and underway as soon as Board approval is given. We also reviewed the comments of Mr. Hansen on the issue #1 network and made most of his suggested revisions.

One of the key elements of this meeting was further definition of the areas and the features contained in each. The areas as presently defined and shown in the network models are as follows:

Area #1

- North entry arch (nea)
- Feature wall and plaza (fwp)
- Screen wall (scw)
- Reflecting pool (rfp)

Area #2

- Gazebo (gaz)

Area #3

- Fountain (fou)
- Sunken gardens (sga)
- Sculpture pad (spa)
- Sundial plaza (spl)

Area #4

- West entrance trellis (wet)
- Conservatory plaza (cpl)

April 6, 1991

In the network models sent to Mr. Hansen and Mr. Carter areas #1 and 2 were shown on sheet #1 and areas #3 and 4 on sheet #2. Procurement items were show directly connecting into their related field actions. Procurement tasks were also given 500 series activity designations to distinguish them from field activities which are numbered from 001 to 158.

Procurement items show on the networks included the following:

- Precast concrete columns and arches
- Laminated wood beams
- Precast concrete vault for the fountain equipment
- Precast manholes (no shop drawings required?)
- Precast catch basins (no shop drawings required?)
- Reinforcing steel
- Limestone caps and copings
- Granite
- Fountain equipment
- Light poles
- Templates and anchor bolts for light poles
- Anchor bolts for precast columns
- Precast caps and copings
- Concrete design mixes
- Brick pavers
- Concrete pavers
- Granite pavers
- Fact brick at screen wall
- Precast concrete steps at fountain

Those approval items of importance that are not yet included in the network models include the following:

- Light fixtures
- Manhole and catch basin covers
- Precast concrete seat wall
- Dampproofing and sealants
- Laminated beam brackets

These will be shown as required on subsequent issues of the network

April 6, 1991

model.

An item of importance is that the contract completion date required for all cast in place concrete work is the pm of October 15, 1991 (wd 203). However with the present plan of work and activity durations, cast in place concrete is shown being completed by the pm of October 21, 1991 (wd 205). This should be a relatively easy matter to adjust and we shall address the slight time reduction needed at our next planning and monitoring meeting.

Monitoring reports will be sent to Mr. Hansen and Mr. Carter directly. Further distribution will be by them as desired.

I shall contact Mr. Hansen and Mr. Carter shortly to set up our next planning and monitoring session.

A handwritten signature in black ink, appearing to read 'R. Stephenson', with a long horizontal flourish extending to the right.

Ralph J. Stephenson PE

Ralph J. Stephenson PE PC
Consulting Engineer

April 28, 1991

Subject: Monitoring Report #3

Project: Michigan State University
Horticultural Demonstration Gardens
North Garden
East Lansing, Michigan

To: Dennis Hansen MM - Owner's representative - MSU
Jerry Carter - Project manager - MTCC

From: Ralph J. Stephenson - Consultant

RJS project: 91:08

Date of monitoring: April 22, 1991 (wd 079)

Monitored from:

- Sheets 1 and 2 , issue #2 dated 04/01/91 (wd 064)

Key dates:

- October 15, 1991 pm (wd 203) - Completion date for all cast in place concrete
- November 30, 1991 pm (wd 235) - Final project completion date

Those attending:

- Mr. Dennis Hansen MM - MSU - in meeting part time
- Mr. Jerry Carter, project manager - Moore Trospen Construction Co.
- Mr. Keith Griswold, superintendent - Moore Trospen Construction Co.
- Ralph J. Stephenson - consultant

Actions taken:

- Inspected project
- Reviewed current status of project with Mr. Griswold
- Revised sheets #1 and 2, issue #2 of network model in conjunction with Mr. Carter and Mr. Griswold
- Printed sheets #1 and 2, issue #3, dated April 22, 1991 (wd 079) and gave to Mr. Carter and Mr. Griswold for their further review and comment

General summary:

The contractor's trailer has been moved on site and general project work is underway. The area is barricaded to the public and site stripping and demolition is in progress. The notice to proceed was issued on April 5, 1991 (wd 068) and Moore Trospen moved on the site April 12, 1991 (wd 073).

Field work has gotten off to a good start and the project management staff for the owner and the contractor appear to have a very good understanding of the project needs.

Ralph J. Stephenson PE PC
Consulting Engineer

April 28, 1991

Currently careful attention is being given to awarding sub contracts and expediting submittals for critical materials and equipment. Shop drawings for precast catch basins, early reinforcing steel and architectural precast items are complete or in work. Concrete design mixes have been submitted to MSU for approval.

Mr. Carter, Mr. Griswold and I spent a major portion of our meeting time updating the issue #2 network, dated April 1, 1991 (wd 064). Mr. Griswold had carefully reviewed the earlier plans of work and made several revisions. These resulted in preparation of the issue #3 network, dated April 22, 1991 (wd 079), which was printed and given to Mr. Carter and Mr. Griswold for their review and comments. I have subsequently made further minor corrections, slightly rearranged the plan and have issued it to Mr. Hansen and Mr. Carter as sheets #1 & 2, issues 4 & 4x respectively, dated April 27, 1991 (wd 084).

I have also asked Mr. Hansen and Mr. Carter, in conjunction with Mr. Griswold to review the current issue of the network & make the appropriate additions and revisions. We will then address these in our next planning and monitoring session. The work plans for areas #3 and 4 shown on sheet #2 should be reviewed carefully, since in my opinion there still appear to be some corrections and additions that should be made to the logic and to the scope of work. It is to be emphasized that the ultimate plan of work should be one that is acceptable to the contractor and is to be performed within the contract document conditions.

The overall current plan of work appears to be achievable within the contract time frame, provided procurement of materials and equipment is expedited. Deliveries to the job site will to a large extent set the entire project work pattern. Major procurement items include:

- ✓• Precast concrete columns and arches
- ✓• Laminated wood beams
- ✓• Precast concrete vault for the fountain equipment
- ✓• Precast manholes
- ✓• Precast catch basins
- ✓• Reinforcing steel
- ✓• Limestone caps and copings
- ✓• Granite
- ✓• Fountain equipment
- ✓• Light poles
- ✓• Templates and anchor bolts for light poles
- ✓• Anchor bolts for precast columns
- ✓• Precast caps and copings
- ✓• Concrete design mixes
- ✓• Brick pavers
- ✓• Concrete pavers
- ✓• Granite pavers
- ✓• Face brick at screen wall
- ✓• Precast concrete steps at fountain
- ✓• Light fixtures
- ✓• Manhole and catch basin covers
- ✓• Precast concrete seat wall

Ralph J. Stephenson PE PC

Consulting Engineer

April 28, 1991

- Dampproofing and sealants
- Laminated beam brackets

This monitoring report is being sent to Mr. Hansen and Mr. Carter directly. Further distribution will be by them as desired. I shall be in touch with Mr. Hansen and Mr. Carter shortly to set our next planning and monitoring session.

A handwritten signature in black ink, appearing to read 'Ralph J. Stephenson', with a long horizontal line extending to the right.

