RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

May 31, 1978

Subject: Monitoring Report #1

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Mpls. - General Contractors

Project: 78:37

Date of Monitoring: May 22, 1978 (working day 100)

Monitored from Issue #1 dated May 22, 1978

Ground breaking - set for June 19, 1978 (working day 119)

Actions taken:

- Prepared summary network model for substructure work
- Set early front end activities

General Summary

At this preliminary planning session we prepared a summary network diagram of early front end work (proposals, contract awards, shop drawing submittals, approvals and deliveries) (F) and of the substructure work for the garage (G), and tower (T). The network model is to furnish a preliminary framework within which further discussions of the construction process can proceed.

Mr. Maertens said that contract documents (CD) will be issued and proposed upon as they are made available. The following tentative schedule has been set:

- Issue excavation CD's - by May 24, 1978 (working day 102)
- Issue resteel and precast CD's to grade (for early materials and unit pricing) - by June 6, 1978 (working day 110)
- Issue sub-grade concrete specifications - by June 7, 1978 (working day 111)

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- Issue tower substructure contract documents - assumed by July 17, 1978 (working day 138) (Note: This is to be checked)
- Issue tower superstructure contract documents - no date set
- Issue mechanical and electrical contract documents - no date set

Note: All the above must be reviewed and confirmed or revised as needed by the architect/engineer.

It is the intent to mobilize for work so that by June 19, 1978 (working day 119) a ground breaking can occur after which mass excavation will proceed at the garage area and proceed on across the entire site, followed by construction of the garage and tower substructure wall footings, walls, precast and cast in place supported decks.

The network model, Issue #1, sheets 1 and 2, dated May 22, 1978 shows early front end work (F) for excavation, resteel, precast, sidewalk permits, concrete mix approvals and sub-grade concrete work. It is intended that construction of footings will be followed closely by walls, with exterior and interior walls being erected to reasonable completion at the garage after which installation of precast columns and beams will begin. Meanwhile, maintaining access, construction of the substructure at the tower will proceed and when substantially complete, be followed by erection of precast elements.

Cast in place ramps and slabs will probably be built once precast has been erected.

Key dates anticipated in the Issue #1 network, sheets 1 and 2, are as follows:

- Start mass excavation - June 19, 1978 (W/D 119)
- Start garage wall footings - July 24, 1978 (W/D 143)
- Start garage walls - July 31, 1978 (W/D 148)
- Start tower wall and column footings - October 4, 1978 (W/D 194)
- Start tower substructure walls - October 18, 1978 (W/D 204)
- Start garage precast - September 5, 1978 (W/D 173)
- Start tower precast - November 30, 1978 (W/D 234)
- Complete garage area ramps - October 26, 1978 (W/D 210)
- Complete truck entry ramps - February 5, 1979 (W/D 279)

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The above dates are early starts and finishes and in some cases there may be slight amounts of float time available. It is to be emphasized that these are preliminary in nature and subject to confirmation as front end work and early field work proceed.

It is the intent, as design and contract document preparation continues that design development estimates will be prepared and submitted. A schedule for these has been set by Mr. Maertens.

I suggest the project be planned very carefully and that it be monitored on a regular basis since it is an extremely complex building and will require careful control and scheduling to bring it to a successful completion.

I shall plan to work on the project as required on my visits to the Kraus-Anderson office.

Ralph J. Stephenson, P.E.

RJS
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To: Mr. Joe Maertens
Mr. Dean Winquist
Mr. Dave Thies
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER
July 9, 1978

Subject: Monitoring Report #2

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Mpls. - General Contractors

Project: 78:37

Date of Monitoring: June 28, 1978 (working day 126)

Monitored from Issue #2 dated June 28, 1978 (working day 126)

Approximate start of field construction: June 19, 1978 (working day 119)

Actions taken:

- Continued preparation of network models for front end work and below grade construction operations

General Summary

This monitoring and diagramming session was held at the office of Minoru Yamasaki and Associates and was participated in by the owner, the architect/engineer and the general contractor. At the meeting we made a complete review of earlier diagramming efforts and decided to rediagram early work with all parties concerned to be certain of the validity of the effort.

Field work is presently underway with the groundbreaking ceremonies and start of construction occurring just recently. Major efforts now will be made to maintain construction operations on an ongoing basis so that dove-tailing of design and construction will be effectively implemented.

We broke the design work into packages that appeared to be acceptable to those present at the conference. The packages described below consist of contract documents (CD's) containing approximately the scope of work defined.

