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RALPH J. STEPHENSON, P. E.
CONSULTING ENGINEER
March 12, 1982

Subject: Monitoring Report #1
Symphony Place Apartments
Minneapolis, Minnesota
Witcher Construction Company

Project: 82:08

Dates of Monitoring: February 24 and 25, 1982 (working days 38
and 39)

Actions taken:

- Reviewed early mobilization and start up activities
- Evaluated contract document issue needs
- Reviewed floor pour sequences
- Participated in start up planning session with Witcher staff, owner, architect/engineer, and major sub-contractors
- Evaluated current needs of project work

General Summary

At our previous session on January 11, 12, and 13, 1982 (working day 6, 7, and 8) a network model had been prepared containing information pertinent to the various floor pours for the entire building. In addition, an analysis had been made of contract document issue needs relative to starting foundation work for the project.

During this session we began to firm up these requirements resulting in information shown on sheets #1 and #2, Issue #2, dated February 25, 1982 (working day 39). It is the desire of the owner to begin active work on the job site by April 15, 1982 (working day 74). To do this, it will be necessary to have available contract documents sufficient to obtain foundation permits, to let foundation sub-contracts and prepare early shop drawings. The needs of this early package if we are to meet our target starting date indicate that foundation resteel will have to be on the job by May 13, 1982 (working day 94). This will require issuance of the sub-structure package (package A) by March 29, 1982 (working day 61).

If work is to continue on the job site, a further need will be felt almost immediately for the superstructure package (package B). Indications are that to meet the very tight procurement schedules that package B will probably have to be issued by April 12, 1982 (working day 71). These issue dates will have to be evaluated very carefully since the starting of this project must be timed so that flow of contract documents and the award of sub-contracts can be made in a manner not to interfere with on site job continuity. The entire process will require the highest level of cooperation and intermanagement between all offices, but most particularly between the owner, the general contractor, and the architect/engineer.

Although the sepia rough floor pour networks for the job are yet not complete I suggest that they be carefully reviewed, particularly sheets P-1, #1, and #2 which show early field work on the job. The content of the various contract document packages is outlined in the supplementary sorted information which was distributed at the owner, architect/engineer, contractor meeting which was held on February 25, 1982 (working day 39). This information contained a computer listing by contract document package of the various activities to be carried out relative to those contract document packages. I strongly recommend a careful study of this document be made to insure that the packaging proceeds in accordance with the actual job needs so work can proceed continuously without delays for correcting work already in place or in process of fabrication and delivery. This content factor is always of utmost importance in the staggered packaging and issue of contract documents to the field.

We are presently working on preliminary calculations for the various floor pours. It is the present intent to move up in the tower garage section (T pours) initially, followed closely by construction of the west unit pours (W) and the ramp area pours (R). Once tower construction gets to the plaza level the concrete work will then proceed on up to the top of the high rise units. We are checking these floor pour sequences and will establish in the very near future desired targets for these.

Meanwhile, I shall use the rough network models to make a preliminary floor pour analysis as we have discussed in our previous session. I recommend that at our next planning and monitoring session that we concentrate on firming up the floor pour sequences and also generate a close in network that will give us the dates by which we can begin interior finish trades at each level.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Mike Redmond

RALPH J. STEPHENSON, P. E.
CONSULTING ENGINEER

April 17, 1982

Subject: Monitoring Report #2
Symphony Place Apartments
Minneapolis, Minnesota
Witcher Construction Company

Project: 82:08

Dates of Monitoring: March 29 and 30, 1982 (working days 61 and 62)

Actions taken:

- Checked work plans to date for all floor pours
- Reviewed construction of foundations and early superstructure work
- Reviewed contract document needs of early field operations
- Completed planning all major supported deck floor pours
- Prepared network model for typical tower floor interior work
- Prepared partial close in diagrams for major portions of structure

General Summary

It is presently the intent to begin laying out the job, erecting barricades, and moving on the site May 17, 1982 (working day 96). Meanwhile, it is necessary to execute a contract for construction and to make ready to have sub-contractors on the job ready for start of mass excavation by June 1, 1982 (working day 106). It will be also necessary to consider the possibility of driving sheeting at the Northern States Power vault area. This work was not a part of the original scope of work and will have to be reviewed carefully since it probably will be necessary to complete the sheeting prior to the completion of wall and column footings.

Foundation construction will proceed on through excavating, backfilling, compaction, and construction of sub-structure concrete work up through to start of form work for pour T-1 which is the first pour to be made in the lower tower area. Form work for T-1 is expected to begin by

July 19, 1982 (working day 139). Form work for pour T-2 is planned to start by August 6, 1982 (working day 153). The T pours are the lower area pours in the tower up to the 8th floor and go from T-1 through T-12.

Once tower ramp pours are under way and when T-2 has been stripped and reshored, presently planned for an early finish of about August 25, 1982 (working day 166), forming for the 2nd floor supported deck at the north half of the west unit will begin. The pouring sequence there will continue up lagging the tower lower floors slightly. At the ramp area which is the portion of the garage not under the tower the first ramp slab at the south will start as soon as the T-3 or tower pour #3 has been made. This pour is presently scheduled for an early finish of August 31, 1982 (working day 170).

As with the west unit the ramp will be built following slightly behind the tower ramp area. The sequence requires that all three sections of the building - the tower ramp area, the west unit, and the ramp unit not under the tower - will be in construction concurrently. Careful management of floor pour work will be essential to insure that the pours are easily and economically stripped. Stripping ease is one of the major reasons for leading side area pours with the tower unit pours.

