RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

August 11, 1977

Subject: Monitoring Report #1

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #1 dated August 5, 1977

Date of Monitoring: August 5, 1977 (working day 153)

Start of construction: Mid-July 1977

Target completion date: Early February 1979

Actions taken:

- Prepared preliminary network models for units A and B through completion of structure
- Simulated various form moves

General

The main purpose of this session was to make a detailed review of the early work expected to be accomplished on the project and to prepare a network model for the full building up through close-in. There was a number of alternatives in respect to constructing the structure, therefore, we completed only the preliminary networks through construction of the superstructure. Close-in and further work will be concentrated upon at subsequent sessions.

The network diagrams prepared as the result of this meeting were left with Mr. Maury Montpas and he will have them printed and distributed as required. Sheet #2 contains the foundation and the superstructure work for building B. Sheet #3 contains the foundation and superstructure work for building A.

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Present plans call for building work generally to move from B to A. Foundation work in B has begun and is expected to proceed on through with floor slab on grade being poured out by October 12, 1977 (working day 200). At that point form work for the second floor deck will be erected. Mr. Wirtz, superintendent for Sorensen Gross, estimated that it will require six pours to complete the structure of the B building.

Meanwhile work will be proceeding on A building and when the floor slab on grade at the basement of the A building has been constructed, form work for the first floor supported deck will be put into work. Form work will be moved generally from B to A except for early A building form work which will be new.

It is important to emphasize that a decision has been made as of now to install all underground plumbing at the basement floor slab of the A building and to pour a portion of the basement slab on grade prior to starting forming for the first floor. A review of the present engineering drawing shows that there are additional underground pipe layouts that must be distributed. This was emphasized as being a very important and critical task. The architect engineer and the owner will give immediate attention to this.

Underground plumbing for the basement is considerable and is expected to take from eight to nine weeks. Therefore, installation will have to start just as quickly as foundations get out far enough ahead for it to begin without interference. By November 16, 1977 (working day 225) there should be, according to the present Issue #1 plan of work, adequate floor slab on grade placed to allow the first floor deck of A building to begin.

This, along with the October 12, 1977 (working day 200) date for the B building, are extremely critical targets. As it is, pouring for the A building particularly, will be continuing on through the winter and of course, weather delays are expected. It is hoped that the B building structure can be completed prior to the onset of full winter weather which should allow intermittent work to proceed on closing the building and work on interior rough and finish trades to start.

Construction of the A building superstructure will probably proceed on through to May of 1978 with closing in of the building to follow closely after superstructure construction. Keys to pouring out the structure on schedule are several:

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- Effective form movement
- Prompt processing of shop drawings
- Clarification of underground plumbing at the A building ground floor
- Accurate location of all openings and sleeves of the pour slabs
- Good weather

are some.

However, it should be pointed out that to meet the current target of early February of 1979 for completion, it is essential the buildings be held on a tight early schedule.

An advantage to pouring out the B building superstructure,as we have planned it, is that it allows us to start in the most complex interior finishing area first. Most of the long installation time finishes are at the B building.

Other areas may cause problems and should be given special attention. These are the two meeting areas and the pool area. All are open spaces and decks above them will be poured on high scaffolding.

It appears that most delivery items are in reasonably good condition. There has been an early revision to the routing of an outside sewer line. However, this work is expected to be released momentarily and will allow foundation work to proceed full tilt in both the B and A buildings.

The decision was made at this diagramming session to construct the B building utility tunnel along with foundations. However, since the utility tunnel at the A building is outside the main building wall, it will be left till later so that the contractors can concentrate on foundation work that affects construction of the concrete frame above.

I shall be in touch with Mr. Wilson and others concerned regarding our next session which will be in the next month to a month and a half. Meanwhile monitoring will be from Issue #1 dated August 5, 1977.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. R. D. Wilson
(U of M Flint Campus)

Mr. Dick Sly
Sorensen Gross

RALPH J. STEPHENSON, P.E.
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November 3, 1977

Subject: Monitoring Report #2

University of Michigan Flint Campus

University Center (UCEN) Building

Project: 77:55

Monitored from Issue #1 dated August 5, 1977

Date of Monitoring: October 28, 1977 (working day 212)

Start of construction: Mid-July 1977

Target completion date: Between early February and late March 1979

Assume Feb 15, 1979 (543)

Note: Accurate information on the target completion was not available at this meeting. However, the date should be established prior to our next meeting so we can work our construction plan toward the proper goal.

Actions taken:

- Inspected project
- Conferred with Mr. Harold Wirtz re job progress
- Updated sheets 2 and 3 from Issue #1 to Issue #2 dated August 28, 1977
- Prepared full close-in network for both A and B buildings
- Obtained full data re mechanical and electrical work on project

General

As of October 28, 1977 (working day 212) the project has dropped behind in both the A and B units. Presently columns are being constructed in the B unit with floor slab on grade to be completed by the middle of next week. Supported decks are due to be put into full work by Monday, October 31, 1977 (working day 213). The lag at the B unit is from 10

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to 15 working days. Construction at the A unit is well along on foundations, with floor slab on grade ready to be started November 7, 1977 (working day 218). This work was due to begin no later than October 12, 1977 (working day 200) and thus, lags by about 18 working days.

A complete re-evaluation was made of the plan of work for foundations and superstructure and it was found that by imposing the restraints desired and re-evaluating the starting times for supported decks, particularly at the A unit that for both A and B the projected lag could be reduced to 10 working days for the entire project. Although this is a lag not anticipated, it is not at this particular time serious except that it forces the job somewhat further into cold weather than had originally been desired.

There was considerable discussion at our meeting about the need to have the pool area walls well along so as to properly complete the construction of pour A3, the last pour at the first floor slab in the A unit. Some of the materials that are to be built into the wall may prove to be difficult delivery items and should be checked immediately.

11/29/77
- Will block out for light. Will be shipped 12/27 Dec 28 '77 from California
- Templates for window [illegible] will send new ones.

Presently the schedule for pouring the B building structure shows the last pour, pending a further check of the computations, to be made on January 17, 1978 (working day 266). The last pour of the A unit, pour A14, is scheduled for May 15, 1978 (working day 350). All concerned seemed to think these are reasonable targets.

We next discussed the installation of mechanical and electrical rough and finish work in each unit. The areas were broken into B1, B2, and B3, the first, second and third floors of the B unit and into basement, first, second, third floors, penthouse, pool house and mechanical room in the A unit. A full set of time and sequence information was gained from the subcontractors and this will be used to prepare the preliminary network model at our next diagramming session. It was pointed out that these are preliminary estimates of durations and that upon completion of the preliminary model, a full review will be made. It was generally agreed that the durations given would allow movement of operations from space to space about half way along on each task at each floor. We shall reflect this in the network model.

Following work with the subcontractors, we diagrammed the close-in work for both the A and B buildings. Close-in is very complex, primarily because of the close tie of the curtain wall to the total close-in of the

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11/29/77
- Masonry panel must be put up.

buildings. Presently it is the intent to begin erection of exterior masonry on the B building March 1, 1978 (working day 297). Work will proceed concurrently on the west, north and east exterior elevations, as well as on the interior perimeter masonry so as to close the building to weather to the greatest possible extent.

Masonry on the A unit is expected to begin after pour A5 is completely stripped, which is projected at May 2, 1978 (working day 341). Erection of masonry at the A unit will continue on the exterior on around to completion, probably from the north to the east and southeast.

Arch will review Sample Dec 1, 77 (240)

Meanwhile fabrication of curtain wall and glass will proceed for both the B and A units. Field measurements for curtain wall will be taken in the B building once pour B6 has been made and in the A building once pour A 14 has been made. Meanwhile, the bulk of shop drawings for curtain wall work, including B structural steel frames, will go ahead.