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Package #1	-	Mass excavation CD's	-	issued
Package #2	-	Garage structural CD's	-	to be issued July 5, 1978 (working day 130)
Package #3	-	Includes the following CD's - tower basement structural - tunnel - garage and tower basement architectural, mechanical and electrical including sleeve sizes and locations - all information about below grade slabs on grade and underground utility work - foundations for reshoring tower trusses	-	These are to be issued October 3, 1978 (working day 193)
Package #4	-	Elevator CD's	-	to be issued November 1, 1978 (working day 214)
Package #5	-	Tower base building CD's includes: - structure - exterior skin - all mechanical - all electrical - all base building work	-	to be issued January 2, 1979 (working day 255)
Package #6	-	Tower special building work CD's (to be defined)		to be issued April 2, 1979 (working day 319)

It is recognized that the scope for each of these packages is still being defined and subject to change. However, the above has been agreed upon as a rough outline for providing guides to when various working documents can be expected.

A very critical element of our discussion revolved around the issuance of Package #3. It was requested by the general contractor that they be

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permitted to proceed with reinforcing steel detailing, submissions and conditional reviews and approval prior to formal issue of the package so as to be able to get tower basement structural work into the field at an early date. This is a critical portion of the project and if the major share of the detailing, submissions, review and approvals along with some fabrication can be done early with revisions then being made as necessary when the package is issued, it would help expedite this portion of the project.

The matter is under review now by all concerned and will be discussed in more depth at subsequent meetings. Presently it appears this might be a feasible course of action.

We also discussed in detail the turn-around times for various shop drawings and it was decided that for the conventional submissions and approvals handled directly by the architect/engineer 27 working days would suffice from receipt of the shop drawings at the general contractor's office to his return of them to his subcontractor. For structural drawings, this time is slightly longer, 31 working days. The flow of shop drawings was reviewed by those at the meeting and agreed to.

Front end work on projects of this type becomes very important since it normally consumes much more time than anticipated especially with very difficult mailing delays being encountered during recent years. Therefore, it becomes of importance to pay careful attention to expediting all front end work wherever possible.

After detailing the various packages and how they would be issued and discussing the early submissions and approvals, we next talked about how the project would proceed in the field. It is the intent to construct the garage portion of the building up to grade and concurrently, as information becomes available, to move into the tower basement and bring it up to grade also. The revised logic devised at this session is shown on sheets F1 and 1, Issue #1 dated June 28, 1978 (working day 126). Copies of this network diagram have been distributed to all concerned and are presently under study for possible improvements.

At our next session we hope to proceed with additional planning at the tower structure and to bring the logic plan on up through close-in of the tower superstructure. This meeting is currently set for July 10, 1978 (working day 133) at the Kraus-Anderson office in Minneapolis. I shall check with Mr. Maertens regarding details of the session.

Ralph J. Stephenson, P.E.

RJS/m

To: Messrs. Maertens, Winquist, Svee, Walgenbach

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

April 18, 1979

Subject: Monitoring Report #3

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Mpls. - General Contractors

Project: 78:37

Date of Monitoring: April 18, 1979 (working day 331)

Monitoring from Issue #9 dated March 30, 1979

Approximate start of field construction: June 19, 1978 (working day 119)

Approximate target date for completion: September 3, 1980 (working day 682)

(Note this is the target date shown in the issue #9 network dated March 30, 1979)

Actions taken

- Inspected project
- Reviewed current job status with Mr. Willam, Mr. Gary Evee and Mr. Bruce McQuade
- Evaluated current job status

General Summary

The project plan now being used is issue #9 dated March 30, 1979 (working day 318) sheets 1 through 31. These are the results of the network modelling done by the project team with Bruce McQuade and myself over the past several weeks. The current model has been agreed to by those concerned and is now being used as the standard of performance. At this monitoring we inspected the job and reviewed the position of the field work with respect to the network diagram.

Presently slip forming is just starting and the first form move was made beginning about 1:00 p.m. April 18, 1979 (working day 331). The target for start of slipping was April 16, 1979 (working day 329). Therefore there is currently a lag of 2 working days which probably if the slip moves well will be picked up rapidly.

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Outside the core, work on basement decks is proceeding with the first pour (pour B 1) to be made on April 27, 1979 (working day 338). This pour was due for a late pouring start of April 17, 1978 (working day 330) and so lags by a projected 8 working days. However, Mr. Willam says that the second pour (B 2) will probably be made May 1, 1979 (working day 340). It had a late start date of May 2, 1979 (working day 341) so we have at that point regained the lag. However, it will be necessary to continue on a very close and tight turnover basis in order to maintain expected progress of deck construction.

The early pours are of importance because of the fact that they will allow construction of the southwest, northwest, southeast and northeast corner columns to be carried up to the plaza level ready for the plaza forming and pouring operation. From there the columns are carried on up to the plaza and to the storage level.