Once pour T-11 has been made at the tower ramp, construction of walls and columns to the bottom of the south 8th floor of the tower can begin. Present plans are to finish pouring T-11 at an early date of October 28, 1982 (working day 211). Tower pours will then proceed from south to north from 8th up through the roof in sequence. Weather has been allowed in the tower pours based upon its actual impact. Projections from the Issue #3 network model dated March 29, 1982 (working day 61) show the north roof pour, which is the last pour in the standard sequence, is to be made by June 3, 1983 (working day 363).

Close in of the west unit will start as soon as the south 5th floor (WS5) has been stripped and reshored. This is expected at an early date of November 3, 1982 (working day 215). At this time exterior stud walls at the 2nd floor including exterior board will begin. Concurrently but starting slightly earlier the interior perimeter west half masonry at the 2nd floor will also begin. This perimeter masonry separates the west unit from the parking areas.

At the tower unit exterior stud walls will also follow the pour sequences with exterior walls at the 8th floor beginning as soon as the 11th floor has been post tensioned,

stripped, and reshored. Studs are expected to start at the 8th floor beginning about December 29, 1982 (working day 253).

The sequence of erection for exterior tower walls is to begin with erection of the exterior stud walls followed by erection of masonry including support anchors. The current construction action plan anticipates using swing stages for masonry erection.

It is expected to have the building closed in at the lower tower area to weather at some intermediate point between the 8th and 26th floor. This point has not been decided upon yet, but should be set soon in order to be able to complete finish interior work within our present time constraints. Considerable discussion occurred at our meeting about the point where a temporary close in would best be made. It is generally felt that about March 7, 1983 (working day 300) would be an appropriate early analysis point although it might be necessary to bring about close in at an even earlier date to complete all work by our required target.

We are presently proceeding with the project based upon a later than anticipated starting date compared to our original planning. In the earlier planning we had assumed a start of construction on mass excavation on April 19, 1982 (working day 46). Present start of construction is 30 working days later on June 1, 1982 (working day 106). Thus, floor pours have been forced into more severe winter weather, and the intermediate close in point will have to be very carefully selected so as to proceed on interior finish work.

As part of our planning at this session we also prepared sheets T-1 and T-2, Issue #3, dated March 30, 1982 (working day 62) which gives a full network model for installation of all rough and finish interior work at a typical tower floor. It appears that from the start of interior work that requires full close in-probably when board is to begin and the fan coil units can be set in place- it will require about 50 working days minimum to complete the floor through clean up and move out. We made a turnover cycle analysis which is shown on sheet T-1, Issue #3, dated March 30, 1982 (working day 62) and this turnover analysis should be further refined prior to the start of actual work on the project. We will make this a part of our discussion at the next planning and monitoring meeting.

Overall, the project presently appears feasible; however, it is going to be absolutely essential that contract documents be issued promptly so that we can meet the

target needs for all work, but most particularly the early construction of sub and superstructure.

As a result of our planning at this session intensive discussions will be held with the architect/engineer to insure that the contract document packages A through I will be prepared as required. Probably the most critical of these packages is A, B, and C which are concerned with the substructure, superstructure, and close in and long lead interior items. It is the desire of the owner to issue as many of the documents as possible minimizing the staggering of them by issue. However, if a staggered issue is necessary to maintain continuity on the job and to insure meeting our target end date it will have to be requested and obtained.

At our next session I suggest we try to accomplish the following:

- A. Review the work now complete on sheets 1 through T-2 for agreement so far as sequence and durations are concerned.
- B. Establish definitive points in time where design information is needed from the architect/engineer.
- C. Identify all decisions which the owner must make that might affect work, particularly the early packages.
- D. Establish and confirm the long lead time equipment items that are to be ordered early and establish procedures for accomplishing this.
- E. Agree on length of time for submittal turnarounds and identify early submittal packages that will be given to the architect.
- F. Complete planning installation of exterior skin for the entire building.
- G. Begin detailed planning of the more complex interior finish areas particularly in the west unit.

I shall be in touch with Mr. Redmond shortly to set the next monitoring and planning session.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Mike Redmond

RALPH J. STEPHENSON, P. E.
CONSULTING ENGINEER

May 18, 1982

Subject: Monitoring Report #3
Symphony Place Apartments
Minneapolis, Minnesota
Witsher Construction Company

Project: 82.08

Dates of Monitoring: April 26 and 27, 1982 (working days 81 and 82)

Monitored from Issue #3, dated March 29, 1982 (working day 61)

Actions taken:

- Reviewed all floor pour diagrams
- Completed close in network models
- Reviewed schedule of long lead time procurement items
- Met with architect/engineer for review of contract document preparation

General Summary

We made a complete review of the sub-structure and superstructure networks based upon a starting date for mass excavation of June 1, 1982 (working day 106). It is expected to obtain a foundation permit by May 17, 1982 (working day 96) so as to be able to mobilize, move on the site, erect the necessary barricades, and lay out the job prior to the start of excavation on June 1, 1982 (working day 106). Presently it is anticipated that the construction contract will be executed by May 27, 1982 (working day 104).

As part of the early work it will be necessary for sheeting to be driven at the MSP vault area. This was not a part of the original scope of work and negotiations are now in progress as to how the vault will be built.