Ralph J. Stephenson PE

Ralph J. Stephenson PE PC
Consulting Engineer

May 21, 1991

Subject: Monitoring Report #4

Project: Michigan State University
Horticultural Demonstration Gardens
North Garden
East Lansing, Michigan

To: Dennis Hansen - Owner's representative - MSU
Jerry Carter - Project manager - MTC

From: Ralph J. Stephenson - Consultant

RJS project: 91:08

Date of monitoring: May 16, 1991 (wd 097)

Monitored from:

- Sheet 1, issue #4x dated 04/27/91 (wd 084)
- Sheet 2, issue #4 dated 04/27/91 (wd 084)

Key dates:

- October 15, 1991 pm (wd 203) - Completion date for all cast in place concrete
- November 30, 1991 pm (wd 235) - Final project completion date (138 working days remaining to contract completion date)

Those attending:

- Mr. Jerry Carter - MTC project manager - in meeting part time
- Mr. Keith Griswold - MTC superintendent - in meeting part time
- Ralph J. Stephenson - consultant

Actions taken:

- Inspected project
- Reviewed current status of project with Mr. Griswold
- Updated sheets #1 & 2 to issue #5, dated May 16, 1991 (wd 097) with Mr. Carter and Mr. Griswold
- Printed sheet #1, issue #5, dated May 16, 1991 (wd 097) and gave to Mr. Griswold for his interim use.

General summary:

Work is continuing on stripping the site, installing underground utilities and

Ralph J. Stephenson PE PC
Consulting Engineer

May 21, 1991

constructing foundations for structures. As of May 16, 1991 (wd 097) footing for the gazebo, feature wall, north entry arch structure and the screen wall have been installed and work on concrete piers and walls is in progress.

According to Mr. Griswold, the site utility contractor began laying sewer pipe on May 13, 1991 (wd 094). This work is moving fairly well although there have been some delays in the delivery of precast catch basins.

Mr. Griswold said the electrical contractor began removing and relocating electrical work on April 30, 1991 (wd 085). This operation will be ongoing as space becomes available.

On May 2, 1991 (087) poorer than expected soil conditions were apparently encountered on the site and this slowed work on several operations. It also necessitated use of lean concrete fill under some of the footings for structures. However the soil difficulties were resolved through prompt field action by the owner and contractors, and work is now proceeding fairly well.

Most current work is concentrated in what is called Area #1. This section of the project includes the north entry arch, the feature wall, the reflecting pool area and the screen wall. Activities there presently lag desired early start, early finish target dates as shown in the Issue 4 and 4x networks, dated April 27, 1991 (wd 072) by 10 to 12 working days. The lag is in both footing construction and in underground sewer installation.

Procurement of materials and equipment still is of major concern. On a time and weather sensitive project such as the North Garden, timely delivery of materials is extremely critical. Field installation must be able to proceed as sequencing, and particularly weather permits. These conditions demand that materials and equipment be available when needed. I was able to review some of the procurement items with Mr. Griswold and Mr. Carter. A brief summary of procurement status to the extent of current information available at our monitoring of May 16, 1991 (wd 097) is summarized below.

- Sewer pipe - available as needed.
- Precast manholes - available as needed.
- Concrete design mixes - approved.
- Reinforcing steel - available as needed.
- Anchor bolts for structures and light poles - available as needed.
- Precast concrete columns & arches - shop drawing in for approval. Early deliveries expected by about June 27, 1991.

Ralph J. Stephenson PE PC
Consulting Engineer

May 21, 1991

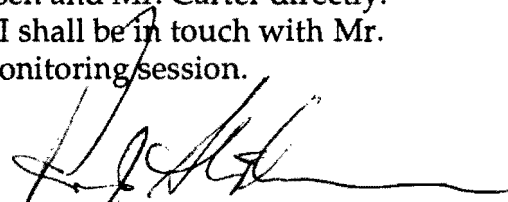
- Laminated wood beams - available as needed.
- Precast concrete vault for fountain equipment - to be on site by June 3, 1991 (wd 108).
- Limestone caps and copings - no current information on shop drawings.
- Granite - no current information on shop drawings.
- Fountain equipment - no current information on delivery.
- Light poles - historic light poles to be furnished by MSU in early September, 1991. Should check on other light pole requirements.
- Precast caps and copings - no current information on this item.
- Brick pavers - available as needed after June 3, 1991 (wd 108).
- Concrete pavers - no current information on this item.
- Granite pavers - no current information on this item.
- Face brick at screen wall - available as of May 21, 1991 (wd 100).
- Precast concrete steps - to be on site the pm of July 9, 1991 (wd 134).
- Manhole and catch basin covers - no current information on this item.
- Precast concrete seat wall - no current information on this item.
- Dampproofing and sealants - no current information on this item.
- Laminated beam brackets - no current information on this item.

The issue 4 and 4x network models were updated from the monitoring inspection and planning at this meeting. The updated issue 5 network, dated May 16, 1991 (wd 097) was combined in a single sheet and issued to Mr. Hansen, Mr. Carter and Mr. Griswold on May 20, 1991 (wd 099) at the job site.

In addition two translations were made of the network model. These included a narrative data run containing all the activities in the network with their early starts and finishes and late starts and finishes. This list is in ascending early start, early finish sequence.

The second translation document was a bar chart of the network model. Early starts and finishes were shown by an open bar, while late starts and late finishes were shown by a black bar. The data listing and the bar chart were issued to the project team at the job site on May 20, 1991 (wd 099).

This monitoring report is being sent to Mr. Hansen and Mr. Carter directly. Further distribution will be by them as desired. I shall be in touch with Mr. Hansen and Mr. Carter shortly to set the next monitoring session.