These are very important operations and to accomplish them properly the decks must be kept in tight alignment with the network model dates.

Work on the large girder at the storage level is beginning with the erection of the west girder bottom along with the bottoms for girders A and B which are the west side girders running east and west. This work was due to have begun no later than April 5, 1979 (working day 322) and thus lags by 5 to 8 working days. Work on the beam bottoms is important in that it allows the storage level pre-cast tees and girders to be set and the remainder of the girders to be formed and poured.

The present goal is to construct the storage level pre-cast tees and girders at the west (girder W) as soon as the slip has moved to the 7th floor which should be by May 10, 1979 (working day 347).

Girders are to be built in a sequence generally from west to south to north to east, finishing up at the east half of the north girder. There is considerable over lapping, but overall the actual beginning of work is with the start of the erection of the pre-cast tees and girders at W which is due to begin May 10, 1979 (working day 347).

This points up the importance of continuous expediting of pre-cast materials since they will be essential elements of ongoing work on the large girders.

The last pour on the large girders is due to be made no later than July 17, 1979 (working day 393).

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Another activity of concern is continuous attention and follow-up on front end items and deliveries. The site is crowded and therefore scheduling of items onto the site and into their position in the building will be of prime importance.

I would also like to again emphasis the desirability of thinking of the core as a separate building which once closed to weather at the top might be worked floor to floor with both interior rough and finish trades. The core area is the major time consuming operation in installation of interior work and yet it is due to be stripped out and completed by June 26, 1979 (working day 379). Thus if it were desired and possible, major work could be going on at each floor level in the core completely independent of the work that will be put into the outer perimeters of the floors. It is entirely possible that using this technique, could save a considerable amount of time on total overall project installation.

Also of importance is to give careful and immediate attention to delivery and installation of elevators. This too is an operation that could be carried out at the core somewhat independently of construction in outside portions of the building.

The mechanical equipment rooms at the floors are in the cores and probably it would be desirable to set equipment and begin its installation as early as possible so as to have easy access into the area. Toilet rooms and stairwells also are elements of the core that would be wise to focus on at an early date.

We have talked briefly about this approach and it is presently the intent of the field management to review the idea for feasibility as the project goes up. However, since we are now actively engaged in slipping the core it would be good to concentrate heavy attention on this method of procedure. I have spoken about the sequence with the project team briefly and it would be in my opinion well worth pursuing further.

Most of the major work has now been planned and put on final draft sheets by Mr. McQuade. There still remain a few areas that must be completed. These include interior finish work for the lower parking levels, lobby and plaza level, interior work at the cafeteria, whatever minor finish work that must be done at the storage level, and completion of interior finish work in the tunnel.

Another item that might be desirable to review in more detail is installation of elevators. These will be a vital part of the vertical transportation process.

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CONSULTING ENGINEER

I also recommend that the hoisting required and available on the job be again reviewed to insure there is enough capacity to handle all the work needed without delay. The key to success on this project will be the field force's ability to hoist and set material and equipment in place with a minimum of handling time. The effectiveness of hoisting equipment is of course directly related to its placement and capacity.

I would like to recommend that this project be regularly monitored since a network model of the standard of performance is now available that has been calculated with early and late starts and finishes. Regular monitoring on a project of this type is essential to measuring accurately and rapidly deviations from expected performance and making the necessary corrections.

Ralph J. Stephenson, P.E.

RJS:cmz

To: Mr. Bruce McQuade
Mr. Dean Winquist
Mr. Carl Freij
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

May 16, 1979

Subject: Monitoring Report #4

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis - General contractors

Project: [redacted]

Date of Monitoring: May 15, 1979 (working day 350)

Monitored from Issue #9 dated March 30, 1979 (working day 318)

Approximate start of field construction - June 19, 1978 (working day 119)

Approximate target date for completion - September 3, 1980 (working day 682)

Actions Taken:

- Inspected project
- Reviewed current project status with Mr. Willam, Mr. Eve, Mr. Bruce McQuade, and Mr. Freij
- Evaluated current job status

General Summary

At this monitoring, we looked at four basic project elements; the cast-in-place basement and plaza decks, the slip formed core, the structure at the storage and cafeteria levels and the perimeter space and exterior walls at upper floors.

At the basement floor pour one and half of two have been made. This encompasses a major section of the floor at the west end basement level. The second half of puor two was not made at this time for framing reasons and will be done at a later date. Pour B-3, at the southeast corner, is being formed and will be poured about May 21, 1979 (working day 354). It was due to be poured no later than May 3, 1979 (working day 342) and so will lag about 12 working days.

The basement and plaza level pour sequence was set up so as to complete the last pour by October 26, 1979 (working day 465). The sequence becomes quite important to completing major cast-in-place concrete work at the basement level and plaza level by start of cold weather.