The plan of work for foundations shown on sheet #1 indicates we will be ready to form and set in floor work for the T-1 pour starting July 19, 1982 (working day 139). This is the initial deck pour on the project and is a critical date to meet. The various sections of the building have been identified on the K drawings and in previous reports. In summary, the floor pours are:

- Pours T-1 through T-12 - Tower parking areas
- W-2 through W-7 - Supported decks at west unit
- R-2 through R-7 - Ramp area supported decks
- N and S-8 through N and S-R - Tower supported deck pours through the roof

All diagrams for these pours have been completed and are presently being drafted into final form. Initial computations were made and these are being checked for incorporation into the issued networks. Presently it is the intent to complete drafting and dating with calendar dates and working days, the substructure and superstructure networks first followed by the close in diagrams and the interior rough and finish work items. All these diagrams are presently in work. A decision will be made on computerizing the networks once the initial issue has been made. It is possible that the computer work will be done in house at Witcher.

As we reviewed early field work we also made a detailed analysis of key owner decisions that will have to be made over the next few weeks. These were evaluated as to early, middle, and late stage project decisions. The list is shown on sheet P-1, Issue #4, dated April 26, 1982 (working day 81). These are duplicated below for reference and coded by early (E), middle (M), or late (L) decision point needs:

1. Brick selection (E)
2. NSP vault foundation work (E)
3. Carpet selection for early ordering (E)
4. Appliance selection (E)
5. Cabinet selection (E)
6. Light fixture selection (E)
7. Resolve plaza design and cost (E)
8. Construction of Minnegasco manhole (E)
9. Select all colors and materials (M)
10. Identify desired location of model apartment (M)
11. Release elevator cab design (M)

12. Select laundry equipment (watch rough in) (L)
13. Select signage (L)
14. Design and release landscaping (L)

Concurrently with identifying key owner decisions a list of long lead time items was also prepared along with the approximate times required from award of contract to delivery of the item to the job site. This analysis was made using submittal turnaround times which had been discussed previously with the owner and the design team. In this analysis it was assumed that from the time Witcher received submittals from their sub-contractors to the time when the sub-contractor would have the item back in their hands would be as follows:

Normal turnaround time - 26 working days

Expedited turnaround time - 17 working days

Super-expedited turnaround time - 8 working days

Components of the turnaround times is shown on sheet P-1 Issue #4, dated April 26, 1982 (working day 81).

Below is given an early list of the long lead time items to be covered under contract document issue H. Following the item is the number of working days estimated from award of contract to delivery of the item for the three turnaround situations identified above - normal (N), expedited (E), and super-expedited (SE):

<u>Long lead items</u>	<u>N</u>	<u>E</u>	<u>SE</u>
	<u>(in working days)</u>		
1. Chiller	128	119	110
2. Fire pumps	148	139	130
3. Pre-glazed windows	81	72	63
4. Switchgear	108	99	90
5. Emergency generators	128	119	110
6. Cable elevator	173	164	155
7. Cooling tower	88	79	70
8. Fan coil units	108	99	90

<u>Long lead items</u>	<u>N</u>	<u>E</u>	<u>SE</u>
	<u>(in working days)</u>		
9. Water heater			No information available
10. Air handling units			No information available
11. Fuel oil tanks			No information available
12. 200 amp bus duct			No information available
13. Meter centers			No information available
14. Transformers			No information available

The items for which information was not readily available will be checked and data obtained just as quickly as possible.

A major share of our diagramming work revolved around identification of when contract document needs would be most heavily felt in the early stages of the job. The present desired plan is to issue all substructure drawings by May 7, 1982 (working day 90) and all other drawings by May 27, 1982 (working day 104). This may prove to be very difficult since there is a sizable amount of work remaining on the design. These must be complete enough so early ordering and procurement can be done with a high degree of cost and scope certainty. Therefore, it was felt desirable to meet with the architect/engineer and review all early items that are critical to meaningful initiation of field work. We met on Tuesday morning, April 27, 1982 (working day 82).

At this session a full structural and architectural review was made and the needs of the project were outlined in detail to the design group. Of major importance is to insure that resteel and tendons for the early pours are on the job as needed with a minimal amount of delay due to fabrication difficulties. Therefore, discussions will be held on an ongoing basis with the structural engineer and the architect to insure that the accuracy needed in the early supported deck construction documents is achieved. Also, we reviewed mechanical and electrical equipment procurement, and as with architectural and structural every effort is to be made to get adequate documents for long lead time ordering at as early a point as is possible. It is desirable by those concerned that the drawings be issued as completely as possible by May 27, 1982 (working day 104).

After our review of work with the architect/engineer we continued planning the close in of the project and also began a detailed discussion of plaza level field work.

Since many decisions on design of this area are still pending, it was difficult to prepare a full network model for the work. However, we were able to complete our diagram as shown on sheet #12, Issue #4, dated April 27, 1982 (working day 82) up to start of interior painting. We have divided the areas at the plaza deck into a social area (SA), and an apartment area (AA). A strong need is to make certain we early identify and accommodate close in needs of the building since it may be desirable to provide a closed portion of the building as quickly as possible. Therefore, decisions at the plaza level that affect closing in the west unit must be resolved just as quickly as possible.

As part of the close in review we had a discussion in respect to location of the tower crane. The crane location will to some extent affect the close in schedule for plaza level work.

Resulting from our overall planning efforts was a set of rough network models which are now being drafted into final form. These will be issued as the various sectors are completed and will show the early and late starts and finishes in calendar and working day dates. We are assuming that the floor pours are all critical and that close in of the facility is also fully critical.