Ralph J. Stephenson PE

	activity	early start	early finish	late start	late finish
1	001-T/R TO AM APRIL 22, 1991	4/22/91	4/22/91	4/22/91	4/22/91
2	552-PREPARE & SUBMIT FOUNTAIN GRANITE PANEL SHOP DRAWINGS TO MSU - ?	4/22/91	4/22/91	5/8/91	5/8/91
3	539-PREPARE & SUBMIT LIMESTONE CAP SHOP DRAWINGS TO MSU - ?	4/22/91	4/22/91	7/2/91	7/2/91
4	536-SUBMIT CONCRETE & GRANITE PAVER SAMPLES TO MSU - ?	4/22/91	4/22/91	9/10/91	9/10/91
5	555-PREPARE & SUBMIT PRECAST STEPS SHOP DRAWINGS TO MSU - 10	4/22/91	5/3/91	4/22/91	5/3/91
6	553-MSU REVIEW & APPROVE FOUNTAIN GRANITE PANEL SHOP DRAWINGS - 10	4/22/91	5/3/91	5/8/91	5/21/91
7	540-MSU REVIEW & APPROVE LIMESTONE CAP SHOP DRAWINGS - 10	4/22/91	5/3/91	7/2/91	7/16/91
8	537-MSU REVIEW & APPROVE CONCRETE & GRANITE PAVER SAMPLES - 10	4/22/91	5/3/91	9/10/91	9/23/91
9	551-FAB & DELIVER LIMESTONE CAPS - ?	5/3/91	5/3/91	7/17/91	7/17/91
10	538-FAB & DELIVER CONCRETE & GRANITE PAVERS - ?	5/3/91	5/3/91	9/24/91	9/24/91
11	556-MSU REVIEW & APPROVE PRECAST STEP SHOP DRAWINGS -10	5/6/91	5/17/91	5/6/91	5/17/91
12	554-FAB & DELIVER FOUNTAIN GRANITE PANELS - 35	5/6/91	6/24/91	5/22/91	7/11/91
13	T/R TO AM MAY 16, 1991 - ISSUE #5 UPDATING	5/16/91	5/16/91	5/16/91	5/16/91
14	019-COMP FORM, REINF & POUR AREA #1 PIERS FOR FEATURE WALL & PLAZA - 2	5/16/91	5/17/91	6/26/91	6/27/91
15	053-COMP EXCAVATE, FORM, REINF & POUR AREA #2 FOOTINGS & PRECAST COL BASES FOR GAZEBO - 2	5/16/91	5/17/91	8/23/91	8/26/91
16	022-FORM, REINF & POUR AREA #1 SCREEN WALL FOUND WALL ON FOOTINGS - 3	5/16/91	5/20/91	7/3/91	7/8/91
17	502-MSU COMPLETE REVIEW & APPROVE AREAS #1, 2, 3 & 4 PRECAST CONCRETE SHOP DRAWINGS - 5	5/16/91	5/22/91	5/16/91	5/22/91
18	016-COMP ADJUST EXISTING CATCH BASINS STRUCTURES TO NEW ELEVATIONS & INSTALL NEW CATCH BASINS & PIPING - 5	5/16/91	5/22/91	6/26/91	7/2/91
19	041-COMP INSTALL LIGHT POLE ELECTRICAL, BASES & POLES OUTSIDE MAIN CONSTRUCTION AREA - 10	5/16/91	5/30/91	5/16/91	5/30/91
20	521-FAB & DELIVER EARLY LAMINATED WOOD BEAMS - AVAILABLE AS NEEDED FROM 5/16/91	5/16/91	6/6/91	8/12/91	8/30/91
21	066-PLACE & COMPACT AREA #2 BACKFILL TO ROUGH GRADE - 2	5/20/91	5/21/91	8/27/91	8/28/91
22	557-FAB & DELIVER PRECAST STEPS - 35	5/20/91	7/9/91	5/20/91	7/9/91
23	524-FAB & DELIVER BRICK FOR WALLS - 5/21/91	5/21/91	5/21/91	7/8/91	7/8/91
24	026-ERECT MASONRY AT SCREEN WALL IN AREA #1 - 5	5/22/91	5/29/91	7/9/91	7/15/91
25	024-CONSTRUCT AREA #1 LIGHT POLE BASES - 2	5/23/91	5/24/91	7/9/91	7/10/91
26	054-CONSTRUCT AREA #2 LIGHT POLE BASES - 2	5/23/91	5/24/91	8/29/91	8/30/91
27	020-INSTALL ELECTRICAL SLEEVES AT SIDEWALK LOCATIONS IN AREAS #1, 2 & 3 - 3	5/23/91	5/28/91	7/3/91	7/8/91
28	503-FAB & DELIVER AREA #1 PRECAST CONCRETE UNITS - 25	5/23/91	6/27/91	5/23/91	6/27/91
29	526-FAB & DELIVER AREA #2 PRECAST CONCRETE UNITS - 25	5/23/91	6/27/91	7/25/91	8/28/91

	activity	early start	early finish	late start	late finish
30	028-INSTALL AREA #1 UNDERGROUND ELECTRICAL CONDUIT & PULL WIRE - 3	5/28/91	5/30/91	7/11/91	7/15/91
31	060-INSTALL AREA #2 UNDERGROUND ELECTRICAL CONDUIT & PULL WIRE - 3	5/28/91	5/30/91	9/3/91	9/5/91
32	518-FAB & DELIVER BRICK PAVERS - AVAILABLE 6/1/91	6/1/91	6/1/91	7/25/91	7/25/91
33	043-DELIVER REFLECTING POOL EQUIPMENT - 6/3/91	6/3/91	6/3/91	6/3/91	6/3/91
34	529-T/R TO FAB & DELIVER FOUNTAIN EQUIPMENT VAULT - 6/3/91	6/3/91	6/3/91	6/4/91	6/4/91
35	100-EXCAVATE & SET AREA #3 PRECAST CONCRETE EQUIPMENT VAULT FOR FOUNTAIN & INSTALL AIR DUCT - 1	6/3/91	6/3/91	6/4/91	6/4/91
36	025-EXCAVATE FOR AREA #1 REFLECTING POOL & INSTALL UNDERGROUND PLUMBING - 2	6/3/91	6/4/91	6/3/91	6/4/91
37	101-BACKFILL & COMPACT AT AREA #3 FOUNTAIN EQUIPMENT VAULT - 1	6/4/91	6/4/91	6/5/91	6/5/91
38	103-EXCAVATE, FORM, REINF & POUR AREA #3 FOUNTAIN FOOTINGS - 1	6/5/91	6/5/91	6/6/91	6/6/91
39	039-INSTL & COMPACT AREA #1 REFLECTING POOL SUB BASE MATERIAL - 3	6/5/91	6/7/91	6/5/91	6/7/91
40	102-INSTALL AREA #3 FOUNTAIN EQUIPMENT IN VAULT - 10	6/5/91	6/18/91	8/23/91	9/6/91
41	105-FORM, REINF, POUR & STRIP AREA #3 FOUNTAIN FOUNDATION WALLS - 1	6/6/91	6/6/91	6/7/91	6/7/91
42	106-INSTALL AREA #3 FOUNTAIN UNDERGROUND PLUMBING & BASE MATERIAL - 1	6/7/91	6/7/91	6/10/91	6/10/91
43	107-FORM, SET RESTL & PLACE CONCRETE FOR AREA #3 FOUNTAIN CONCRETE SLAB - 1	6/10/91	6/10/91	6/11/91	6/11/91
44	033-FORM, SET RESTL & PLACE CONCRETE FOR AREA #1 REFLECTING POOL - 3	6/10/91	6/12/91	6/10/91	6/12/91
45	108-FORM, REINF & POUR FOUNTAIN WALLS ABOVE SLAB ON GRADE - 5	6/11/91	6/17/91	6/12/91	6/18/91
46	036-CURE & STRIP FORMS AT AREA #1 REFLECTING POOL - 2	6/13/91	6/14/91	6/13/91	6/14/91
47	039-APPLY AREA #1 REFLECTING POOL EXT WATERPROOFING - 1	6/17/91	6/17/91	6/17/91	6/17/91
48	044-COMP BACKFILL REFLECTING POOL AREA - 1	6/18/91	6/18/91	6/18/91	6/18/91
49	109-CURE & STRIP FORMS AT AREA #3 FOUNTAIN - 2	6/18/91	6/19/91	6/19/91	6/20/91
50	110-APPLY AREA #3 FOUNTAIN INT & EXT WATERPROOFING - 3	6/20/91	6/24/91	7/5/91	7/9/91
51	132-EXCAVATE, FORM, REINF & POUR AREA #3 SUNKEN GARDEN WALL FOOTINGS - 4	6/20/91	6/25/91	6/21/91	6/26/91
52	112-PLACE & COMPACT AREA #3 BACKFILL TO ROUGH GRADE - 2	6/25/91	6/26/91	7/17/91	7/18/91
53	133-FORM, SET SLEEVES, REINF & CONDUIT & POUR, STRIP & DAMPPROOF AREA #3 SUNKEN GARDEN CONCRETE WALLS - 7	6/26/91	7/5/91	6/27/91	7/8/91
54	114-START LAY OUT AREA #3 PAVING & SIDEWALK AREAS - 1	6/27/91	6/27/91	7/19/91	7/19/91
55	021-ERECT AREA #1 NORTH ENTRY ARCH PRECAST COLS & ARCH - 2	6/28/91	7/1/91	6/28/91	7/1/91
56	055-ERECT AREA #2 GAZEBO PRECAST COLS - 2	6/28/91	7/1/91	8/29/91	8/30/91
57	057-ERECT AREA #2 LAMINATED WOOD BEAMS AT GAZEBO - 3	7/2/91	7/5/91	9/3/91	9/5/91
58	023-ERECT AREA #1 FEATURE WALL PRECAST COLS & ARCH - 4	7/2/91	7/8/91	7/2/91	7/8/91