Corner columns have been built to the basement level and active work is underway for construction of the southwest column to the plaza level. Forming for the plaza deck will start shortly. Plaza deck work was due to begin no later than May 4, 1979 (working day 343).

Exterior walls to the plaza level are partially poured at pour B-1 and columns are presentally being completed to the plaza level at this area.

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CONSULTING ENGINEER

There has been some internal job competition for manpower in trades used in fixed form and slipforming work. However, this should even out soon, and free up additional manpower for lower decks and cast in place work at the storage and cafeteria levels.

To date, shift work on the job has not been instituted as a regularly scheduled operation. It is presently being used as manpower and material is available.

At the core, slipforming has proceeded to elevation 211'-6". There it has been stopped to allow for construction of some core decks at lower levels. A decision has been made to revise the sequence of core floors construction. Presently the basement floor, fifth floor, tenth floor, fifteenth floor and twentieth floor will be poured out first. Once these are complete the intermediate floors will be built. This is a slight revision to the sequence but probably will not materially affect or slow the slipping operation itself.

The intent is to slip to elevation 273' by May 25, 1979 (working day 358). Originally it was intended to slip to the 11th floor, elevation 276' by no later than May 17, 1979 (working day 352). Thus, slipforming lag at present is projected at about six working days. However, the slipping operation is now past most of the critical areas upon which it impacted and there is some float time available. Slight delays in slipping are not serious except that they do adversely affect momentum on the job.

I should like again to mention that a sizable share of the work at each floor is concentrated in the core. Mr. McQuade, Mr. Freij and I made a brief analysis of the amount of work which is to be done at the core compared to the amount of work to be done on the perimeter of each floor. It appears that more than one half of the time to be spent on each floor is in the core itself. If we consider the core as a separate and distinct entity, and concentrate on work at the core as soon as each level is available, time might be picked up over the projected plan of work.

The present plan assumes that work will start on each floor as soon as topping is complete at the floor above. The suggestion is that a full scale interior rough and perhaps even finish operation could begin at each level in the core as soon as the floor there is available. Some mechanical risers are being placed at the core now and I suggest this installation be intensified as more of the core becomes available.

Work at the storage and cafeteria levels is presently being concentrated on erection of bents and girder bottoms for the entire perimeter of the building. Most bents are erected, wooden plank decking is installed for much of the perimeter and framing for beam bottoms and working space is being erected at the west and south. It is expected precast will begin arriving Monday, May 21, 1979 (working day 354). Erection should begin immediately though there is some question as to whether construction of form work for these large girders will stay ahead of precast delivery.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

The lag projected presently is about seven working days, although this could increase over the next two weeks to as much as twelve working days. However, once a pattern of work is developed on the large girder form, it is hoped the target established in the network model can be achieved.

Presently, the early start casting schedule for perimeter girders is as follows:

West Girder (W) June 11, 1979 (working day 368)

South Girder (S) July 2, 1979 (working day 385)

East Girder (E) July 10, 1979 (working day 388)

North Girder (N) July 17, 1979 (working day 393)

It was pointed out by Mr. McQuade that in girders (W), (E), S, T, and N there is float time available. In girders S, T, and N, there is only a very small amount, approximately 2 working days. Girder N is the last pour and is critical.

The platform at the storage and cafeteria level is the key that unlocks construction of the upper floors perimeter space and close in. Presently, it is anticipated precast wall panels, the most essential ingredient of close in will be delivered to the job site at the current target date of August 22, 1979 (working day 419). Prompt deliveries are the key to erecting exterior skin of the building along with the perimeter floor space and closing in the upper floors at the perimeter by mid-December, 1979. Again, I believe it is important to stress that some early work can be started in the core just as quickly as the core floor becomes available.

In summary, the project lags from seven to fifteen working days. It appears that if job patterns and sequences can be set quickly to bring field operations into conformance with the current plan of work (i.e. plan the work and then work the plan) the lag might be reduced, although as everyone realizes, the network model durations were cut tight.

It should be possible by regular monitoring of the project to observe trends in gain or loss and to more accurately anticipate the needs of the project over the next several weeks.

I shall be in touch with Mr. McQuade to establish the next monitoring session. Meanwhile, I would like to urge that constant attention be given to expediting all deliveries and front end items, and that full staffing of the project be maintained, so administrative and supervisory field activities are given adequate support.

Ralph J. Stephenson, P.E.