Fabrication and delivery of curtain wall glass and aluminum will probably require about 90 working days after shop drawing approval, and after field measurements and dimensional checks on the shop drawings. Thus, curtain wall could be on the job for the B unit in late May or early June 1978 and for the A building in mid-November 1978. There is some thought now that it would be wise to pull the two deliveries together so it all comes at the same time. This, of course, would help minimize potential damage to the curtain wall in the field. It is a decision that will have to be made by the contracting groups in conjunction with the owner. We shall monitor this activity at our next planning session.

It is expected by the Sorensen Gross staff that interior work at the B unit could proceed soon after the exterior masonry and insulation and roofing are laid at the unit. This is expected to be somewhere in mid or late May 1978. Finish work at the A unit could probably proceed after erection of all masonry and laying of insulation and roofing which will be probably about late September 1978.

If this is the case, probably the work on each unit can be completed in the appropriate and required time. However, it is to be cautioned that there still will be finish work to be completed in areas adjoining late delivery curtain wall. This will not be easy work to finish and we will make additional evaluations of the finishing needs based upon the present delivery schedule of curtain wall.

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At our next session we should plan to diagram as much of the rough and finish interior work as possible. I would like to complete the network at this time and shall be in touch with Mr. Wilson regarding our next meeting.

In summary, the project is currently 10 to 18 working days behind the Issue #1 network model dated August 5, 1977. An updating of the network shows that this lag can be reduced to about 10 working days for the entire project in the structural frame. We, therefore, used this lag position for making our close-in evaluation. Close-in of the project will be extremely important and will require considerable additional study before deciding upon a full plan of work.

Meanwhile we shall monitor the close-in operations from Issue #2 dated October 28, 1977 (working day 212) of sheet 4 for the project. I have had a reverse sepia prepared of this sheet and sent to Mr. Morry Montpas at the University of Michigan Flint office. I shall proceed to have sheet 4 drafted into final form and sheets 2 and 3 revised according to our meeting today.

There has been some indication by the contracting forces that they would like a computer printout so we shall plan to computerize the three sheets with the remaining work to be done. All close-in key points will be made critical as per our discussion with the contractors.

Ralph J. Stephenson, P.E.

RJS
m

To: Mr. R. D. Wilson
(U of M Flint Campus)

Mr. Dick Sly
Sorensen Gross

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

December 2, 1977

Subject: Monitoring Report #3

University of Michigan Flint Campus

University Center (UCEN) Building

Project: 77:55

Monitored from Issue #2 dated October 28, 1977

Date of Monitoring: November 29, 1977 (working day 233)

Start of construction: Mid-July 1977

Target completion date: February 15, 1979 (working day 543)

Actions taken:

- Inspected project
- Conferred with Mr. Harold Wirtz re job progress
- Distributed Issue #2 drawings dated October 28, 1977
- Reviewed floor pour and close-in networks for units
- Prepared interior network plans for B building

General

As of November 29, 1977 (working day 233) the project lags the Issue #2 network dated October 28, 1977 by 7 to 10 working days in the B building and by 8 working days in the A building. The weather over the past two weeks has been very difficult and has caused delays to concrete work. Also, there have been difficult water conditions at the site and some elevation problems encountered in the footings, particularly in the A building.

Presently the B building second deck (pours B1 and B2) are formed and B1 is nearly ready for pouring. The heavy snows recently have caused a delay until the deck and resteel can be cleaned. Mr. Wirtz, however, reports he should be able to pour Thursday, December 1, 1977 (working day 235). This will be 10 working days later than the original target. Since the B2 deck is well along, it might be possible to pick up some time there if the weather holds.

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At the A building, the first deck is to be started up today which gives a direct lag of 8 working days in pour A1.

There have been some severe problems in getting built-in items for the swimming pool area and since pool walls are important to construction of the first floor slab this may cause delays. Mr. Wirtz intends to block out for the lights which now are to be shipped on December 27, 1977 (working day 252) from California. Chances are that they will not arrive before the wall is poured. There is also a need for window templates at the swimming pool walls. These were sent some time ago but apparently were lost. There are tracers on the shipment but if they cannot be found immediately, a duplicate set of templates is to be air freighted to the job. Swimming pool walls are critical.

It was decided at our monitoring conference that we will maintain the Issue #2 dates arrived at on October 28, 1977 (working day 213) as targets. These have been used in projecting the interior finish work for the B unit.

After thoroughly monitoring the project, we discussed sequencing of interior work. It was decided that in the B building we would do our rough and finish work starting at the first floor, moving to the second and then to the third. In the A building it was decided to begin rough work in the basement, proceed to the first floor and pool area and then up to the second floor and then the third floor. It is possible in the A unit finishing could move from the top floor down. Present plans are to finish at A3 down to A2 and out on A1 with basement finishing being done concurrently with the upper floors. This will be discussed again in detail at subsequent meetings as we diagram the A building.

The diagramming of B building interior work indicates there will be several major points along the way that will be critical to progress. These deal fundamentally with floor pours, partial close-in and then erection of the curtain wall to give the south elevation protection from weather. The information is summed up on sheets 5, 6 and 7 of Issue #3 dated November 29, 1977 (working day 233). These are rough diagrams prepared for the rough and finish work. They indicate the first floor of the B unit can be completed as early as August 21, 1978 (working day 418), the second floor at September 12, 1978 (working day 433) and the third floor at October 3, 1978 (working day 448). These are preliminary calculations and subject to check. Distribution of these networks has been limited since they are presently only very preliminary. They should be reviewed by the owner and the field managers before release. I have sent copies to Mr. Wirtz, Mr. Sly and Mr. Montpas, and Mr. Jack Stephens at the architect's office. It would be appreciated if they could be reviewed for content and durations by all concerned.

As part of our discussion it was brought out that utility space above the ceilings is extremely limited in both buildings. I strongly recommend that an intensive review be made of potential interferences at the B building

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particularly since it will be only a short time until some rough work above the ceilings could be installed. It is wise to iron out potential problems early before they occur. It should be remembered that one of the basic functions of project management is to insure the number of pre-solved problems is kept to a maximum. This encourages a pleasantly surprised rather than rudely awakened job attitude.

As part of our work, we also discussed approval of brick sample walls. Apparently there have been no formal approvals given on the brick range, nor on other visual elements so essential to the appearance of masonry walls. It is the intent to erect a masonry wall sample as quickly as possible and to get the design architect in from the east to review and make the final approval on it. Approval is quite important since it is the present intent to start work on masonry March 1, 1978 (working day 297). This is only 64 working days from today and does not give much time for manufacture and delivery. It is particularly crucial since many brick kilns were shut down last year because of a shortage of gas and the present cold weather indicates we could have similar difficulties this year.

UCEN success will depend to a great extent upon the timely submission of all elements of the project, and subsequently prompt approvals of such elements. We shall at our next session focus heavily on front end deliveries that could cause problems over the next few months. It would be wise to make a list of these that are potential disruptions to good job progress so we have them available for discussion.

In summary, the project currently lags the Issue #2 network dated October 28, 1977 (working day 212) by approximately 10 working days. It is possible that this lag will be picked up in part or totally and thus, we are maintaining the target dates shown in that Issue #2 network. Copies were distributed to Mr. Morrey Montpas, Mr. Harold Wirts and Mr. Jack Stephens. There were some minor errors in the diagrams - these were corrected on the copies.

The project is showing some early signs of difficulties in getting timely approvals and releases on early critical items but it is anticipated by careful designation of authority and responsibility patterns this problem can be minimized in the very near future.