The target completion date is presently being held at December 1, 1983 (working day 489). Since it is a very tight date it is imperative that the entire program of design and construction be carefully and competently managed and monitored throughout particularly in the period between now and the onset of cold weather in 1982. It is absolutely essential that as much concrete work be done as possible prior to this period. Present desires are to have all floor pours in the tower garage area completed by early November, 1982; at the west area by early December, 1982; and at the ramp area by mid-February, 1983. It also is anticipated that we will have poured out the 11th floor of the tower unit by late December, 1982. Present plans are to continue concrete work through the winter and nominal amounts of weather have been allocated to the activities. The tight schedule makes it very important that all parties participate closely in the decision making and that any problems that arise be resolved as rapidly as possible.

I shall be in touch with Mr. Redmond shortly to set the next monitoring and planning meeting. At this session I suggest we concentrate on several items including:

1. Monitor and review status of contract document issue. Probably most of the documents will have been issued by our next session but progress should be measured.

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RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

2. Complete preparation of interior diagrams for the plaza area, lower apartment areas, and to as great an extent as possible, the commercial areas.
3. Decide on a method of processing the final network model.
4. Prepare a summary diagram of interior floor finishes in the tower for ease of monitoring.
5. Review again the procurement times allowed for each of the major items and complete preparation of procurement networks.

I shall try to have the initial issue of the structure network in final form for distribution at the next session.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Mike Redmond

RALPH J. STEPHENSON, P. E.
CONSULTING ENGINEER

July 23, 1982

Subject: Monitoring Report #4
Symphony Place Apartments
Minneapolis, Minnesota
Witcher Construction Company

Project: 82:08

Date of Monitoring: July 12, 1982 (working day 134)

Monitored from Issue #5, dated June 7, 1982 (working day 110)

Actions taken:

- Reviewed current job status
- Reviewed close in and interior finish network models with project staff
- Completed diagramming ramp area (R) pours at south
- Reviewed computer input process with Mr. Dave Thies
- Distributed network drawings #1 through #8 showing early starts and early finishes, Issue #5, dated June 7, 1982 (working day 110)

General Summary

The project has moved well over the past two weeks but is now encountering some early delivery problems and currently lags the Issue #5 network model dated June 7, 1982 (working day 110) by about five working days. Footings are well along and pit construction is in progress. It is hoped that some early compression of activity time might be made that will allow the project to regain alignment with the target dates for early floor pours. The tower ramp (T) portion of the project is to be built first followed closely after the T-2 pour is made by construction of the ramp north areas (RN) and west section (commercial area) of the project. If approvals are given promptly and the necessary drawings and deliveries can be obtained, recapturing of the lost time appears feasible.

It is important to get as far up on floor pours as possible by the onset of cold weather to provide more discretionary working room on close in and interior work.

We next reviewed the typical tower floor interior network and confirmed that the time required from the start of interior finish work (hanging board) on through to clean up and move out was approximately 50 working days. We also established that within the present constraints we are permitted no more than 8 working days as a turnover cycle for each floor (turnover cycle is the amount of time between completing one floor and completing the succeeding floor).

Further analysis of the close in diagram indicates that during the early floor work we may have to work two floors concurrently for the first six floors of work (8 through 14). It should be kept in mind that this work will probably be concurrent with similar activities at the west unit where finishing of apartments is also proceeding as the building is closed in.

This led us to a detailed discussion of the close in sequence. Close in of the project has been very difficult to plan because of the season of the year in which this work is proceeding. The later than desired start on the project has made it very difficult to obtain a totally favorable close in plan; therefore, we are presently working under the assumption that construction will have to proceed through the winter and that we will hold off on exterior masonry until the latest possible starting date. This sequencing is presently being reviewed by the Witcher project staff on an ongoing basis; however, we will complete drafting the close in network on the basis of our present decisions. A summary of the decisions is given below:

Fabrication and erection of exterior stud walls and sash will begin at the 8th floor as soon as the 11th floor of the tower has been post-tensioned, stripped, and reshored. This is expected to be by December 29, 1982 (working day 253). This work will proceed on up in the tower with preglazed sash being installed with the stud walls. It is anticipated that exterior masonry at the 8th floor could start as early as January 17, 1983 (working day 265). Exterior masonry at the 9th floor would have to wait on erection of the swing stage from the 13th floor and could begin as early as February 4, 1983 (working day 279). Using this starting date, subsequent erection of masonry would, for almost two months, be carried out in extremely bad weather.

The intent with masonry is to suspend swingstages at the 13th floor, erect masonry to the 13th floor and then shift the swingstage to the 18th floor. Masonry would be erected to the 18th floor and the scaffold would then be shifted to the 26th floor. This, of course requires that the floor pours be completed before the scaffold shift is made. There is a slight gap at the 17th to 18th floor sequencing due to a floor pour wait, but it was felt that the fewer scaffold moves was worth the slight delay.

Because of the cold weather problem a further analysis was made as to the implications of starting exterior masonry later, by March 15, 1983 (working day 306). This later starting date would still allow masonry to be completed well within the time constraints of the job. However, the later start does not afford all of the protection that is desired for beginning taping and sanding operations. Nevertheless, with the later masonry beginning, at most of the floors masonry is completed earlier than taping and sanding starts at that floor.

Analyzing start of hanging interior board it is seen that most of these dates are such that the exterior board, studs and sash at a floor are installed well ahead of the projected start of interior board with masonry protection also being afforded most of the floors in the upper areas.

Thus, at present it has been decided to move ahead with exterior studs, board, and sash starting at the earliest possible date probably about late December, 1982 or early January, 1983; to start exterior masonry about March 15, 1983 (working day 306); to start hanging interior board (start of the 50-day duration for interior work) on March 22, 1983 (working day 311); and to start taping and sanding at the 8th floor on April 1, 1983 (working day 319).