RJS:pat

To: Mr. Bruce McQuade
Mr. Dean Himquist
Mr. Carl Freij
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Subject: Monitoring Report #5

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis - General Contractors

Project: [redacted]

Date of Monitoring: June 19, 1979 (working day 374)

Monitored from Issue #9, dated March 30, 1979 (working day 318)

Approximate start of field construction: June 19, 1978 (working day 119)

Approximate target date for completion: September 3, 1980 (working day 682)

Actions taken:

- Inspected project
- Reviewed current project status with Mr. Willam, Mr. Eve, Mr. Bruce McQuade
- Evaluated current job status
- Prepared revised diagram, Sheet 1, for storage and cafeteria level structure

Corrected 1st Page

General summary:

As of June 19, 1979 (working day 374), six deck pours have been completed at the basement level, basically ringing the building at the south and west. The present goal is to complete pouring all decks that surround the corner columns, and then to defer completing the basement level slabs until the present construction ramp can be abandoned.

Reteel in the four corner columns is in varying stages of erection up to the bottom of the main girders at the storage level. The southwest column has been poured to the plaza level. The southeast column has been poured to the basement level. The northwest column has been poured to the basement level and will be poured to the plaza level next week. The northeast corner column has been poured to the basement level and further construction of it will be possible only after the S7 pour has been made, probably by the end of next week.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

There is some question as to the date by which the corner columns must be poured to an elevation five feet below the bottom of the girders. In the construction sequence notes on Sheet S81, the requirement appears to be an early step in the sequence. It would be desirable to clarify the needs of the structure now since the columns currently lag by approximately 15 to 20 working days. It may be that these corner columns are not necessarily as critical as it appears at present, but this should be confirmed. I will review the matter with Mr. McQuade at the next monitoring session.

At the plaza level, the first deck pour will be made June 27, 1979 (working day 380). This will then allow the southwest corner column to be poured from the plaza to the storage level. The rebar for this column is well along and should be ready for forming when the deck has been poured.

Some early work has begun on forming the second pour at the plaza. Generally the lag in the plaza decks is about 20 to 25 days measured against late start targets.

Although the plaza level deck is an important work deck, its most critical function is to permit backfilling to be completed at Washington Street and to allow a working surface from which work can proceed above the deck. The walls along Washington Avenue are presently constructed to the bottom of the plaza deck. It will be necessary to tie the plaza deck into these walls before backfilling can be started at the Washington Avenue side.

A determination should be made soon as to the need, from a time standpoint, of access to the plaza level deck for supply of materials to the job site. This will determine, to a large extent, how critical plaza deck construction actually is. We are presently working to a desired plan of work, and since there has been a lag experienced in it, a determination should be made as to the relative importance of this deck.

At the storage and cafeteria levels (3rd and 4th floors), the girder bottoms and precast T's have been erected except for access points for the crane at the west, south, east and north girders. The transverse girders, X, R, Y & T, are being formed presently. There has been a revision to the anticipated sequence of girder construction at the 3rd and 4th floor levels, and Mr. Willam, Mr. McQuade and I rediagrammed on Sheet G1, Issue #1, dated June 19, 1979 (working day 375) the proposed revised sequence. The intent now is to set rebar and tendons after which the inside form will be erected. Next, precast T"S will be set at the 4th floor, and then all or a part of the outside form will be put in place. Next the girder in part or totally will be poured, after which the girder can be cured, topping poured, and post tensioning take place.

For the two main girders, N and S (north and south), it is presently the intent to form the middle section of each of these girders along with the transverse girders, R, T, X and Y. Then the transverse girders, in their entirety, and the middle portion of the north and south girders will be poured out. Next the transverse girders will be post tensioned

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

after which the remainder of the north and south girders, at the ends, will be poured out. Meanwhile, work will continue on the west and east girders in the sequence described above. Generally work will flow from the south to the north to the west to the east. After girders at the north, east, south and west have been poured out, topping will be placed at the 3rd and 4th levels; next post-tensioning will proceed from the north girder to south girder to east girder to west girder. This sequence is still to be reviewed to determine its structural sequence applicability. This will be done by Mr. McQuade with Mr. Freij and Mr. Willam. Also, it was agreed that the durations for this revised sequence will be put on the logic in conjunction with the sub-contractors; thus, we should be able to identify the starting point for erection of facing panels and precast wall sections from this revised sequence.

The target for start of work on precast between the 4th and 5th floors was to be on August 22, 1979 (working day 419). The present lag over the original sequence is 20 to 24 working days, taking into account the revised sequence and making appropriate logic substitutions. Because of the change in the logic plan being considered now, I strongly recommend a detailed recommendation be made as to its structural sequencing acceptability. This should be done immediately.

At the core, slip forming has been completed to about elevation 313. It is expected the core will be up to the 16th floor, elevation 341, by June 21, 1979 (working day 376). The slip forming was originally in the Issue #9 network due to be at elevation 341 by May 24, 1979 (working day 357); thus, the lag is about 19 working days. This reflects itself in completion of slip forming by July 24, 1979 (working day 398).