I shall plan to monitor the project again in late December or early January 1978 and will be in touch with Mr. Wilson regarding the next session.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. R. D. Wilson
(U of M Flint Campus)

Mr. Dick Sly
Sorensen Gross

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

January 21, 1978

Subject: Monitoring Report #4

University of Michigan Flint Campus

University Center (UCEN) Building

Project: 77:55

Monitored from Issue #2 dated October 28, 1977 and Issue #3 dated November 29, 1977 (sheets 5, 6 and 7)

Date of Monitoring: January 6, 1978 (working day 259)

Start of construction: Mid-July 1977

Target completion date: February 15, 1979 (working day 543) (to be confirmed)

Actions taken:

- Inspected project
- Conferred with Mr. Harold Wirtz re job progress
- Distributed Issue #2 and Issue #3 drawings dated October 28 and November 29, 1977 with computer run for work up to close-in of each unit
- Prepared interior network plans for A building, basement, first and second floors

B Building

As of January 6, 1978 (working day 259) pours B1 and B2 at the second floor are complete and forming is in work for the third floor first pour B3. B2 was poured out December 22, 1977 (working day 250) - its target date was November 29, 1977 (working day 233) which was a lag of 17 working days. Mr. Wirtz expects to pour out B3 at about January 27, 1978 (working day 274). It was due to be poured out no later than December 9, 1977 (working day 241) which gives a projected lag of 33 working days - a considerable increase in delay. The factors that have caused the delay are weather and difficult working conditions. We had considerable discussion as to whether the network should be revised at this point or left intact for the remaining pours - B3, B4, B5 and B6. For the time being we shall leave these as is since it is entirely possible some of the time can be picked up over the next few weeks.

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The critical element of the project is basically close-in of the buildings. The B unit is supposed to be closed ready for hanging drywall walls and ceilings by May 10, 1978 (working day 347). This is a key date and if it can be met, then the project will generally be in conformance to the targets set in our Issue #2 network. Dates for completion of the levels are as follows:

First floor B Building (B1)	-	August 21, 1978 (W/D 419)
Second floor B Building (B2)	-	September 11, 1978 (W/D 433)
Third Floor B Building (B3)	-	September 25, 1978 (W/D 443)

The above are early finish points except for B3 which has been made critical.

Discussions of the work progress generally indicate that although the project is not adhering right now to the expected progress rate that an improvement can be anticipated.

A source of concern presently is delivery of masonry units. Apparently there is still not full agreement on the brick and formal approvals are not yet available so that brick delivery can be specifically scheduled. This is serious since it is the intent to begin masonry no later than March 1, 1978 (working day 297). This is only 38 working days from the monitoring date and further delays will result if approvals are not cleared immediately. Generally it can be said that the entire project requires careful expediting attention from all parties - the owner, the architect/engineer and the contractors now - if we are to meet our total target completion dates.

A Building

Basement walls are poured to a point where forming for pour A1 has proceeded well. Mr. Wirtz expects to make his first pour January 11, 1978 (working day 262). The target for its early finish was December 15, 1977 (working day 245) and its late finish December 30, 1977 (working day 255). Thus, the lag is from 7 to 17 working days, probably trending toward the lower number. Target completions for the A building have not been totally established although preliminary indications are that it is going to be a tightly scheduled building. Close-in will be the main problem. It was decided at our session that we would use completion of insulation and roofing at the penthouse and at the main roof as our target close-in dates. Presently this is being held at September 22, 1978 (working day 441) although some improvement would be desirable.

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The diagramming session concentrated on preparing networks for interior work at the basement (AB), the first floor (A1) and the second floor (A2). We also had a rough logic plan prepared for the third floor (A3) but were not able to assign durations. Preliminary target completions show the following:

Basement (AB)	-	December 21, 1978 (W/D 504)
First Floor (A1)	-	January 23, 1979 (W/D 525)
Second Floor (A2)	-	February 15, 1979 (W/D 542)
Third Floor (A3)	-	probably about March 1, 1979 (W/D 552)

The Issue #4 networks, sheets 8, 9 and 10, were distributed to the various parties concerned and will be reviewed and evaluated to see where improvements can be made in the times required for the tasks. We will plan to discuss these at our next session and complete diagramming the A building.

Durations were taken from the sub-contractor data provided in October and could conceivably require some current review and updating to improve the times required for interior work.

General Summary

Overall the lag on the project ranges from a minimum of 7 at the A unit to 33 at the B unit in floor pours. Heavy winter weather has caused difficulties with both units but it was suggested by the project team that we maintain our current targets for another short period of time to see what kind of improvement can be made in recapturing the lag.

The project is nearly all diagrammed now with the exception of the third floor of the A unit. We shall plan to complete this at our next monitoring meeting. I shall be in touch with Mr. Robert Wilson to set this date shortly.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. R. D. Wilson (U of M Flint Campus)
Mr. Dick Sly, Sorensen Gross

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

March 11, 1978

Subject: Monitoring Report #5

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #2 dated October 28, 1977 and Issue #3 dated November 29, 1977

Date of Monitoring: March 8, 1978 (working day 302)

Start of construction: Mid-July 1977

Target completion date: February 15, 1979 (to be reviewed)

Actions taken:

- Inspected project
- Conferred with Mr. Paul Emery re job progress
- Reviewed job with owner, architect/engineer and contractor
- Updated floor pour and close-in networks to Issue #5 dated March 8, 1978
- Evaluated current project status

B Building

As of March 8, 1978 (working day 302) the second floor has been poured out (pour B2) and a third floor pour B3 will be ready for pouring on March 13, 1978 (working day 305). Mr. Emery expects to pour out B4, the second pour at the third floor, on March 29, 1978 (working day 317) and B5, the first floor at the roof, on April 6, 1978 (working day 323) with the last pour, B6, being made on April 21, 1978 (working day 334). Pour B6 was due to have been made no later than January 16, 1978 (working day 265). Thus, the lag on floor pours in the B building is at

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this time 69 working days, a considerable increase over the lag reported in Monitoring #4 of January 6, 1978 (working day 259). The basic reason has been the continual cold and inclement weather encountered during January and February. Thus, there has been very little work done in the B building on the structure since the previous monitoring.

As part of our evaluation we continued the construction sequence on out through close-in of the building and projected new completion dates for the B unit at January 4, 1979 (working day 512) as compared to an originally planned date of September 26, 1978 (working day 443).

A Building

In A building, the first pour, A1, has been completed and A2 is partially formed. Mr. Emery expects to pour A2 on April 5, 1978 (working day 322). Pour A3 will be made April 27, 1978 (working day 338) and pour A4 which is the first pour at the second floor is expected to be made yet this month. The reason the second floor pour will be done early is because it is the only upper pour located above a poured out floor.

At the A building severe soil and water problems were encountered during the late fall and nearly all winter in 1977. This caused problems which prevented slabs on grade from being constructed in appropriate and proper weather. Now these missing slabs on grade are causing delays at the deck since it is necessary to form off of the slab rather than to risk forming off of mud sills and having the sills settle as the base thaws as it is heated.

The current lag in the floor pours in the A building projecting on through to the last pour, A14, is about 56 working days. Our new updated network, Issue #5, dated March 8, 1978 shows the last pour being made on August 3, 1978 (working day 406) as compared to the Issue #2 network showing a pouring date of May 15, 1978 (working day 350).

A summary evaluation of the entire network shows that this 56 working day lag carried on through since in order to close in the building field measurements of the structure are necessary. Thus, the completion date for the A building now appears, using a 20 day floor turnover cycle for finished floors, to be about May 31, 1979 (616).

There is some chance that this schedule could be compressed but presently it is not apparent where it is to be accomplished.

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Another problem the project soon will be facing along with the entire Flint area is that contract expirations for nearly all construction trades begin May 1, 1978 (working day 340) and expire at staggered intervals throughout the summer. Indications presently are that there will be work stoppages this year although in what specific trades is impossible to determine. The UCEN project will be at a point where many affected trades will be working by that time and therefore, delays in any trade could have an effect upon the work. This has a double impact in that it delays work on the job relative to completion and conceivably could force the structure unclosed into another few cold winter months. Thus, it is imperative to do as much work now as is possible.

From our conference today it was apparent that all involved will make every effort to push the job as far along as possible in the next three months. These will be most critical and I suggest the heaviest attention be given to devising methods and ways by which the structural frame can be erected and the buildings closed in. Of absolutely critical importance is getting the structural frame poured out for both units so that field measurements needed for closing in on sash, curtain wall and every other element can be made and fabrication continued throughout the summer and the projected strike period.