This gives the following key dates for tower floors from 8 through 26:

<u>Floor</u>	<u>Start Exterior Masonry</u>	<u>Start Interior Board</u>	<u>Complete Floor & Move Out</u>
8th	March 15, 1983 (working day 306)	March 22, 1983 (working day 311)	June 1, 1983 (working day 361)

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<u>Floor</u>	<u>Start Exterior Masonry</u>	<u>Start Interior Board</u>	<u>Complete Floor & Move Out</u>
9th	March 22, 1983 (working day 311)	March 28, 1983 (working day 315)	June 7, 1983 (working day 365)
10th	March 29, 1983 (working day 316)	April 1, 1983 (working day 319)	June 13, 1983 (working day 369)
11th	April 5, 1983 (working day 321)	April 7, 1983 (working day 323)	June 17, 1983 (working day 373)
12th	April 12, 1983 (working day 326)	April 19, 1983 (working day 331)	June 29, 1983 (working day 381)
13th	April 19, 1983 (working day 331).	April 20, 1983 (working day 332)	June 30, 1983 (working day 382)
14th	April 26, 1983 (working day 336).	May 2, 1983 (working day 340)	July 13, 1983 (working day 390)
15th	May 3, 1983 (working day 341).	May 12, 1983 (working day 348)	July 25, 1983 (working day 398)
16th	May 10, 1983 (working day 346).	May 24, 1983 (working day 356)	August 4, 1983 (working day 406)
17th	May 17, 1983 (working day 351).	June 6, 1983 (working day 364)	August 16, 1983 (working day 414)
18th	May 24, 1983 (working day 356).	June 16, 1983 (working day 372)	August 26, 1983 (working day 422)
19th	June 1, 1983 (working day 361).	June 28, 1983 (working day 380)	September 8, 1983 (working day 430)
20th	June 8, 1983 (working day 366)	July 11, 1983 (working day 388)	September 20, 1983 (working day 438)

<u>Floor</u>	<u>Start exterior Masonry</u>	<u>Start Interior Board</u>	<u>Complete Floor & Move Out</u>
21st	June 15, 1983 (working day 371)	July 21, 1983 (working day 396)	September 30, 1983 (working day 446)
22nd	June 22, 1983 (working day 376)	August 2, 1983 (working day 404)	October 12, 1983 (working day 454)
23rd	June 29, 1983 (working day 381)	August 12, 1983 (working day 412)	October 24, 1983 (working day 462)
24th	July 7, 1983 (working day 386)	August 24, 1983 (working day 420)	November 3, 1983 (working day 470)
25th	July 14, 1983 (working day 391)	September 6, 1983 (working day 428)	November 15, 1983 (working day 478)
26th	July 21, 1983 (working day 396)	September 16, 1983 (working day 436)	November 28, 1983 (working day 486)

It should be kept in mind that the above dates are being reviewed continuously, and that they represent late targets for the project. It is recognized by all concerned that starting the tasks at their late dates could result in undesirable buildup of manpower and reduction of the time bank for contingencies. However, the late start of the project in the field has forced us into bad weather periods for much of the close in work; therefore, the job will have to be planned carefully so as to minimize weather-related costs.

If earlier starts are possible on any of the above activities, particularly masonry, it certainly is the intent to begin when possible.

At the west unit, close in of the lower areas may be possible by early January, 1983 except for completion of insulation and roofing on plaza deck areas. This matter must be studied in more detail since the feasibility of laying insulation and roofing and having it remain intact while masonry is being erected above on the tower levels is a problem to be analyzed in more detail. We shall complete this analysis at our next planning session.

It was decided during our meeting that construction of the south half of the ramp area (RS) would start March 1, 1983 (working day 296). Thus, ramp areas will be built into halves to expedite field operations and hoisting.

To close out our session, I reviewed the computer processing for structural work on the job with Mr. Dave Thies who will see that it is properly inputted and run on the Witcher in-house data processing equipment. We went over sheets #1 through #8, and Mr. Thies will run these as soon as possible. If there are any questions, I have a duplicate set of prints and can resolve most minor difficulties by phone. At our next session we should plan to track the progress of this run and to add in the close in portion of the network followed shortly by the interior finish diagrams. At our next session I also recommend we concentrate on the following items:

1. Complete diagramming plaza level work.
2. Prepare a network model for the apartment floors of the west unit.
3. Complete diagramming all remaining work on the ramp area and on slabs on grade at all three areas.
4. Review procurement in detail. Procurement to date has proven to be possible but in some cases difficult due to the late issue of the contract documents. We must make certain that following procurement is given careful attention particularly on long lead time items which have been identified and are listed in Monitoring Report #3, pages 3 and 4.
5. Review the key decisions listed in Monitoring Report #3, on pages 2 and 3.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Mike Redmond

RALPH J. STEPHENSON, P. E.
CONSULTING ENGINEER

August 7, 1982

Subject: Supplement to Monitoring Report #4
Symphony Place Apartments
Minneapolis, Minnesota
Witcher Construction Company

Project: 82:08

Monitoring Report #4 listed the starts of exterior masonry for floors 8 through 26 in the tower. These starts were tabulated using a turnover cycle of 5 working days per floor and in the cycling did not take into account the needs for scaffolding moves. In checking through the close in network I found that although the floor 8 through 12 dates stayed the same as in Monitoring Report #4, that floors 13 through 17 were available each one day later than shown and from 18 through 26 the availability was from 8 to 10 working days later, due again to the need to move the scaffold.

Therefore, I have listed below a revised table for exterior masonry starts taking into account the scaffold moves. Please replace the information in your present Monitoring Report #4 with this new start date data.