A major need at the core will be a service elevator, and it is still hoped that such an elevator can be provided by late September or early October. However, the lag in core slipping may require re-evaluation of this date.

Another problem at the core has been construction of intermediate floor slabs. At present, the basement, plaza, 5th, and 9th floors have or are being poured. Forming for other decks is currently at work and should proceed rapidly as the shaft is cleared.

There has been an on-going discussion about concentrating on interior rough work at the core and this matter of early installation is still being evaluated.

Second shift work is now on a regularly scheduled basis, and although it has not yet reached full effectiveness, the work is productive because of the lessening of interferences and the availability of crane time.

In summary, the total project lag now ranges from 15 to 25 working days. There is a revised sequence to construction of the deep girder at the 3rd and 4th floor presently being considered. It is doubtful whether this revised sequence will result in any pickup in the lag; however, it may be of help in constructing and post-tensioning the girders. This matter is to be studied further.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

The present target for delivery of precast exterior walls and floors for the 4th and 5th floor is still August 22nd, 1979 (working day 419). Because of the present lag, it is doubtful that the project will be ready for these. Delivery may be deferred until early to mid September.

Mr. McQuade is monitoring the project on an interim basis. I recommend trending of the job be observed very carefully over the next month to determine if and where lags can be recaptured.

RALPH J. STEPHENSON, P.E.

RJS:jc

To: Mr. Bruce McQuade (original)
Mr. Dean Winquist
Mr. Carl Frailj
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

July 26, 1979

Subject: Monitoring Report 6

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis - General Contractors

Project: 7837

Date of Monitoring: July 24, 1979 (working day 338)

Monitored from Issue #5, dated March 30, 1979 (working day 318) and Issue #16, dated July 24, 1979 (working day 338)

Approximate start of field construction: June 19, 1978 (working day 119)

Approximate target date for completion: September 3, 1980 (working day 682)

Actions taken:

- Reviewed current job status with project field and office staff
- Diagrammed remaining work on girders at third and fourth floors
- Analyzed close up procedure for deep girder form work
- Analyzed remaining floor pour sequence at basement and plaza levels
- Reprojected project close-in date
- Identified methodology of doing core finish work

General summary:

Initial efforts at this session focused on diagramming completion of deep girder work at the third and fourth floors.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Mr. Deantoni, Mr. Rogers, Mr. Nackl, Mr. Eve and Mr. Brenner all were present for this session and reviewed and commented on the network model, Sheet G-1, Issue #10, dated July 24, 1979 (working day 398). This diagram identifies the third and fourth floor girder pour sequence. The pour sections given below refer to Mr. Deantoni's and Mr. Roger's revised procedure wherein the east and west girders are poured as a unit while the transverse girders and the north and south girders are poured in sections.

Dates of the new pours are as follows:

Section 1 - August 9, 1979 (working day 410)
Section 2 - August 17, 1979 (working day 416)
Section 3 - August 22, 1979 (working day 419)
Section 4 - August 29, 1979 (working day 424)
Section 5 - August 31, 1979 (working day 426)
Section 6 - September 5, 1979 (working day 428)

There may be some local deviation in these dates but overall they reflect a currently projected plan of operation that appears feasible, provided adequate manpower, equipment (primarily hoisting) and rebars are available as needed.

Once all girders have been poured out, the third floor will be either loaded or the topping poured concurrently with topping being laid at the fourth floor. Once toppings are laid and the load is imposed on the girders, they will be post tensioned after which the exterior precast panels at the third floor will be placed and the corner columns poured out.

When precast panels at the third floor have been placed, presently projected at September 27, 1979 (working day 444), erection of precast panels and floor at the fourth and fifth levels will begin. In the Issue #9 network, dated March 30, 1979 (working day 318), the starting date for exterior walls and floors at the fourth and fifth floor was August 22, 1979 (working day 419). The revised current target to start this work is September 27, 1979 (working day 444), a lag of approximately 25 working days.

To further analyze the work, a small detailed diagram for closing up girder forms from the point where rebar and cable is set was prepared with Mr. Rogers' help. This is shown on Sheet G-2, Issue #10, dated July 24, 1979 (working day 398). This small network should be given careful attention since it will set the method by which crews move from one construction element to the next. The sequence of closing up the form and getting ready for the pour is very important and will be essential

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to follow carefully with continuous good field management. In addition, of course, and as noted previously it is essential that materials, manpower and equipment be made available as needed.