General

The project basically due to extremely bad weather, poor soil conditions, delays in pouring out the slab on grade due to these soil conditions and other difficulties of a like nature has now dropped behind the current network by 56 - 69 working days. This lag, as discussed above, is serious and reflects itself almost directly in anticipated completion dates. I shall rough check the logic, the durations and the calculations once again to insure that such is the case. However, I will not issue a totally revised network at this time since there will be field changes that may affect such an updating. I will calculate the network manually and reissue it as Issue #5 dated March 8, 1978 to all concerned.

Meanwhile, I shall be in touch with Mr. Wilson regarding the next monitoring session.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. R. D. Wilson (U of M Flint Campus)
Mr. Dick Sly, Sorensen Gross

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

April 21, 1978

Subject: Monitoring Report #6

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #5 dated March 8, 1978

Date of Monitoring: April 17, 1978 (working day 330)

Start of construction: Mid-July 1977

Approximate contract target completion date: February 15, 1979 (W/D 542)
(This date to be reviewed)

Approximate target completion in Issue #5 - Early June 1979
(The report below measures against this date)

Actions taken:

- Inspected project
- Conferred with Mr. Paul Emery, Mr. Maury Montpas and Mr. Jim Tripp re job progress
- Evaluated current job status

B Building

As of April 17, 1978 (working day 330) five of six pours in the B building have been completed. The last pour at the roof will be made on April 21, 1978 (working day 334). This is in accordance with the target that had been established in our Issue #5 network dated March 8, 1978. Exterior masonry has started at the first floor of the B building. It was due to have begun on March 27, 1978 (working day 315). The actual starting date was about April 10, 1978 (working day 325) so the lag there is about 10 working days.

It appears we can hold a target completion of January 4, 1979 (working day 512) for the B building. This was the date set tentatively in the diagramming session on March 8, 1978 (working day 302) at which we updated the network to Issue #5.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

It should be noted that there is a distinct possibility of work stoppages in May and June due to trade strikes. However, at present there is little information available as to the probability of such work stoppages. Since there is a large number of contracts that do expire, it is reasonable to expect there will be, if not major, at least minor delays to field operations. For this reason we are holding issuance of the network model although it is ready to reissue as per our monitoring session on March 8, 1978 (working day 302). In the event work delays do not occur, we will then proceed to process the diagram in accordance with that session.

A Building

At the A building floor pours for supported decks are moving slowly because of their complex nature and the need to have space below available from which to construct. With the oncoming good weather it should be possible to develop a sequence at the A building that will allow better continuity of work. Presently it is expected to pour out A2 and A3 on April 28, 1978 (working day 339). This will complete the first floor supported deck.

The second floor has been broken into four pours - A4, A5, A6 and A7. One of the problems at this second floor is the fact that the section at the northeast corner over the kiva area is to be formed and poured only after the kiva floor slab is installed. This kiva slab has assumed an important position now and it would be wise to get it in work as rapidly as possible.

A full calculation of the network diagram with the logic developed on March 8, 1978 indicates completion will be somewhere between May 31, 1979 (working day 616) as reported in monitoring #5, and June 14, 1979 (working day 626). However, I shall hold off, as noted above, processing this network until better information is available relative to the strike potential that exists.

General

With the weather improving, the project is now showing signs of generating work continuity that could improve performance over the next few weeks. There still are problems with bulletins and revisions. In the B building particularly, it is important to clear Bulletin #3 which deals with hollow metal and the corridor wall. This matter has been addressed and authorization orally given to release the hollow metal frame revisions. Meanwhile, of course, every attention should be given to expediting processing long lead time items, particularly close-in items for the building. Getting the buildings in the dry will be most critical and it will be important to do so, of course, prior to the onset of difficult weather.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

In discussing the issue of the network with the owner's and contractor's staff, it was decided to hold off issuing the diagram until better data was obtained on potential work stoppages. Therefore, I shall report on the job against the network but we will not issue it for field use.

I have provided Mr. Sly with one copy of it and if any other copies are needed, they will be available. I shall be in touch with Mr. Montpas shortly regarding the next monitoring session.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. R. D. Wilson (U of M Flint Campus)
Mr. Dick Sly, Sorensen Gross

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

June 20, 1978

Subject: Monitoring Report #7

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #5 dated March 8, 1978 (working day 302) and Issue #6 dated June 14, 1978 (working day 371)

Date of Monitoring: June 14, 1978 (working day 371)

Start of construction: Mid-July 1977

Approximate contract target completion date: February 15, 1979 (working day 542)

Approximate target completion in Issue #6 - Mid to late May 1979 (The report below measures against this date)

Actions taken:

- Inspected project
- Conferred with Mr. Paul Emery, Mr. Maury Montpas and Mr. Jack Stevens re job progress
- Evaluated current job status
- Prepared update to Issue #6 dated June 14, 1978 (working day 371)

General

At this session we again reviewed the Issue #5 network dated March 18, 1978 and decided to update according to the latest data available. There still is a possibility of a teamster's strike within the next two weeks which could, under certain circumstances, cause a job stoppage. However, this is not likely. In July it is possible with expiration of the carpenter's contract that there could be a work stoppage. Presently it is not possible to evaluate whether this will occur or not. Therefore, it was decided to update the network utilizing the data available as of June 14, 1978 (working day 371).

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

A brief review of each building is given below.

B Building

As of June 14, 1978 (working day 371) as much of the structural system in B building as can be completed has been built and interior rough work is well along at all floors. Exterior masonry is substantially complete except for a small portion at the south.

There has been some improvement in delivery dates of curtain wall components and structural steel for the curtain wall has already been delivered and erected.

A review of projected deliveries now indicates that regular sash could be on the job within the next 20 working days and we are assuming it will be available by July 13, 1978 (working day 391). Mr. Emery reports that curtain wall glass and curtain wall aluminum are now expected to be on the job by October 2, 1978 (working day 447) which could bring total close-in of the building to about October 30, 1978 (working day 467).

Projecting further on a very rough basis into finish work at the floors indicates that probably the B building could be substantially complete by early January 1979.

It would be wise sometime soon to decide what to do in the event that the B building is completed earlier than a need for the building exists. This may not come to pass, however, in the event it does, a plan of occupancy or lockup should be formulated.

It should be remembered that the bridge from the B building to the existing classroom and office building should be installed this summer to minimize disruption at the stair tower on the north end of the existing building. The traffic pattern at this stair tower in September becomes quite intense due to the startup of school and it has been requested the bridge be built this summer.

A Building

Presently pours A1, A2, A3 and A4 are complete. Pours A5 through A13 will be completed on the following schedule -

A5	June 29, 1978 (working day 382)
A6	June 20, 1978 (working day 375)
A7	July 13, 1978 (working day 391)

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

A8	August 8, 1978 (working day 409)
A9	August 18, 1978 (working day 417)
A10	July 27, 1978 (working day 401)
A11	August 30, 1978 (working day 425)
A12	September 22, 1978 (working day 441)
A13	September 12, 1978 (working day 433)

Mr. Emery pointed out that this is an extremely tight schedule, however, he also said that every effort is now directed toward completing the structure within this time period.

It is expected that masonry at building A can begin within the next two weeks. The target for completion of all masonry on building A is about mid-October, after which insulation and roofing can be laid and exterior windows and entries installed. It is the goal to have roof insulation and roofing down by November 13, 1978 (working day 477).

Once curtain wall, glass and aluminum are delivered to the job site and all masonry is complete, it is expected that erection of the curtain wall should take about 30 working days which brings total close-in of the building to about November 28, 1978 (working day 487). This is a considerable improvement over recent previous dates and if it can be met, means that we probably will be able to complete the A building by mid or late May 1979. This would be a desirable situation and it appears feasible. I would like to reserve setting this date with our present networks until I have had an opportunity to recheck the calculations and make updated computer runs for Issue #6 dated June 14, 1978 (working day 371). I shall proceed to do this shortly but may hold off final running and issuing until the potential for a carpenter's strike is clarified. It was generally agreed this would be a wise course of action.