arrayed in early start, early finish sequence

	activity	early start	early finish	late start	late finish
59	135-INSTALL 4" UNDERDRAIN FOOTING TILE AT AREA #3 - 1	7/8/91	7/8/91	9/24/91	9/24/91
60	136-CONSTRUCT AREA #3 LIGHT POLE BASES - 2	7/8/91	7/9/91	7/25/91	7/26/91
61	061-INSTALL AREA #2 IRRIGATION & UNDERDRAIN SLEEVES, GRADE, FORM & POUR AREA #2 CONCRETE PAVING AND SIDEWALKS - 3	7/8/91	7/10/91	9/6/91	9/10/91
62	137-INSTALL LIMESTONE CAPS AT SUNKEN GARDEN WALLS - 4	7/8/91	7/11/91	9/24/91	9/27/91
63	134-T/R TO AM JULY 9, 1991 - TO SET CONSERVATORY PLAZA WORK START DATE	7/9/91	7/9/91	7/9/91	7/9/91
64	138-ROUGH GRADE & EXCAVATE AT CONSERVATORY PLAZA - 1	7/9/91	7/9/91	7/9/91	7/9/91
65	139-BACKFILL & COMPACT AREA #3 TO ROUGH GRADE - 1	7/9/91	7/9/91	9/25/91	9/25/91
66	027-FIN GRADE, FORM, SET IRRIGATION SLEEVES & POUR SIDEWALKS AT NORTH ENTRY ARCH & FEATURE WALL - 5	7/9/91	7/15/91	7/9/91	7/15/91
67	140-FORM, REINF & POUR FOOTINGS AT CONSERVATORY PLAZA - 1	7/10/91	7/10/91	7/10/91	7/10/91
68	111-INSTALL PRECAST STEPS IN AREA #3 FOUNTAIN - 2	7/10/91	7/11/91	7/10/91	7/11/91
69	151-CONSTRUCT SUNKEN GARDEN LIGHT POLE BASES, INSTALL UNDERGROUND ELECTRICAL CONDUIT & PULL WIRE - 2	7/10/91	7/11/91	9/26/91	9/27/91
70	152-INSTALL AREA #3 UNDERGROUND ELECTRICAL CONDUIT & PULL WIRE - 3	7/10/91	7/12/91	7/29/91	7/31/91
71	154-FORM, REINF & POUR COLUMNS AT CONSERVATORY PLAZA - 1	7/11/91	7/11/91	7/11/91	7/11/91
72	062-SCARIFY AREA #2 SUBSOIL - 2	7/11/91	7/12/91	9/11/91	9/12/91
73	113-INSTALL AREA #3 FOUNTAIN STONE PANELS - 3	7/12/91	7/16/91	7/12/91	7/16/91
74	155-FORM, REINF & POUR WALLS AT CONSERVATORY PLAZA - 4	7/12/91	7/17/91	7/12/91	7/17/91
75	064-INSTALL AREA #2 SUBDRAINS - 4	7/15/91	7/18/91	9/13/91	9/18/91
76	038-INSTALL BRICK PAVERS AT AREA #1 FEATURE WALL PLAZA - 2	7/16/91	7/17/91	7/25/91	7/26/91
77	030-EXCAVATE, FORM & POUR AREA #1 CONCRETE CURBS AND EDGING - 3	7/16/91	7/18/91	7/16/91	7/18/91
78	115-INSTALL FACE BRICK & LIMESTONE CAPS AT FOUNTAIN TYPE 1 WALL - 3	7/17/91	7/19/91	7/17/91	7/19/91
79	116-INSTALL AREA #3 FOUNTAIN PLUMBING, ELECTRICAL & LIGHTING - 5	7/17/91	7/23/91	7/17/91	7/23/91
80	157-EXCAVATE, FORM & POUR SOUTHWEST CURVED WALL FOOTINGS - 2	7/18/91	7/19/91	7/18/91	7/19/91
81	156-STRIP WALLS, BACKFILL, COMPACT & INSTALL UNDERDRAINS AT CONSERVATORY PLAZA - 2	7/18/91	7/19/91	9/11/91	9/12/91
82	034-SCARIFY AREA #1 SUBSOIL - 2	7/19/91	7/22/91	7/19/91	7/22/91
83	065-EXCAVATE AREA #2 PLANTING BEDS & PLACE TOPSOIL FOR PLANTING BEDS & LAWN AREAS - 5	7/19/91	7/25/91	9/19/91	9/25/91
84	118-INSTALL IRRIGATION & UNDERDRAIN SLEEVES AS REQUIRED & FORM & POUR SIDEWALK AT FOUNTAIN - 3	7/22/91	7/24/91	7/22/91	7/24/91
85	158-INSTALL FACE BRICK & LIMESTONE CAP ON WALLS AT CONSERVATORY PLAZA - 3	7/22/91	7/24/91	9/13/91	9/17/91
86	159-FORM, REINF & POUR SOUTHWEST TYPE 2 CURVED WALL - 5	7/22/91	7/26/91	7/22/91	7/26/91
87	037-INSTALL AREA #1 SUBDRAINS - 4	7/23/91	7/26/91	7/23/91	7/26/91