Analyzing the revised starting date on precast at the fourth and fifth floors shows a new completion date for erection of top level precast of approximately January 18, 1980 (working day 522). It may be necessary because of the later date to add some weather time and thus it would be wise to consider completion of precast panels to be February 1, 1980 (working day 532). Obviously, every effort will be made by all sub-contractors on the job to avoid exterior winter work. Therefore, it is within the realm of possibility that this later date can be bettered. However, it should be maintained as a target at present.

As part of our analysis, we also reviewed the status of the slip formed core. Presently it is the intent of the slip forming contractor to be off the project by September 4, 1979 (working day 427). We are assuming at that point that the entire core with all floor pours is complete. Using this assumption and beginning rough interior work at the fifth floor upon completion of the core structure we should seriously consider installing rough and finish interior work at the core as if the core were a separate and distinct structure.

Extensive conversations were held regarding this matter and it presently appears to those concerned that with proper close-in provisions this could be done. The reason for the plan's importance is seen if it is considered that we could possibly start rough horizontal work on the fifth floor core as early as September 4, 1979 (working day 427). Assuming it takes about ten working days of rough work to begin hanging gyp board at the core, if the core was closed to weather at that point, gyp board could start and according to our current plan finish work at the core would take approximately 50 more working days. Thus, starting board at September 18, 1979 (working day 437) brings completion of fifth floor core finish work to approximately November 28, 1979 (working day 487). Assuming a ten day turnover cycle on core floors would allow us to complete core finish work on up the shaft, provided it was kept closed to weather, and be done with core finishes by July 29, 1980 (working day 657).

This is an optimistic schedule but on the other hand it does indicate a method by which time could be picked up in construction of the total facility.

The perimeter structure of the building (precast exterior panels and floor slabs) meanwhile would be erected as in the sequence noted above, bringing completion of the perimeter structural frame to approximately February 1, 1980 (working day 532).

I suggest this approach be carefully studied by the field and office management to see if it is a feasible course of action. It should be again remembered that the plan requires a weather proof core, and for winter work would require temporary heat.

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Mr. Rogers mentioned that the utility companies should be contacted now to insure that the utility steam line to the site be installed without delay. Apparently there is a sizable current backlog of work at the utility company and an early steam application should be made.

At the basement and plaza level, Mr. Rogers has planned the floor cores so that the Washington and Second Avenue sides can be backfilled by October 1, 1979 (working day 446). This will allow access to the plaza level deck which is presently intended to be used for storage as the tower structure goes up. Remaining floor slabs at the basement and plaza level will be constructed on an approximate one pour per week cycle.

Corner columns will continue concurrently with installation of basement and plaza floor slabs and are expected to be completed within the next 35 working days to just below the main girder levels. This brings their completion to September 12, 1979 (working day 433).

Again, a check should be made now as to whether the corner columns must be poured to this level prior to post tensioning. Present plans are to post tension starting on September 12, 1979 (working day 433).

The next item considered in our session was tunnel construction under Marquette Avenue. This tunnel has been summary diagrammed on Sheet 12, Issue #9, dated March 30, 1979 (working day 318). Present plans are to start work on the tunnel August 1, 1979 (working day 404) and to finish the major structural work prior to the onset of cold weather.

In summary, the current lag on the project can be measured directly by the newly projected start of work on erection of precast at the fourth and fifth floors. This lag shows as 25 working days over the Issue #9 network, dated March 30, 1979 (working day 318). However, it should be pointed out again that if a method is found by which work at the core can proceed somewhat independently of the floor perimeters in a closed in structure we might regain a portion of the present lag.

It should be noted that the slip form operation was completed on July 20, 1979 (working day 396) through the 22nd floor. The target for completion of slip form work was June 26, 1979 (working day 379), thus the lag in completion was 17 working days. Several floor pours still remain to be made in the shaft and are in work. Floors that have been poured are the basement, plaza, 5th, 6th, 8th, 9th, 15th and 17th in the core.

There have been some revisions to the structure to be used at the elevator penthouses. The easterly third will be slipformed; the westerly two-thirds will now be structural steel.

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Overall, the next three months will be critical for the project and every effort must be made to closely tie all operations together so the target dates reflected in the revised network model will be met.

Ralph J. Stephenson, P. E.