I shall make an effort to issue a manually computed network which can be distributed to those concerned. Meanwhile, Mr. Montpas has printed sheets 3 and 4 and given them to the key parties involved.

General Summary

Overall the project is smoothing out somewhat although there still are difficulties with pouring out the structure for building A. It appears the A building will be complete sometime in mid or late May 1979, with the B building complete by late December 1978 or early January 1979. I suggest the procedure for handling turnover of building B be discussed in some detail so in the event it is completed early, it is either utilized or is properly secured.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Again, it is also important to the university that the bridge to the existing classroom and office building be completed this summer and attention should be given this immediately.

I shall be in touch with Mr. Wilson shortly to set the next monitoring meeting.

Ralph J. Stephenson, P.E.

RJS
m

To: Mr. R. D. Wilson (U of M Flint Campus)

Mr. Dick Sly, Sorensen Gross

Mr. Jack Stephens, Tomblinson, Harburn, Yurk & Assoc.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

July 28, 1978

Subject: Monitoring Report #8

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #6 dated June 14, 1978

Date of Monitoring: July 20, 1978 (working day 396)

Start of construction: Mid-July 1977

Approximate contract target completion date: February 15, 1979 (working day 542)

Approximate target completion in Issue #6 - Mid to late May 1979
(The report below measures against this date)

Actions taken:

- Inspected project
- Conferred with Mr. Paul Emery and Mr. Maury Montpas re job progress
- Evaluated current job status

(Note: It was agreed to update Issue #6 as revised at our session on June 14, 1978 (working day 371)

General

As of July 20, 1978 (working day 396) most strike threats in building trades are past and apparently the carpenters have agreed to a settlement. Therefore, we will now draft and computerize Issue #6 dated June 14, 1978 (working day 371) and issue it for field use. In it we will identify the target end dates as agreed on in the diagram.

Overall, the project is maintaining fairly good conformance to the Issue #6 network. However, in building B the delay in obtaining roof coping has held installation of roofing although this should not be a serious deterrent to total building close-in.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Floor pours are moving well and being projected generally conforming to the target dates in Issue #6. Deliveries of aluminum curtainwall and curtainwall glass are still being held as noted on the Issue #6 network and no change is anticipated in the deliveries.

A brief review of each building is given below.

B Building

As of July 20, 1978 (working day 396) most above floor rough mechanical and electrical work has been installed on all three floors; a sizable percentage, probably as much as 90% of the interior masonry has been completed; additional work is now waiting on roofing of the project. Roofing is expected to be completed by the end of August or early September and this should allow us to maintain our current target dates for completion of the B building.

There is considerable pressure to turn over the B building early and it would be wise within the next two months to make a decision as to whether or not, if the building is complete by January, it will be occupied. This will, to some extent, affect sequencing of the interior trades.

Footings for the bridge to the classroom and office building are just getting underway and construction of the bridge will occur over the sumner period.

A Building

Presently pours A1, A2, A3, A4, A5, A6 and A7 are complete with the next pour to be made on A10 on schedule - July 26, 1978 (working day 400). Following floor pours have a moderately good chance of making their target floor pour dates as of now.

Interior rough work at the basement of the A building is moving well with sheet metal, piping, sprinkler piping and rough electrical work beginning at the lower level. Masonry work is well along at the basement of the A building. Exterior masonry started about a week ago at the A building and is expected to move in continuous fashion around the building.

We are expecting the target completion dates for each floor in the A building as recorded in Issue #6 dated June 14, 1978 can be held. We have not run a rough projection on these dates from the manually calculated diagram, but will do this now that the work can proceed with no foreseeable work stoppages.

General Summary

Overall, the project has moved fairly well over the past month and we now will issue the Issue #6 network for field use. I shall be in touch with Mr. Wilson shortly to set the next monitoring session.

Ralph J. Stephenson, P.E.

RJS/m

To: Messrs. Wilson, Sly, Stephens, Montpas, Tripp

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

April 28, 1978

Subject: Monitoring Report #9

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #6 dated June 14, 1978

Date of Monitoring: August 22, 1978 (working day 419)

Start of construction: Mid-July 1977

Approximate contract target completion date: February 15, 1979 (working day 542)

Approximate target completion shown in Issue #6 - Mid to late May 1979

(The report below measures against this date)

Actions taken:

- Inspected project
- Conferred with Mr. Richard Sly re job progress
- Evaluated current job status

General

As of August 22, 1978 (working day 419) pouring A building concrete has encountered serious problems. Pours 8 and 9 have been delayed since they were originally to be shored off the pool deck slab on grade and this was held pending a decision on a pool fountain. Therefore, the sequence was shifted and pours 10 and 11 were substituted for 8 and 9. Pour 10 was made about July 31, 1978 (working day 403), two days later than had been scheduled. Pour 11 is being formed and should be poured out within a few days.

The floor pours at the upper levels have been delayed by several problems including revisions and delays to delivery of resteel. However, these are gradually being worked out except that the delays have pushed the floor pour schedule back from Issue #6.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Presently it is not possible to make an accurate projection as to when the entire structure will be completed. The sequence of pours from now on will be 11 to 8 to 9 to 12 to 13. This is under review now and may change.

Floor pours are now becoming quite serious relative to the potential for delaying close-in of the A building and I strongly recommend that all potential revisions or other delay items be cleared immediately so the work can proceed while weather is still good.

At the B building interior rough work is in good condition and Mr. Sly reports that studs will probably begin sometime within the next week. The intent is to proceed through with the remaining rough trades at the floors and to start interior finish work just as soon as possible.

Curtain wall is presently due sometime in October. It was hoped recently that it could be on the job as early as October 2, 1978 (working day 447) but this may have to be revised to a slightly later date. Mechanical and electrical rough work is about 80% complete and should pose no major delay to interior trades. Therefore, closing in B building is absolutely essential. Roofing at B has been delayed by problems with shop drawings, roof pitches and roof insulation. These are now resolved and roofing probably will begin as soon as the materials are on the job. There is no current word on when this might be. However, again, if the building can be closed in at the walls, roof leakage should not pose major problems to early interior work.

Projecting with our present Issue #6 network, it appears that B building could be substantially completed by late December 1978. However, the potential for delay to exterior total closure is great enough so that I do not suggest this date be used as a target for any staggered occupancy. In addition, there is some concern about a major bulletin being prepared for issue. There was no authentic word on what areas it will affect but chances are that if it applies to building B, it will cause revisions to work already in place. Therefore, I suggest that we defer committing to any kind of target completion date explicitly for the B building.

At the A building, exterior masonry is moving well and has caught up in many cases with the structural frame. Again, as with B, A close-in will be extremely important, particularly that it be accomplished before the onset of cold weather. The Issue #6 network anticipated that A building would be closed in with curtain wall by November 28, 1978 (working day 487). If floor pours can be completed and the penthouse structural steel erected, followed by close-in of the penthouse, all concurrent with exterior masonry, according to our present plan of work, it is possible we can make this close-in date. Again, much will depend upon having curtain wall, sash and glass on the job when needed.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

In discussing current delivery problems with Mr. Sly, he said that they do not have approvals on brick pavers or slate. Pool ceramic was approved today, August 22, 1978 (working day 419). The pavers and slate are probably long lead time items and I recommend that these be selected and released just as quickly as possible. We have not planned the work at the pool in detail but as soon as the floor pour sequence is straightened around, it might be wise to replan and evaluate the method of constructing the pool interior. We shall review this in subsequent monitoring visits.

At the connecting bridge between the B unit and the existing classroom and office building, there have been problems with columns. Therefore, this structure has been delayed and there is no word on when it might be able to move ahead once again. The matter of structural sizes is being resolved.

I shall decide shortly as to whether it would be appropriate to issue the Issue #6 network dated June 14, 1978 or hold until later after current revisions have been issued. Much will depend upon progress on the job over the next two to four weeks. I shall plan to observe job progress on trips to Flint and will be in touch with Mr. Wilson shortly to set the next monitoring session.