arrayed in early start, early finish sequence

	activity	early start	early finish	late start	late finish
88	160-FINE GRADE CONSERVATORY PLAZA AREA - 1	7/25/91	7/25/91	9/18/91	9/18/91
89	119-INSTALL IRRIGATION & UNDERDRAIN SLEEVES AS REQUIRED & FORM & POUR SIDEWALK AT SCULPTURE PAD - 2	7/25/91	7/26/91	7/25/91	7/26/91
90	120-INSTALL BRICK PAVERS AT FOUNTAIN - 4	7/25/91	7/30/91	7/25/91	7/30/91
91	163-FORM, REINF & POUR CONCRETE EDGING AT CONSERVATORY PLAZA - 1	7/26/91	7/26/91	9/19/91	9/19/91
92	066-FINE GRADE AREA #2 - 2	7/26/91	7/29/91	9/26/91	9/27/91
93	161-STRIP SOUTHWEST TYPE 2 CURVED WALL, & DAMPPROOF & SANDBLAST - 1	7/29/91	7/29/91	7/29/91	7/29/91
94	166-FINE GRADE, FORM & POUR CONCRETE PAVING AT CONSERVATORY PLAZA - 2	7/29/91	7/30/91	9/20/91	9/23/91
95	040-EXCAVATE AREA #1 PLANTING BEDS & PLACE TOPSOIL FOR PLANTING BEDS & LAWN AREAS - 3	7/29/91	7/31/91	7/29/91	7/31/91
96	121-INSTALL IRRIGATION & UNDERDRAIN SLEEVES AS REQUIRED & FORM & POUR SIDEWALK AT NORTH OF SUNKEN GARDENS - 3	7/29/91	7/31/91	7/29/91	7/31/91
97	162-EXCAVATE, FORM, REINF & POUR WEST ENTRANCE TRELLIS FOOTINGS & COL BASES IN AREA #4 - 4	7/29/91	8/1/91	9/11/91	9/16/91
98	164-INSTALL SUBDRAINS AT SOUTHWEST CURVED WALL & BACKFILL & COMPACT - 1	7/30/91	7/30/91	7/30/91	7/30/91
99	122-INSTALL BRICK PAVERS AT SCULPTURE PAD - 1	7/31/91	7/31/91	7/31/91	7/31/91
100	167-FORM, REINF & POUR CONCRETE EDGING AT SOUTHWEST CURVED WALL - 1	7/31/91	7/31/91	7/31/91	7/31/91
101	170-INSTALL BRICK PAVERS & GRANITE PAVERS AT CONSERVATORY PLAZA - 4	7/31/91	8/5/91	9/24/91	9/27/91
102	051-FINE GRADE AREA #1 (SUFFICIENT TO ALLOW STUDENT TRAFFIC) - 2	8/1/91	8/2/91	8/1/91	8/2/91
103	171-SCARIFY SOUTH PORTION OF CONSERVATORY PLAZA & INSTALL SUB DRAINS - 2	8/1/91	8/2/91	8/1/91	8/2/91
104	123-FORM, REINF, POUR & STRIP CONCRETE EDGING AT REFLECTING POOL - 4	8/1/91	8/6/91	8/1/91	8/6/91
105	165-BACKFILL & COMPACT AREA #4 WEST ENTRANCE TRELLIS FOOTINGS TO ROUGH GRADE - 1	8/2/91	8/2/91	9/17/91	9/17/91
106	168-INSTALL AREA #4 PRECAST COLS AT WEST ENTRANCE TRELLIS - 3	8/5/91	8/7/91	9/18/91	9/20/91
107	174-EXCAVATE SOUTH CONSERVATORY PLAZA PLANTING AREAS, PLACE TOPSOIL & FINE GRADE - 7	8/5/91	8/13/91	8/5/91	8/13/91
108	125-INSTALL IRRIGATION & UNDERDRAIN SLEEVES AS REQUIRED & FORM, REINF, POUR & STRIP CONCRETE EDGING AT WEST SIDEWALK - 1	8/7/91	8/7/91	8/7/91	8/7/91
109	124-INSTALL IRRIGATION & UNDERDRAIN SLEEVES AS REQUIRED & FORM & POUR SIDEWALKS AT NORTH OF SUNDIAL PLAZA - 3	8/7/91	8/9/91	8/7/91	8/9/91
110	172-FINE GRADE & PLACE CONCRETE FOR AREA #4 WEST ENTRANCE TRELLIS SIDEWALKS - 1	8/8/91	8/8/91	9/23/91	9/23/91
111	127-INSTALL IRRIGATION & UNDERDRAIN SLEEVES AS REQUIRED & FORM & POUR CONCRETE SIDEWALKS AT NORTH OF WEST ENTRANCE TRELLIS - 2	8/8/91	8/9/91	8/8/91	8/9/91
112	175-INSTALL LAMINATED WOOD BEAMS AT AREA #4 WEST ENTRANCE TRELLIS - 4	8/9/91	8/14/91	9/24/91	9/27/91
113	126-FORM & POUR PAVEMENT AT SUNDIAL PLAZA - 5	8/12/91	8/16/91	8/12/91	8/16/91
114	128-INSTALL BRICK PAVERS AT SUNDIAL PLAZA - 4	8/19/91	8/22/91	8/19/91	8/22/91
115	129-INSTALL IRRIGATION & UNDERDRAIN SLEEVES AS REQUIRED & FORM & POUR SIDEWALKS SOUTH OF SUNKEN GARDEN - 4	8/23/91	8/28/91	8/23/91	8/28/91
116	130-SCARIFY SUNKEN GARDEN AREA & INSTALL SUB DRAINS - 5	8/29/91	9/5/91	8/29/91	9/5/91