<u>Floor</u>	<u>Start of Exterior Masonry</u>
8th	March 15, 1983 (working day 306)
9th	March 22, 1983 (working day 311)
10th	March 29, 1983 (working day 316)
11th	April 5, 1983 (working day 321)
12th	April 12, 1983 (working day 326)
13th	April 20, 1983 (working day 332)
14th	April 27, 1983 (working day 337)

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RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

<u>Floor</u>	<u>Start of Exterior Masonry</u>
15th	May 3, 1983 (working day 342)
16th	May 11, 1983 (working day 347)
17th	May 18, 1983 (working day 352)
18th	June 3, 1983 (working day 363)
19th	June 14, 1983 (working day 370)
20th	June 21, 1983 (working day 375)
21st	June 28, 1983 (working day 380)
22nd	July 6, 1983 (working day 385)
23rd	July 13, 1983 (working day 390)
24th	July 20, 1983 (working day 395)
25th	July 27, 1983 (working day 400)
26th	August 3, 1983 (working day 405)

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Mike Redmond

October 19, 1982

Subject: Monitoring Report #5
Symphony Place Apartments
Minneapolis, Minnesota
Witcher Construction Company

Project: 82:08

Date of Monitoring: October 13, 1982 (working day 200)

Monitored from Issue #7, dated August 9, 1982 (working day 154)

Actions taken:

- Inspected project
- Reviewed current job status with Mr. Dave Leier and Mr. Dennis Jakubic
- Evaluated current job status
- Reviewed monitoring procedures with Mr. Jakubic
- Briefly reviewed structure computer runs
- Color coded network models

General Summary

Work is proceeding well in tower units, fairly well in the west unit, and is lagging slightly in the ramp north unit. However, the work pattern appears to be leveling out and from discussions with the job management, pour sequences should continue to meet scheduled dates very closely.

The element which soon will be important in determining progress is weather. Therefore, every effort is being made to rapidly bring the structure up as high as possible before mid November, 1982.

Procurement is in fair to good condition, and Mr. Jakubic appears to have a good handle on the current status of submittals and fabrication. There are some potentially serious problems which will have to be given special attention. These include selection of brick mortar, selection of elevator cab colors, design of the elevator

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cab, and pool submittals and construction sequencing. Mr. Jakubic is following these items closely, and the present reporting and tracking system being used should keep potential trouble items visible.

A brief review of each major element of the project is given below:

Procurement

Mr. Jakubic and I used the checklist in Monitoring Report #3, dated May 18, 1982, pages 2, 3, and 4, as a base from which to evaluate current procurement. The order below is the same as that shown in Monitoring Report #3.

- Brick selection - Brick is made and is available. Mortar color must be selected.
- MSP vault work - In progress. Should be completed in 10 to 20 working days.
- Carpet selection - Not made. Selection will be available within 5 to 10 working days.
- Appliance selection - Not made. To be selected concurrently with carpet.
- Cabinets - Shop drawings are being prepared. Not yet submitted.
- Light fixtures - Shop drawings have been submitted and approved.
- Resolution of plaza design and cost - Complete.
- Construction of Minnegasco manhole - To be built in 1983.
- Selection of materials and colors - Being worked on at present. This activity should be followed carefully since it affects many items that could prove to be troublesome later procurement details.
- Location of model apartment - To be built on 8th floor. This apartment will serve as the standard-of-acceptance unit.
- Elevator cab design - Not completed. Need along with cab color selection.
- Laundry equipment - Not yet selected; however, rough in will be installed according to engineering drawings.

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- Signage - Shop drawings have been submitted for approval.
- Landscaping - No major work done on design and landscaping as yet. This is an \$8,000 allowance item.
- Chillers - Shop drawings have been approved. Chillers should be on the job in late January or early February, 1983. Will be set at the mechanical equipment room through the ramp slab area.
- Fire pumps - Shop drawings have been approved.
- Pre-glazed windows - Shop drawings are expected soon. West unit windows will be delivered in November, 1982.
- Switchgear - At the architect/engineer's for approval.
- emergency generators - At the architect/engineer's for approval.
- Cable elevator - Shop drawings have been approved and returned. Still need color and cab design.
- Cooling tower - Shop drawings in for approval.
- Fan coil units - Shop drawings have been approved.
- Water heater - Shop drawings in for approval.
- Air handling units - Shop drawings approved, fuel oil tanks available. Slab on grade will be built next year.
- 200 amp bus duct - Shop drawings in for approval.
- Meter centers - Shop drawings in for approval.
- Transformers - Shop drawings in for approval.
- Pool - No shop drawings received as yet. This item must be watched very carefully since it is a difficult specialty item. It involves unusual field fabrication work and probably will be a bulky operation that may have to be planned very carefully to conserve operating space. Mr. Jakubic is following closely.

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Overall, the procurement situation is under control, but as with any project of this nature, must be given continuous ongoing attention. Shop drawing logs are being kept and documentation of the work seems to be in good current condition.

Lower ramp (T)

Lower ramp pours are presently bettering early start/early finish dates. Pour T-10, the latest pour made, was completed the evening of October 7, 1982 (working day 197). It had a target completion of the evening of October 19, 1982 (working day 205). Thus, pours are about 8 working days ahead of the plan.

Forming is in progress on pour T-11, and it should be possible to maintain the ahead position for the remaining two T pours.