Ralph J. Stephenson, P.E.

RJS
m

To: Messrs. Wilson, Sly, Stephens, Montpas, Tripp

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

October 31, 1978

Subject: Monitoring Report #10

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #6 dated June 14, 1978 (working day 371)

Date of monitoring: October 27, 1978 (working day 466)

Start of construction: Mid-July 1977

Approximate contract completion date: February 15, 1979 (working day 542)

Approximate field target completion shown in Issue #6 - Mid to late May 1979

(The report below measures against this date)

Actions taken:

- Inspected project
- Conferred with university, architect/engineer, contractor and subcontractor staffs re job progress
- Updated Issue #6 to reflect current field status
- Evaluated current job progress

General

As of October 27, 1978 (working day 466) two pours remain in the A building structure. These are expected to be completed by November 9, 1978 (working day 476). Meanwhile close-in of the buildings is proceeding and at the B building, roofing is complete and windows are being glazed. Mr. Sly reports that all windows and entries in B should be complete by December 22, 1978 (working day 505). B building curtain wall is just starting and should be complete by November 24, 1978 (working day 485).

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

All straight glass is on the site for A and B buildings. Sloped glass is expected on the job by mid-November. Penthouse structural steel is expected to begin about November 6, 1978 (working day 472) and will proceed on through close-in with a possibility of a slight delay due to the need to dismantle the tower crane to complete roof construction. The tower crane is to be dismantled starting November 27, 1978 (working day 486) and will take approximately 3 working days.

A building masonry is expected to be completed by December 26, 1978 (working day 506). Windows and entries are to start November 20, 1978 (working day 482) and be complete in about four weeks. Curtain wall and curtain wall glass for straight sections should be arriving on the job November 22, 1978 (working day 484) and will be substantially erected by January 2, 1979 (working day 510). Sloped glass will be delivered November 13, 1978 (working day 477) with sloped curtain wall on the job by December 22, 1978 (working day 505). Installation of the sloped curtain wall including glazing should be complete by February 12, 1979 (working day 539). Thus, the B building will be substantially closed to weather by mid-December, with the A building substantially closed to weather so interior finish work can start by late December or early January.

Using this as a basic premise, we re-evaluated interior finish work on both the B and A buildings. In making this evaluation, it was essential to differentiate between occupying the building as compared to having it operational. Some portions of the building will be available for occupancy earlier than others; however, because of operational needs for protection, alarms, heating, power and all systems elements the building generally will not be operational until total completion. This is particularly so since B building is partially dependent upon the A building penthouse for service facilities.

Therefore, our thrust in the updating session was to re-evaluate interior work at B and A. It has been decided definitely by the university that they want to occupy the B building as early as possible. The analysis below is based upon preliminary calculations with the rough network and upon best data available to date. Using this information, it appears that the B building third floor will probably be substantially complete in early February, the second floor in late February and the first floor in mid-March. Preliminary projections show that the penthouse at the A building could be operative by March 1, 1979 (working day 552). Thus, it was decided at this session that we would establish a target occupation and partial operational date of March 14, 1979 (working day 561) for the B building. I shall re-analyze the network and make whatever adjustments are necessary to reflect this target date.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

It is recommended that no major functions be scheduled for this date because there is in education facilities a considerable run-in period where the building must be moved into and made workable. Sometimes this is a difficult process and therefore, heavy dependencies upon perfect functioning of systems is not recommended.

At the A building, finish work could probably start at the basement by December 28, 1978 (working day 508). A preliminary evaluation of the A building shows that completion of the floors will be April 26, 1979 (working day 592) at the first and second floors, while the third floor will be completed by May 17, 1979 (working day 607). These again are tentative and will be subject to reconfirmation when the plan is totally updated.

It should be remembered that there will soon be strong needs for maintaining vigorous control over changes since these, at this point in the project, are very disruptive. There has been general agreement that the owner, the architect/engineer and all others connected with the program will make heavy efforts to minimize revisions to work. This has been stressed repeatedly in recent meetings and is an important ingredient to completing the project successfully.

As much site work is going to be done this year as possible, however, cold weather will soon close down site operations and thus, provisions will have to be made for safe and easy access to the building through areas already completed and available. This will be worked out by the university.

Within the above structure it appears we can still maintain our revised target completion of late May 1979, with a slightly later delivery of the B unit than earlier considered. Now that a decision has been made to occupy B early, definite direction can be given to the field operations.

It is important at an early point to insure that traffic from occupied areas through or to areas under construction be kept to an absolute minimum. Therefore, planning must be done now for the circulation patterns expected by the university and the contractors during and following move-in to the B unit. This must be worked out early if a successful partial occupancy is to occur.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Presently I am rechecking the network model agreed upon at this session, Issue #7, dated October 27, 1978 (working day 466) and shall use it as a base for monitoring the project from here on out. I shall be in touch with Mr. Wilson shortly to set the next monitoring session.

Ralph J. Stephenson, P.E.

RJS
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To: Mr. R. D. Wilson
Mr. Dick Sly
Mr. Jack Stephens
Mr. Jim Tripp

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

December 4, 1978

Subject: Monitoring Report #11

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #7 dated October 27, 1978

Date of Monitoring: November 27, 1978 (working day 486)

Start of construction: Mid-July 1977

Approximate contract completion date: February 15, 1979 (W/D 542)

Approximate field target completion shown in Issue #7 dated October 27, 1978 - May 17, 1979 (W/D 607)

(The report below measures against field target completion dates.)

Actions taken:

- Inspected project
- Conferred with general contractor representatives re job progress
- Evaluated current job status

General

As of November 27, 1978, all floor pours in the A building have been completed, masonry continues in the A building and a start has been made in installation and glazing of exterior windows. The major difficulties in the A building still revolve around the need to close in the facility to the weather so interior rough and finish work can proceed without weather delays. Emerging of critical importance is exterior masonry which is moving slowly, in part, due to the beginning of more difficult construction weather. However, it will be of major importance

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

that exterior masonry be completed and concurrently that the penthouse be closed in, roofing and insulation laid and the tower crane and interior scaffolding be cleared away as quickly as possible.

Presently much of the difficulty in making progress at the A building is caused by interferences with various temporary elements used in the construction process. It apparently is the intent to erect the vertical sash to allow the exterior of the building to be closed in on the glass side. This decision should be implemented promptly since in our updated network, Issue #7 of October 27, 1978 (working day 466) the straight curtain wall in building A was due to be completed and glazed by January 2, 1979 (working day 510). Sloped curtain wall and glazing are still due to be started in late December with installation complete by February 12, 1979 (working day 539).

At the B building exterior curtain wall is about ready for glass although it was not certain whether glass was on the job or not. Again, it will be important to close in the glass elevations at B so interior finish work can begin. There was some discussion about installing corridor interior walls as soon as possible to close in the interiors but apparently this is not being done as yet.

In the B building hanging of board has proceeded well at the first floor and is considerably ahead of early start/early finish targets set for that trade at the floor. It is just underway at the second floor and maintaining adherence to current targets. At the third floor board work has not yet begun because of difficulties in closing the building in. It should be pointed out that a decision was made and agreed to that the B building would be finished from the third floor on down to the first floor. Apparently this sequence has been temporarily reversed although I suggest if it is to be adhered to it immediately be regained in the field. Once a sequence begins with finish work it is generally difficult to reverse.

Overall, the lag in board work at the B building appears to be 5 to 10 working days. It is presumed at this time that all agree to maintain a target completion for the B building of March 14, 1979 (working day 561). However, it this target is to be met, it is imperative that better progress be shown on closing in and that the finish schedule from the third floor on down and out at the first floor be maintained.

At the A building close-in is an absolute necessity, particularly moving into the colder weather. In addition, it will soon be necessary to provide heat if progress on finish trades is to be maintained. These matters

RALPH J. STEPHENSON, P. E.
CONSULTING ENGINEER

should be worked out ahead of time so there is a minimum of delay in putting heat on the job as needed.