arrayed in early start, early finish sequence

	activity	early start	early finish	late start	late finish
117	177-T/R TO REMOVE ALL HEAVY EQUIPMENT FROM AREA EAST OF CURVED WALLS - ASSUME AT AM 9/3/91	9/3/91	9/3/91	9/3/91	9/3/91
118	524-MSU PROVIDE HISTORIC LIGHT POLES - 09/03/91	9/3/91	9/3/91	9/30/91	9/30/91
119	178-EXCAVATE, FORM & POUR NORTHWEST CURVED WALL FOOTINGS - 2	9/3/91	9/4/91	9/3/91	9/4/91
120	179-FORM, REINF & POUR NORTHWEST TYPE 2 CURVED WALL - 5	9/5/91	9/11/91	9/5/91	9/11/91
121	191-EXCAVATE SUNKEN GARDEN PLANTING AREA & PLACE TOPSOIL & FINE GRADE - 10	9/6/91	9/19/91	9/6/91	9/19/91
122	180-STRIP NORTHWEST TYPE 2 CURVED WALL, & DAMPPROOF & SANDBLAST 1	9/12/91	9/12/91	9/12/91	9/12/91
123	182-CONSTRUCT LIGHT POLE BASES AT NORTHWEST CURVED WALL AREA & INSTALL UNDERGROUND ELECT CONDUIT & WIRE - 1	9/13/91	9/13/91	9/13/91	9/13/91
124	183-INSTALL SUBDRAINS AT NORTHWEST CURVED WALL & BACKFILL & COMPACT - 1	9/13/91	9/13/91	9/13/91	9/13/91
125	185-FORM, REINF & POUR CONCRETE EDGING & SIDEWALK CONNECTING CONSERVATION PLAZA TO TRELIS AT NORTHWEST CURVED WALL - 1	9/16/91	9/16/91	9/16/91	9/16/91
126	186-INSTALL IRRIGATION & UNDERDRAIN SLEEVES AS REQUIRED & FORM & POUR NORTH - SOUTH SIDEWALK SOUTH OF TRELIS - 1	9/17/91	9/17/91	9/17/91	9/17/91
127	187-SCARIFY NORTH PORTION OF CONSERVATORY PLAZA TO WEST WALK & INSTALL SUB DRAINS - 2	9/17/91	9/18/91	9/17/91	9/18/91
128	188-FORM, REINF & POUR NORTH - SOUTH CONCRETE EDGING AT SOUTH OF TRELIS - 1	9/18/91	9/18/91	9/18/91	9/18/91
129	190-REPLACE ANY CONSTRUCTION DAMAGED CONCRETE - 3	9/19/91	9/23/91	9/20/91	9/24/91
130	201-SCARIFY REMAINING AREA #4 SUBSOIL & INSTALL SUB DRAINS - 4	9/19/91	9/24/91	9/19/91	9/24/91
131	189-EXCAVATE NORTH CONSERVATORY PLAZA PLANTING AREAS, PLACE TOPSOIL & FINE GRADE - 7	9/19/91	9/27/91	9/19/91	9/27/91
132	202-EXCAVATE FOR REMAINING AREA #4 PLANTING BEDS, PLACE TOPSOIL & FINE GRADE - 4	9/25/91	9/30/91	9/25/91	9/30/91
133	048-T/R TO SEPTEMBER 30, 1991 TO AVOID CONSTRUCTION DAMAGE	9/30/91	9/30/91	9/30/91	9/30/91
134	142-INSTALL LIGHT FIXTURES ON TOP OF LIMESTONE CAPS AT SUNKEN GARDEN WALLS - 1	9/30/91	9/30/91	9/30/91	9/30/91
135	046-INSTALL AREA #1 LIGHT POLES - 2	9/30/91	10/1/91	9/30/91	10/1/91
136	063-INSTALL AREA #2 LIGHT POLES - 2	9/30/91	10/1/91	9/30/91	10/1/91
137	141-INSTALL AREA #3 LIGHT POLES - 2	9/30/91	10/1/91	9/30/91	10/1/91
138	173-INSTALL LIGHT FIXTURES ON TOP OF CONSERVATORY PLAZA WALLS - 2	9/30/91	10/1/91	9/30/91	10/1/91
139	184-SET LIGHT POLES AT AREA #4 - 3	9/30/91	10/2/91	9/30/91	10/2/91
140	176-INSTALL ELECTRICAL AT AREA #4 LAMINATED WOOD BEAMS - 5	9/30/91	10/4/91	9/30/91	10/4/91

arrayed in early start, early finish sequence

Ralph J. Stephenson PE PC
Consulting Engineer

July 1, 1991

Subject: Monitoring Report #5

Project: Michigan State University
Horticultural Demonstration Gardens
North Garden
East Lansing, Michigan

To: Dennis Hansen - Owner's representative - MSU
Jerry Carter - Project manager - MTC

From: Ralph J. Stephenson - Consultant

RJS project: 91:08

Date of monitoring: June 24, 1991 (wd 123)

Monitored from:

- Sheet 1, issue #5 dated May 16, 1991 (wd 097)
- Sheet 2, issue #5 dated May 16, 1991 (wd 097)

Key dates:

- October 15, 1991 pm (wd 203) - Completion date for all cast in place concrete.
- November 30, 1991 pm (wd 235) - Final project completion date.
- May 1, 1992 pm (wd 343) - Completion date for replacement of damaged and left out concrete. Note: This date is not as yet official but is being considered.

Number of working days remaining from June 24, 1991 am (wd 123) to November 30, 1991 pm (wd 235) = 112.

Those attending:

- Mr. Dennis Hansen MM - MSU owner's representative - in meeting part time
- Mr. Jerry Carter - MTC project manager
- Mr. Ted Moore - MTC - in meeting part time
- Ralph J. Stephenson - consultant

Actions taken:

- Inspected project
- Reviewed current status of project with Mr. Carter & Mr. Hansen
- Updated sheets #1 & 2 to issue #6, dated June 24, 1991 (wd 123) with Mr. Carter and Mr. Hansen
- Printed sheets #1 & 2, issue #6, dated June 24, 1991 (wd 123) and gave to Mr.

Ralph J. Stephenson PE PC
Consulting Engineer

July 1, 1991

Hansen for distribution and interim use.

General Summary:

Currently the project is progressing fairly well although erratic deliveries of materials, equipment and assemblies has caused some localized delays. Much of the major foundation work for walls and structures has been completed and present efforts are being concentrated on initiating and maintaining the flow of work from area #1 (north entry, feature wall and plaza, reflecting pool, screen wall), to area #2 (gazebo), to area #3 (fountain, sunken garden, sculpture pad, sundial plaza, to area #4 (west entrance plaza, conservatory plaza).

It is still of great importance that construction operations move out of well defined successive areas so as provide the maximum protection to finished sub base at each area by minimizing construction traffic over the completed work.

At the north entry area most foundation work is complete and precast is expected on the job site in late June, 1991. Precast concrete deliveries are still somewhat uncommitted and must be expedited continuously. These are critical elements of the project.

The reflecting pool was poured out on June 7, 1991 (wd 112) and the area has been backfilled. Precast caps for the pool are expected on the job in accordance with change order #1 in early August, 1991.

Screen wall masonry is nearly complete and will be ready for precast caps as they arrive on the job. Other work in area #1 will proceed as it is released by restraining construction.

Area #2 foundations at the gazebo are now ready to receive the precast columns and subsequently the laminated wood beams. Columns are planned for delivery in early or mid July, 1991.

Light poles outside the main construction areas can be installed at any time.

The precast equipment vault in area #3 has been delivered and as of June 24, 1991 (wd 123) was set and equipment layout and piping inside the vault had begun. Once backfilling at the vault is complete, work on the fountain foundation will begin.

Sunken garden, sculpture pad and sundial plaza work will proceed as released by adjoining construction operations.

Ralph J. Stephenson PE PC
Consulting Engineer

July 1, 1991

Conservatory plaza installation at area #4 has proceeded well and concrete walls at the plaza have been built. Construction will proceed on remaining wall footings as released by completion of restraining work in other areas.

Overall, field work seems to be proceeding reasonably well and is generally meeting major dates between early and late starts and finishes except at the fountain and related areas. This work was delayed by a late delivery of the precast equipment vault.

Deliveries of precast concrete units and granite panels must be watched carefully since the entire major phasing of the project makes it imperative that the work move from area #4 to area #1 in sequence.

A brief summary of procurement status to the extent of current information available at our monitoring of June 24, 1991 (wd 123) is summarized below.