West unit (W)

Pours at the west unit got a slightly late start lagging the first target on the second floor by about four working days. The gap has been narrowing, and work is presently in progress at the 5th floor where the entire floor pour is anticipated to be made October 15, 1982 (working day 202). There is some question as to whether this can be accomplished but if it is made on working day 202 the lag will have been narrowed to about one working day. Thus, performance overall although tight has been good on the west unit.

It is expected to begin erection of the exterior studs, board, and masonry November 1, 1982 (working day 213). This is about one week later than had been anticipated in the work plan. Again, because of the nearness of winter weather it would be wise to get as much of this work done as early as possible. Thus, it becomes imperative that the mortar color be selected just as quickly as possible.

North ramp area (RN)

RN-2 and RN-3 have been poured and forming has started on RN-4. This work is currently lagging by about 12 working days. Although the lag will tend to push floor pours into more undesirable weather than had been planned, there is a possibility that some of the time can be picked up since the pours are relatively small and straightforward. In any event the lag does not pose any current major problems to the project.

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RALPH J. STEPHENSON, P.E., P.C.
CONSULTING ENGINEER

General

Overall, the current status of the work indicates that it will be possible to maintain adherence to the present work plan even though winter operations may prove more difficult than anticipated since planned weather allowances were kept to a minimum. However, if we are to complete by our target completion, it will be imperative that progress be maintained at as high a level as possible throughout the year.

At our session today we also reviewed remaining work to be diagrammed. Yet to be planned was interior finish work in the west unit floors 1 through 6. We prepared plans for the 3rd, 4th, and 5th floor apartment areas. These will be dated and issued soon.

Mr. Jakubic requested that we show the interior finish operations on a bar chart. I shall complete these also and send them to him as early as possible. Meanwhile, we also will reduce all network drawings to 11 x 17 for the use of those who prefer a smaller set of diagrams from which to work. We shall try to incorporate the bar chart forms in these reduced diagrams.

I shall be in touch with Mr. Jakubic and Mr. Redmond shortly to set the next monitoring and planning session.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Mike Redmond
cc: Mr. Dennis Jakubic

January 11, 1983

Subject: Monitoring Report #6
Symphony Place Apartments
Minneapolis, Minnesota
Witcher Construction Company

Project: 82:08

Date of Monitoring: January 5, 1983 (working day 257)

Monitored from Issue #7, dated August 9, 1982 (working day 154)

Actions taken:

- Inspected project
- Reviewed current job status with Mr. Dennis Jakubic and Mr. Dean Yerigan
- Evaluated current job status
- Rediagrammed pool roof to reflect change to concrete framing
- Reviewed and updated selected parts of network
- Reviewed procurement

General Summary

We inspected the project in the morning after a brief conversation with Mr. Dave Leier, superintendent, and were able to walk each floor up through the current deck being poured at the tower 13th floor. General progress on critical tower pours has been good with the current status of the decks being about five working days ahead of projected early starts/early finishes in the Issue #7 network model, dated August 9, 1982 (working day 154).

In the west unit all decks are poured, and the exterior skin along with interior rough work is under way.

On the parking ramp the north half has been poured out through the top deck with the south area presently being used for storage of equipment, hoisting, receiving, and general job servicing.

The pool roof has been revised to concrete and we evaluated this change and rediagrammed the construction sequence.

There is some current concern about the slow turnaround on some submittals, and Mr. Jakubic and I addressed this matter in detail.

So far as total close in of the building is concerned, there will be efforts made to expedite this activity to take advantage of the present ahead position in the tower. However, we will not make any major revisions to the current logic since it is difficult to anticipate what future weather impacts may be experienced this winter that will slow the project back to the current schedule. To date, most of our time gains on the project have come from working on through in the mild weather and recapturing most of the weather days built into the network model.

A brief review of each major area is given below:

Tower units

Today, January 5, 1983 (working day 257) the south 13th deck was being poured out, and it is expected that the north 13th deck will be poured out Friday, January 7, 1983 (working day 260). This puts the project four current working days ahead on the south half and a projected five working days ahead on the north half. Mr. Jakubic and Mr. Yerigan feel that the 14th floor decks will be poured out at the south on the evening of January 13, 1983 (working day 264) and on the north by the evening of January 14, 1983 (working day 265). This would put these decks at a projected ahead position of about 12 working days over the Issue #7 network model.

Again, it has been decided not to update the pour diagram due to the very real possibility of losing substantial amounts of time to weather in January and February, 1983.

Because of the current ahead position it has been also decided to consider erecting the masonry swing stage supports from the 16th floor instead of the 14th floor. This should allow the supports to be moved directly from the 16th floor to the roof in one jump rather than possibly having to consider two distinct moves of the swing stage and the resulting interruptions.

In addition, it would be appropriate to again re-examine starting dates for tower masonry. The mild winter to date has lead to speculation that it might be possible to

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begin masonry at the 8th floor sometime earlier than the presently projected date of March 15, 1983 (working day 306). Mr. Jakubic, Mr. Yerigan, and Mr. Redmond will again review this matter in depth at an early date.

There is concern that the exterior stud and board wall will not be sufficient to keep the building dry against rain for start of taping and sanding interior finish drywall. Again, this matter will be reviewed shortly in detail. Present plans are still to start the interior finish work at the 8th floor with hanging, taping, and sanding board to begin no later than March 22, 1983 (working day 311). It should be noted that the first few upper tower floors, 8 through 13, had been planned anticipating concurrent work on multiple floors. This is to insure that when we start the 8-day turnover cycle per floor from the 13th to the 14th and continue it on up that we will meet our current target project end date of the evening of November 25, 1983 (working day 486).