It was expected that the tower crane could be dismantled starting this week, however, due to interference difficulties, its dismantling will begin now December 4, 1978 (working day 491). It probably will take 3 to 5 working days to completely remove.

At the penthouse, structural steel is erected, exterior masonry is almost complete. However, metal deck is still not started and this is a concern. The deck is on the job and should be able to be placed and tacked down within the next few days. Closing in the penthouse would help greatly in making the building weather-tight. It also should allow installation of equipment at the penthouse to proceed.

I am assuming now that we will use as a standard of performance Issue #7, sheets 3 through 11 dated October 11, 1978 to measure current job progress. I have provided those concerned with copies of these documents and if there are any revisions or changes, it would be appreciated if they would be called to my attention. If this issue is satisfactory, I shall process it and issue it soon.

Meanwhile, it allows a convenient early start/early finish standard by which the project can be evaluated.

Ralph J. Stephenson, P. E.

RJS/m

To: Mr. R. D. Wilson
Mr. Dick Sly
Mr. Jack Stephens
Mr. Jim Tripp

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

January 8, 1979

Subject: Monitoring Report #12

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #7 dated October 27, 1978 (working day 466)

Date of Monitoring: January 4, 1979 (working day 512)

Start of construction: Mid-July 1977

Approximate contract original completion date: February 15, 1979 (W/D 542)

Approximate field target completion shown in Issue #7 dated October 27, 1978 - May 17, 1979 (W/D 607)

(The report below measures against field target completion dates.)

Actions taken:

- Inspected project
- Conferred with general contractor and owner's representatives re job progress
- Evaluated current job status

General

As of January 4, 1979 (working day 512) close-in of the buildings remains a prime target. At the B building most windows have been installed and glazed. However, curtain wall at the south elevation still must be completed. It could be closed by January 11, 1979 (working day 517) if the weather holds good.

At A building, installation of curtain wall is just getting underway and the contractor expects it to be completed by February 9, 1979 (working day 538). Pool curtain wall at A should start about January 26, 1979 (working day 528).

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

The above target dates appear to be very tight; however, it is absolutely essential to close in both buildings to continue substantial progress in finish trades sensitive to weather. All curtain wall material and glass are on the job and thus, the present major problem is installing them.

Another essential ingredient for close-in is roofing and completion of exterior masonry at the A building. Roofing will start shortly while masonry is in work and dependent upon weather, could be complete by January 12, 1979 (working day 518). These dates are very tight but we must assume they represent valid and desired goals.

Equally important is completion of enough mechanical equipment installation so heat can be fed to the two buildings. From discussions with the contractors it appears the basement equipment room at the A building is far enough along so when primary power is completed to the building (scheduled for Wednesday - January 10, 1979 - working day 516) the equipment will be ready to operate. Penthouse equipment is being installed but apparently is not needed for the initial provision of temporary/permanent heat.

We had considerable discussion about sequencing interior work on the project. In our October 18, 1978 (working day 459) updating the sequence selected was to work from 3 to 2 to 1 in the B building and from 1 to 2 to 3 in the A building. The A building basement was to float and be used as fill-in work. Now, however, the general contractor feels it might be more appropriate to go from 1 to 2 to 3 on interior work in the B building and 3 to 2 to 1 or concurrently in A building interior work. This matter is still in discussion and it appears that with the current status of work at the A building, at least, activities will have to be started on the floors as space becomes available.

It was stressed in our monitoring session by the general contractor that they are still maintaining a target completion date for the B building of March 14, 1979 (working day 561) and for the A building a target completion date of May 17, 1979 (working day 607). The earlier target completion for the B building does not allow for full occupancy and use of the building but only for a building in which equipment and materials could be placed and secured. Full use of the facility will not be possible until both A and B units are complete.

These completion targets include installation of carpet. There is some discussion as to how this is to be handled and the matter should be resolved as soon as possible.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

With the present lags on the project (ranging from 10 to 30 working days) it is imperative that the work pace be picked up immediately if target dates are to be achieved. Again, however, there is expressed confidence on the part of the contractors that with proper assistance and cooperation they can complete the job as anticipated. Our monitoring discussions also identified current delay potentials and methods of resolving these.

The food service equipment area on the third floor of the A building is a complex section of the building and it will be necessary to have equipment on the job soon to be able to install and hook it up. The general contractor said that some of the food service equipment is on hold, pending determination of utensil sizes and shapes. In conjunction with the owner, this matter was discussed in detail and it was decided that a special food service equipment meeting would be held Tuesday, January 9, 1979 (working day 515). This meeting should resolve all food problem areas so the entire kitchen equipment package can be totally released for full fabrication and delivery to the job site.

Another matter discussed was the ultimate release of Bulletin #8. This bulletin has been priced and is in the architect's hands for review. Apparently its major impact on work now will be electrical. However, all revisions should be cleared as soon as possible since the job is beginning to draw to a close.

Another important item is disposition of buying and installation of carpet. This matter is pending and requires attention on the part of both the contractor and the owner. It was agreed that several steps would be taken to resolve this matter and they will be put into work immediately.

Overall, the project requires heavy attention to close-in and a rapid solution of all pending matters that delay deliveries or installation. Concurrent, of course, will be the need to provide heat so all interior work can proceed once the building is closed in with no danger from damage by low temperature or external weather.

A brief review of the status of each major area is given below.

B Third Floor

Most metal studs have been erected and in-wall work is in progress. A very small amount of board (perhaps temporary) has been hung. The lag at three could range as high as 37 working days. This, however, is not necessarily the measure of lag at the building since the sequence of floor

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installation has been shifted from 3 down to 1 to 1 up to 3. Thus, the total lag at building B is probably closer to 15 to 25 working days.

B Second Floor

Most drywall has been hung at the second floor. However, no taping and sanding have started. The lag over the Issue #7 network is approximately 21 working days currently.

B First Floor

A good start has been obtained on hanging drywall and at present, work there is meeting targets between early and late starts and finishes with the exception of completion of metal stud erection. This work lags primarily because these studs are out under the curtain wall and work there is being held until curtain wall installation and glazing can be completed.

A Building Basement

It is expected that plastering could begin in the A building basement by January 29, 1979 (working day 529). This work was due to have begun no later than January 18, 1979 (working day 522). Thus, the projected lag is about 7 working days over a target completion of April 26, 1979 (working day 592). The lag is not yet overly serious, however, the work at the basement is considered fill-in work and thus, has a different relation to the total project than do the upper floors.

A Building First Floor

Work is still proceeding on above floor rough mechanical and electrical installation. Interior masonry is also in work. Drywall was due to begin on the first floor by January 3, 1979 (working day 511). It is expected now to begin drywall sometime in early February, probably by February 5, 1979 (working day 534). Thus, the projected lag there is approximately 23 working days. It is important to understand the intent of the contractor is to work all floors of the A building concurrently and to remove the present interrelations between these floors. Thus, it is possible that portions of the A building lag can be picked up by this revision to the sequence.

A Building Second Floor

Work is proceeding on above floor rough mechanical and electrical work. Board work here is expected to begin about February 13, 1979 (working day 540). It was due to begin no later than January 24, 1979 (working day 526). The projected lag is 14 working days.

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A Building Third Floor

Work is in progress on rough above floor mechanical and electrical work, as well as interior masonry. The projected lag at the third floor is difficult to identify since the intent, of course, is to begin work there as soon as possible. However, it should be remembered that third floor work includes installation of food service equipment and as has been noted above, this equipment is in partial hold pending determination of the china.

Probably the lag at the third floor is not as serious as at the first and second floors.

General

Overall, the project currently lags by 10 to 25 working days. If close-in can be expedited and interior work started and maintained concurrently at all areas of the project, it is possible that a good share of this lag could be picked up. In any event, it is the intent of the general contractor to meet the current target completion dates for both the A and B buildings. He considers this to be an essential goal and is pending every possible effort toward meeting them.