- Precast concrete columns & arches - due on site beginning June 27, 1991 (wd 126)
- Laminated wood beams - available as needed.
- Limestone caps and copings - to be on site August 15, 1991 (wd 160)
- Granite - to be on site July 24, 1991 (wd 144)
- Fountain equipment - installation due to begin July 1, 1991 (wd 128)
- Historic light poles to be furnished by MSU in early September, 1991.
- Regular light poles - no current information on this item
- Precast caps and copings - to be on site in early August, 1991
- Brick pavers - available as needed
- Concrete pavers - no current information on this item.
- Granite pavers - no current information on this item.
- Precast concrete steps - to be on site the pm of July 9, 1991 (wd 134).
- Manhole and catch basin covers - no current information on this item.
- Precast concrete seat wall - no current information on this item.
- Dampproofing and sealants - no current information on this item.
- Laminated beam brackets - no current information on this item.

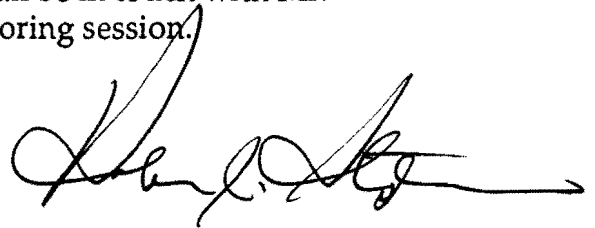
The issue #5 network models dated May 16, 1991 (wd 097) were updated at this meeting and the late starts and finishes set in accordance with the requirements to complete concrete flat work by the pm of October 15, 1991 (wd 203). Other late finishes and starts were set by the contract completion date. In addition the Owner is considering setting a permissible finish date, if needed, of May 1, 1992 (wd 343) for replacement of damaged and left out concrete. This is not official as yet.

Ralph J. Stephenson PE PC
Consulting Engineer

July 1, 1991

The updated network models were printed at the meeting and provided to Mr. Hansen. He furnished copies to Mr. Carter. The updated networks were further checked, corrected, rerun, and directly mailed to Mr. Hansen and to Mr. Carter for their comments and desired revisions. They are being reviewed at present by Mr. Hansen and Mr. Carter. Once the network model is satisfactory additional translations will be made and issued as needed.

This monitoring report is being sent to Mr. Hansen and Mr. Carter directly. Further distribution will be by them as desired. I shall be in touch with Mr. Hansen and Mr. Carter shortly to set the next monitoring session.

A handwritten signature in black ink, appearing to read 'Ralph J. Stephenson', with a long horizontal flourish extending to the right.

Ralph J. Stephenson PE

Ralph J. Stephenson P.E. P.C.
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph 517 772 2537
July 6, 1991

Dennis R. Hansen
Site Construction Superintendent
Michigan State University
Division of Campus Park & Planning
412 Olds Hall
East Lansing, Michigan 48824-1047

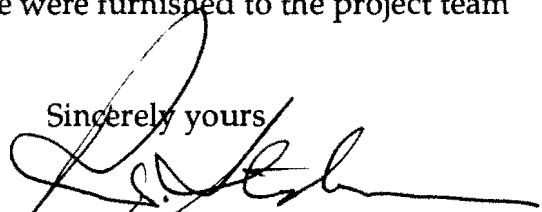
Re: Summary of work on the MSU Horticultural Demonstration Gardens, North Garden, East Lansing, Michigan - May, 1991

Dear Mr. Hansen:

Recently you asked me to provide you a summary of my planning and monitoring activities on the MSU Horticultural Gardens with my billings on the project. Currently I have already received payment for my invoice #8351 dated June 12, 1991 and covering the period from May 5, 1991 through June 1, 1991. However a brief review of my activities during that period is given below.

- May 8, 1991 - Made brief visit to site to determine general condition of project. Talked to Mr. Hansen of MSU and Mr. Keith Griswold, superintendent for Moore Trospen, about the project. Requested they review the issue #3 network model prepared at our April 22, 1991 meeting and send me their comments and indicate the revisions they desired be made.
- May 16, 1991 - Inspected project and reviewed current status of the project with Mr. Keith Griswold. After the inspection met with Mr. Jerry Carter, project manager and Mr. Griswold to update the issue #4 network model. Updated the model and prepared copy for Mr. Griswold's interim use until I could prepare and issue the full update.
- May 17, 1991 to June 1, 1991 - Prepared monitoring report #4 and completed & distributed full update of network model to issue #5. Prepared supplementary translations of issue #5 network including a narrative data run and an early start, early finish, late start, late finish bar chart. These were furnished to the project team on May 20, 1991 at the job site.

Sincerely yours



Ralph J. Stephenson PE

Ralph J. Stephenson P.E. P.C.
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph 517 772 2537
July 16, 1991

Dennis R. Hansen R.L.A.
Site Construction Superintendent
Michigan State University
Division of Campus Park & Planning
412 Olds Hall
East Lansing, Michigan 48824-1047

Re: *Summary of work on the MSU Horticultural Demonstration Gardens, North Garden, East Lansing, Michigan - June, 1991*

Dear Mr. Hansen:

Below is given a summary of my planning and monitoring activities on the MSU Horticultural Gardens during the period from June 2, 1991 through June 30, 1991. This work is billed on the enclosed invoice #8356, dated July 5, 1991.

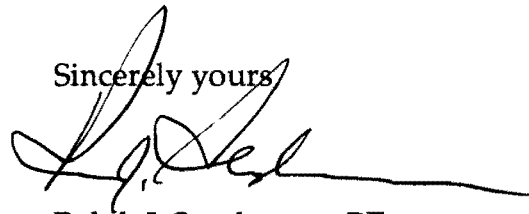
- June 3, 1991 to June 24, 1991 - Made brief inspection of site. No official monitoring report was prepared from these informal visits. Prepared for formal monitoring inspection on June 24, 1991.

- June 24, 1991 - Inspected project and reviewed current status of project. Met with Mr. Hansen, Mr. Carter and Mr. Ted Moore after inspection and made full update of network model from issue #5 to issue #6. Printed and issued rough copies of the updated networks to Mr. Hansen for his immediate use.

June 25, 1991 to June 30, 1991 - Completed and distributed copies of the issue #6 network diagram to Mr. Hansen and Mr. Carter. Checked by phone with Mr. Hansen on revisions he wished to make to this issue.

Reviewed the impact of contract dates on late starts and finishes with Mr. Hansen. Prepared and sent monitoring report #5 to Mr. Hansen and Mr. Carter.

Sincerely yours



Ralph J. Stephenson PE

Ralph J. Stephenson PE PC
Consulting Engineer

August 29, 1991

Subject: Monitoring Report #6

Project: Michigan State University
Horticultural Demonstration Gardens
North Garden
East Lansing, Michigan

To: Dennis Hansen - Owner's representative - MSU
Jerry Carter - Project manager - MTC

From: Ralph J. Stephenson - Consultant

RJS project: 91:08

Date of monitoring: August 23, 1991 (wd 166)

Monitored from:

- Sheet 1, issue #6 dated June 24, 1991 (wd 123)
- Sheet 2, issue #6 dated June 24, 1991 (wd 123)

Key dates:

- October 15, 1991 pm (wd 203) - Completion date for all major cast in place concrete.
- November 30, 1991 pm (wd 235) - Final project completion date.

Note: Mr. Hansen said at our monitoring meeting that the contractor has been given a one month extension of contract time for work to be completed in 1991 except for major cast in place concrete work.