In our updating discussion it was decided that we should show the late starts and late finishes on the tower interior floors as well as on all other interior finish floors. We shall use the end of clean up and move out as a critical date for each floor and calculate late finishes and late starts from it.

West unit

The west unit is poured out through the 6th floor, and the 7th level deck is formed with some resteel set. This deck has been on hold since early December, 1982 since it was necessary to redesign the pool roof deck. As part of our work today, we rediagrammed this change and tied it in to the plaza deck social area network on sheet #12. The revision will be incorporated into a revised drawing and reissued shortly.

Present plans are to complete pouring out W-7 by the evening of January 12, 1983 (working day 263) and after curing, post-tensioning, stripping, and reshoring to begin work on the pool roof. The pool support structure and liner will be set after the pool roof is totally cured and stripped and before the sliding doors and the curtain wall are installed at the plaza level.

Current work at the west unit is being concentrated upon closing in and erecting interior studs and in wall work. The lag on close in of the west unit over early starts and early finishes is currently about 20 working days.

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At the 2nd floor there are no studs erected as yet but overhead plumbing and electrical work is well along. At the 3rd floor rough plumbing and stud work has been moving well and is currently lagging early starts and early finishes but within target ranges on late starts and late finishes. At the fourth floor, rough interior work and studs are also moving well and although they lag early starts and early finishes are well within target late starts and late finish dates. Work at the 5th floor is presently being concentrated on rough work and installation of studs.

Overall, the west unit appears to be in reasonably good condition; however, it is extremely important that the pool roof matter be resolved as quickly as possible and that close in of the west unit be allowed to proceed without any further delay.

Parking ramp

The north parking ramp has been poured out through the top deck, and is now being used for access and storage. Work on the south ramp will begin about March 1, 1983 (working day 296). No major problems are currently anticipated in completing the south ramp.

Procurement

There has been some difficulty with slow turnarounds on shop drawings, and Mr. Jakubic has written to Mr. Chance of Winsor/Paricy, the architect/engineer, regarding this. We made a detailed evaluation of each pending approval and identified seven elements that are particularly important to maintaining continuity and ongoing progress in the field. These are reviewed below:

- Rubbish chute - The rubbish chute shop drawings, according to Mr. Jakubic, were submitted on October 9, 1982 (working day 204) and have not yet been returned. The rubbish chute is to be installed in a relatively small room at each floor and access could prove to be difficult if it is not possible to set the chute as stud walls are erected on each floor. Thus, an early approval is desired so material can be brought to the job site and be available as the partitions are erected on the floors.
- Swimming pool and whirlpool structural framing - This framing is for the support structure on each of these items and was submitted on November 19, 1982 (working day 226). It is important to obtain these back since present plans are to erect the pool structure about March 3, 1983 (working day 298).

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- Postal specialties - This item is the mail box and accessories at the plaza level. Shop drawings were submitted November 5, 1982 (working day 217) and have not yet been returned. The mail box is normally a long lead time delivery. Present plans are to frame and set the box along with the stud walls. This work is planned for early April, 1983. Because of the long lead times sometimes encountered it is desired to return the shop drawings to the supplier as early as feasible so that the equipment will be on the job when the walls are erected.
- Sprinkler layouts - These were submitted on October 27, 1982 (working day 210) and have not yet been returned. Some sprinkler piping is already being installed. However, because stud walls are now being erected in several areas it is becoming essential that this installation proceed along with stud wall installation, and with fully approved shop drawings. There is a great need for sprinkler layouts, and the drawings must be reviewed and approved and returned just as quickly as possible.
- The approximate 27 hollow metal frames and finish hardware items on hold were submitted in late August, 1982 and on September 15, 1982 (working day 180). Certain of these items are needed to be installed along with stud walls and since stud walls are already starting up the frames should be available as needed. There usually is a fairly long lead time for delivery of such frames and thus early approval is essential.
- Aluminum windows, entrances, and metal panels - These shop drawings were submitted on December 3, 1982 (working day 236) and are not yet back. Some windows are already being installed but chances are that fabrication of additional windows, particularly those to be installed in the tower, will be delayed until approved submittals are back in the supplier's hands. Since stud walls, sash, and glazing are to start in the tower soon this becomes a very critical approval to receive from the architect/engineer.
- Flashing and sheet metal - Shop drawings for these items were submitted in early November and December 15, 1982 (working day 244). The flashing and sheet metal, in some cases restrains masonry from being erected. Since favorable weather has

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RALPH J. STEPHENSON, P.E., P.C.
CONSULTING ENGINEER

allowed masonry to proceed, it is desired to have all flashings and sheet metal on the job and available as needed.

The above is a review of the most critical of the items identified in Mr. Jakubic's letter to Mr. Chance. I suggest that this matter be discussed in depth at the next construction meeting or earlier and a resolution be made of the problem. Procurement will be an increasingly important part of the total project since there are currently only 229 working days to turnover of the total project. This is not a long period of time.

General

Overall, the project is currently moving fairly well although progress in the west unit has been slowed considerably by revisions to 7th floor roof framing and subsequent delays to closing in the structure.

Lower floor pours are moving well, and close in work should be able to proceed on up shortly.

Procurement, as noted above, will be an increasingly important item and must be followed cooperatively and jointly by the contractors and the architect/engineer so as to minimize delays encountered by problems with approvals, fabrication, and delivery.

I shall be in touch with Mr. Jakubic and Mr. Redmond shortly to set the next monitoring session. Meanwhile, I shall revise the network model as discussed above and in our meetings and reissue.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Mike Redmond

cc: Mr. Dennis Jakubic