I distributed copies of the Issue #7 network to the contractor, the owner and the architect. This network has been calendar dated and it would be appreciated if all concerned would review it for content. It represents the agreed-upon sequence established when the Issue #7 network was prepared on October 27, 1978 (working day 466). I shall be in touch with Mr. Wilson shortly to set the next monitoring session.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. R. D. Wilson
Mr. Dick Sly
Mr. Jack Stephens

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March 15, 1979

Subject: Monitoring Report #13

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #7 dated October 27, 1978 (working day 446)

Date of Monitoring: March 12, 1979 (working day 559)

Start of construction: Mid-July 1977

Approximate contract original completion date: February 15, 1979 (working day 542)

Field target completion date shown in Issue #7 dated Oct. 27, 1978: May 17, 1979 (working day 607)

Note: The lags mentioned below are measured against the field target completion dates in the Issue #7 dated October 27, 1978

Actions taken:

- Inspected project
- Conferred with Mr. Sly and Mr. Irwin re job progress
- Evaluated current job status

General

As of March 12, 1979 (working day 559) the project is just being closed in with taping and sanding to start in the B unit on March 19, 1979 (working day 564).

In the A unit, finish trades, primarily plastering at the basement and drywall at the upper floors, will also be starting about March 19, 1979 (working day 564). We made a set of finish data projections based on

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these starting dates and using the logic of the network without inter-relating floors for each section of the building. A summary of these dates is given below.

Area	Project Start of Carpet	Projected Completion	
B-1	May 2, 1979 (W/D 596)	May 21, 1979 (W/D 609)	c/s
B-2	May 14, 1979 (W/D 604)	June 8, 1979 (W/D 622)	c/s
B-3	May 3, 1979 (W/D 597)	May 29, 1979 (W/D 614)	c/s
A Basement	No carpet	June 26, 1979 (W/D 634)	no
A-1	June 1, 1979 (W/D 617)	July 12, 1979 (W/D 645)	no
A-2	June 1, 1979 (W/D 617)	June 29, 1979 (W/D 637)	c/s
A-3	June 8, 1979 (W/D 622)	July 5, 1979 (W/D 640)	c/s

The above dates were projected from the Issue #7 network dated October 7, 1978 using the current logic and, as noted above, without identifying any major inter-restraints between floors. Mr. Sly reports work will be done independently on each floor so the trades will be working most floors concurrently.

Exterior close-in of the building is still experiencing some difficulty. Windows and entries at the A building will be completed about March 19, 1979 (working day 564). Most curtain wall and glazing at the B building is complete. The roof is on the penthouse of the A building and will be starting at the main roof of the A building shortly.

A brief review of each major area is given below.

B Third Floor

Most board is hung at the third floor and taping and sanding are expected to start March 13, 1979 (working day 560).

B Unit Second Floor

Board is hung at the second floor with taping to start March 15, 1979 (working day 562).

B Unit First Floor

Most board is complete and taping and sanding will begin March 19, 1979 (working day 564).

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A Building Basement

Overhead rough work is continuing. Mr. Sly reports that the heating system will be turned on about March 19, 1979 (working day 564). Plastering is expected to start about March 19, 1979 (working day 564).

A Building First Floor

Work on hanging board ceilings and walls is expected to start about Mar. 19, 1979 (working day 564).

A Building Second Floor

Work on drywall is expected to begin about March 26, 1979 (working day 569).

A Building Third Floor

Work on drywall is expected to begin about April 2, 1979 (working day 574).

It should be noted at the third floor that there is a sizable set of activities in setting food service equipment. Most of this equipment is on the job and available at the present time. It is expected that interior masonry will be complete in about 4 weeks - by April 16, 1979 (working day 584). Quarry tile will start April 16, 1979 (working day 584) and continue for about two weeks, finishing about April 30, 1979 (working day 594). At this time it should be possible to begin installation of food service equipment. It is projected that this equipment should be able to be completed by about June 5, 1979 (working day 619). Care should be exercised to insure that the food service equipment installation does not interfere with or cause delays to installation of other adjoining finish trades.

General

Overall, the project target completion now appears to be July 12, 1979 (working day 645). I shall plan to again review the job in the near future and will be in touch with Mr. Wilson and Mr. Sly regarding the next monitoring session.

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No updating of the network model was made at this session. It may be advisable to consider such revisions at our next monitoring.

Ralph J. Stephenson, P.E.

RJS
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To: Mr. R. D. Wilson
Mr. Dick Sly
Mr. Jack Stephens

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

June 19, 1979

Subject: Monitoring Report #14

University of Michigan Flint Campus

University Center (UCEN) Building

Flint, Michigan

Project: 77:55

Monitored from Issue #7 dated October 27, 1979 (working day 446)

Date of Monitoring: June 12, 1979 (working day 624)

Start of construction: Mid-July 1977

Approximate contract original completion date: February 15, 1979 (working day 542)

Field target completion date shown in Issue #7 dated November 27, 1978 (working day 446): May 17, 1979 (working day 607)

Actions taken:

- Inspected project
- Conferred with contractor, architect engineer, and owner representative re job progress
- Evaluated current job status

General

As of June 12, 1979 (working day 624) most exterior sash is complete. Curtain wall is substantially complete except for broken panes of glass which are currently being replaced. The building is in the dry except at areas adjoining leaking sash. Sealing of the curtain wall by the exterior batten strips is presently under way, and when this is complete, hopefully, areas presently subject to water damage will be closed.

In the A unit, efforts are still being made to finish down from the third floor and out of the building. At the third floor most rough work is complete and finish work is under way. The other floors are at substantially the same point in the A building except for the basement which is well along in finish work.

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At the B unit, finishing will also be from the third floor down to the first. A major problem has surfaced relative to installation of acoustic ceiling. The light fixtures for the non lay-in ceilings are apparently too large and will have to be replaced. This problem has just been identified and no current authentic information is available as to when the new light fixtures can be on the job.

Light fixtures must be available before the actual acoustic work can be installed. The ceiling support grid, however, can proceed without the fixtures.

In reevaluating the turnover schedule, the owner has indicated they wish to have the bookstore, the cafeteria, and all of the B building available for laying carpet by July 16, 1979 (working day 647). If this is to be met, then punching out the various spaces should begin the week before so a clear understanding is obtained of what the condition of the space is as of the start of carpet. Thus, proper assignment of responsibility for damage can be made if required.

In most of these early desired spaces there is the non lay-in grid ceiling and therefore, unless light fixtures arrive on the job almost immediately, the areas probably will not be completed by the above target.

The third and second floors of the A building are planned to be turned over for owner carpet installation by August 1, 1979 (working day 659). Remaining areas including the pool and site work are presently planned to be complete and available by August 15, 1979 (working day 669). The above is a desirable plan of work but it should be cautioned is very tight, particularly in light of the difficulties being encountered with ceiling installation.

At the cafeteria on the third floor of the A building, a large percentage of the quarry tile is installed and presently food service equipment is being set and hooked up. There are some field problems with the hoods but these will be resolved between the parties directly involved in the project.

In the basement of the A building, locker room work is moving fairly well with a good share of the ceramic tile already installed. Once the tile setter completes work at the locker rooms he will move up to the pool area and begin work there. This should be within the next 10 working days.

Installation of the ramp and bridge from the UCEN building to the classroom and office building is in work and hopefully will also be completed by August 15, 1979 (working day 669).

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In evaluating the job for the most critical areas that could cause completion difficulties, the first floor of the A unit offers the most potential for trouble. The finishes are difficult particularly the slate floors and the ceramic tile at the pool area. Therefore, care will have to be taken to insure that the traffic patterns through the first floor to the upper floors are controlled so no damage is incurred and no delay to the work is experienced.

General

Overall, the present target for turnover to the owner for installation of owner work will be between July 16, 1979 (working day 647) and August 15, 1979 (working day 669). There will be contractor work continuing on beyond these owner turnover points but it should be of such a nature that it can be accomplished with minimum interference with move in.

Ralph J. Stephenson, P.E.

RJS:sps

Original to Mr. R. D. Wilson
cc: Mr. Dick Sly