- May 1, 1992 pm (wd 343) - Completion date for replacement of damaged and left out concrete, and for weather sensitive systems and finish work at the fountain area.

Number of working days remaining from August 23, 1991 (wd 166) to November 30, 1991 pm (wd 235) = 69.

Those attending:

- Mr. Dennis Hansen - MSU owner's representative

August 29, 1991

- Mr. Jerry Carter - MTC project manager
- Mr. Keith Griswold - MTC field superintendent
- Ralph J. Stephenson - consultant

Actions taken:

- Inspected project with Mr. Keith Griswold, Mr. Carter and Mr. Hansen
- Reviewed current status of project with Mr. Carter, Mr. Hansen and Mr. Griswold
- Updated sheets #1 & 2 to issue #7, dated August 23, 1991 (wd 166) with Mr. Carter, Mr. Griswold and Mr. Hansen

General Summary:

As of August 23, 1991 (wd 166) overall project progress has been fair to good. In some areas the job is rapidly approaching late start and finish dates which reduces the amount of float or discretionary time available for the work. This is particularly the case at the northeast corner of the project where student access is desired to adjoining building entrances no later than the AM of September 23, 1991 (wd 186).

In addition, there continues to be some difficulty in procurement of materials. Nevertheless the project team has revised sequencing patterns as needed to allow work to continue at a relatively high level of productivity.

At the north entry area precast columns are erected, some sidewalks are in place and work continues on underground electrical installation. It is necessary to complete enough work in this area to allow student access as described above. Some modifications in durations were needed to meet this required access date, and it would be appreciated if Mr. Carter, Mr. Griswold and Mr. Hansen would carefully check the sequence of work shown on Sheet #1 from activity 020 through 051 and their durations. If any changes are required as a result of this review please call me.

Most other work in area #1 appears to be moving well and meeting dates between early and late starts and finishes.

At the gazebo, columns are erected and are substantially ready to receive laminated wood beams. Erection of these are due to begin on September 3, 1991 (wd 172).

Work at the sunken garden area has proceeded well with most of the walls

Ralph J. Stephenson PE PC
Consulting Engineer

August 29, 1991

constructed excepted at a relatively small access area on the southwest corner of the garden area.

Fountain equipment is in place. However it has been decided to hold off installing stone finishes and making final trim connections at the fountain until next spring. This work is shown starting on April 1, 1992 (wd 320) and will be finished concurrently with installation of left out concrete and replacement of damaged concrete.

In the network for the fountain, sculpture pad and sundial plaza area, the durations of a few of the related activities from 101 to 129 on sheet 2 had to be reduced slightly to meet end date requirements for concrete to be completed by October 15, 1991 (wd 203). It would be appreciated if Mr. Carter, Mr. Griswold and Mr. Hansen would check the durations for activities 121, 126, 128, and 129 to see if they are reasonable. If there are any changes or questions, please call me.

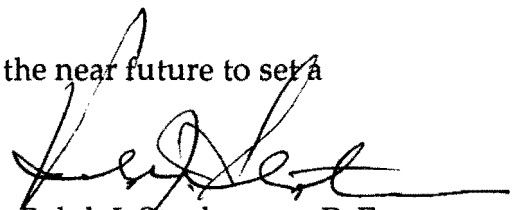
At the conservatory plaza considerable concrete sidewalk area has been installed and work appears to be moving well. South curved wall footings and walls are under construction. The present intent is to delay major work on the north curved wall until heavy equipment is removed from the site at the east of the wall. Mr. Griswold has estimated this date to be in early or mid September, 1991.

Most major field work is currently meeting major plan and schedule targets between early and late starts and finishes. However care must be taken to continue expediting all deliveries yet to be completed, particularly those of finish materials.

The issue #6 network models have been updated from observations at this monitoring to issue #7, dated August 23, 1991 (wd 166). If the plan revisions accurately reflect the intended course of action it is possible that no additional network updating will be needed. However I shall plan to inspect and monitor the project again in mid or late September, 1991.

The revised networks have been printed and are enclosed with this report. It would be appreciated if Mr. Hansen and Mr. Carter would further distribute the network models as desired.

I shall be in touch with Mr. Hansen and Mr. Carter in the near future to set a mutually convenient date for the next monitoring.



Ralph J. Stephenson P. E.

COPY

Ralph J. Stephenson P.E. P.C.
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph 517 772 2537
March 11, 1991

Dennis R. Hansen, M.M. *R.L.A.*
Site Construction Superintendent
Michigan State University
Division of Campus Park & Planning
412 Olds Hall
East Lansing, Michigan 48824-1047

Re: ***Proposal for network planning of new horticultural gardens - North Garden - Michigan State University***

Dear Mr. Hansen:

In accordance with your recent request, outlined below is a proposed method by which my professional network planning and scheduling services could be provided to you for construction planning of the new horticultural gardens located adjacent the Plant and Soil Sciences building on the campus of Michigan State University in East Lansing, Michigan.

The project is divided into several components that are to be built in a structured sequence as set by requirements outlined in the contract documents. This sequence is to be adhered to wherever possible and deviations must be carefully reviewed with you and the design team.

Due to the need for close control and tracking of the project I am to prepare and monitor a network model for the entire project. In this effort I shall work in close conjunction with you and the selected contractor to prepare detailed work sequence plans for the necessary components. I shall also visit, inspect and monitor the project on a regular basis during its construction. Monitoring reports will be prepared and distributed to you and the prime contractor at the conclusion of each inspection visit.

From time to time it may be necessary to update the network models. Updating, however should normally be kept to a minimum; but when the need arises, I shall review this matter with all parties concerned and if the updating is truly needed, prepare and issue revised job network models.

My fees for professional services as outlined above are \$85 per hour plus reimbursement for miscellaneous reproduction of network models and other job related material used in the

Ralph J. Stephenson P.E. P.C.
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph 517 772 2537
March 11, 1991

planning, scheduling and monitoring work. Time and expenses in the interest of the project will be billed monthly.

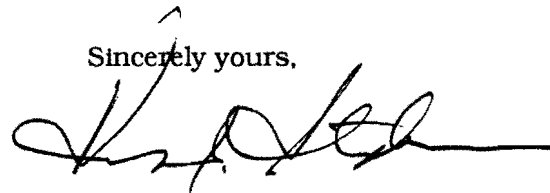
I estimate that about 105 total hours will required to accomplish the work defined above and that miscellaneous reproduction expenses for the project will run \$300 to \$400.

I shall expect to work directly with the contractor selected and you in the preparation of the network. This diagraming should be started soon after selection of the apparent successful prime contractor. It would be well to complete as much of the early planning as possible before the start of field operations in early April, 1991.

I will be in touch with you shortly to set the time and place of the initial planning meetings. We should try to meet near the job site and in a space that has a chalk board and generous table space available. The classrooms at the Plant and Soil Science building are good meeting facilities and if available may be a convenient central area for our planning and scheduling efforts.

I'm looking forward to participating with you in this very important Michigan State University project. Thank you very much for your courtesy and consideration.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'R. Stephenson', written over the typed name below.

Ralph J. Stephenson PE