RJS:jc

To: Mr. Bruce Mequade (original)
Mr. Dean Sinquist
Mr. Carl Freij
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

August 21, 1979

Subject: Monitoring Report #7

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis - General Contractors

Project: 78:37

Date of Monitoring: August 21, 1979 (working day 418)

Monitored from Issue #10, dated July 24, 1979 (working day 398)

Approximate start of field construction: June 19, 1978 (working day 119)

Approximate target date for completion: September 3, 1980 (working day 682)

Actions taken:

- Inspected project
- Reviewed current job status with field staff
- Evaluated current job status

General Summary

As of August 21, 1979 (working day 418), the west and east girders have been poured out. Girder #3 (previously #5) is to be poured out August 27, 1979 (working day 422). Remaining girders will be poured out according to the following schedule:

Girder #4 (previously #2) - August 31, 1979 (working day 426)

Girder #5 (previously #6) - September 7, 1979 (working day 430)

Girder #6 (previously #3) - September 10, 1979 (working day 431)

The original target to complete the last girder pour in the Issue #10 network, dated July 24, 1979 (working day 398), was September 5, 1979 (working day 428); thus, the lag of the project presently over the Issue #10 network dated July 24, 1979 (working day 398) is three working days.

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Sizable amounts of work have been done over the past month and the project is gaining momentum with most intermediate targets being met on a day-to-day basis.

Topping at the third floor, to load the third floor area, will begin August 27, 1979 (working day 422). This is about six working days earlier then shown in Issue #10.

Corner columns are poured to within five feet of the deep girders at the northwest and southwest. At the southeast, the column is poured to just above the plaza level, while at the northeast, the column is poured to just below the plaza level. It is expected that all corner columns will be poured out to five foot below the girders in five to ten working days.

Presently, the plan is to complete pouring all girder elements before starting to post-tension. This means that, including curing time, post-tensioning will begin on September 17, 1979 (working day 436). The issue #10 starting date for post-tensioning was September 12, 1979 (working day 433).

At the core, ten floors have been poured, the 3rd, 5th, 6th, 7th, 8th, 9th, 11th, 12th, 15th and 17th. The 18th floor will be poured tomorrow, August 22, 1979 (working day 419). From there the pour sequence will jump to the 20th, 21st and 22nd floors. Remaining floors will be completed following the 22nd floor pour. Present target is to complete pouring all floors in the core by the latter part of October, 1979.

Enough core floors are now available so interior work at the core could begin, and efforts are being made to get a full sequence of rough work installation started. It is presently the intent to work up in the core treating it as a separate building, protecting and heating as required. Thus, this work will proceed somewhat independently of perimeter floor work.

There are current problems with sub-soil on the north side. Some fractured rock and caverns were discovered which forced us to excavate rock to explore where the caverns were located. This has taken considerable time and the exploration is still in work. If the soil investigation work continues for much longer, it will seriously delay construction of the basement floor supported deck, and consequently the plaza floor deck. The area is a very important section to bring up to plaza level, since cold weather is near. It can be expected that inclement weather will begin about mid November, which allows only 50 to 60 working days before weather delays can be expected.

The present schedule of Mr. Rogers is to complete the garage and plaza floor slabs by the first week in December, 1979. This appears feasible at present if sub-soil conditions are corrected quickly.

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Another important element in the tower is construction of the concrete and steel stairs. Presently, steel stairs are erected to the 14th floor. This work will continue on up to aid in expediting foot traffic between floors.

Rails for service elevator #15 are just being put into work and it is still desired to have an operating service elevator by mid November, 1979. It is a very tight schedule since in order to complete the major portion of the elevator work, it will be necessary to close in the shaft. Plans are in work to do this. There is also a current strike at the Westinghouse plant which is delaying delivery of elevator components.

Mr. Rogers said that, in order to assist in pouring the floor toppings at perimeter floor areas, a skip hoist is being installed in one of the shafts. This should help to free up hoisting equipment for precast elements of the building.

Precast wall units are beginning to arrive in Minneapolis and the present target to start erection is being held at September 27, 1979 (working day 444), the date mentioned in monitoring report #6, dated July 26, 1979 (working day 400). It was noted there that the lag of the start of precast over the issue #9 network model, dated March 30, 1979 (working day 318), was 25 working days. Thus, this lag is currently projected as remaining the same; however, it should be pointed out that, with work proceeding independently at the core, the analysis on page 3 of monitoring report #6, dated July 26, 1979, still remains valid.

The utility steam line to the site has been installed. Also work at the connecting tunnel is underway. Tunnel work has proceeded somewhat more slowly than anticipated because of the recent excessively wet weather. Backfilling at Washington and Second Avenues is underway and after about another week's work on the deck, can be completed. This will allow direct access from the street elevation, and should aid materially in stockpiling materials on the job.

In summary, the current lag on the project over the Issue #10 network, dated July 24, 1979 (working day 398), is about three working days. However, as the work proceeds and gains momentum, it appears this could be recaptured and so we are presently holding a start of precast at the third floor of September 27, 1979 (working day 444).

The slip form operation has been completed and work is proceeding on floor pours, with ten of them being complete as of today with one more due to be done this week. The critical push now has to be to clean up as much of the cast in place concrete work by early or mid November, 1979 so as to minimize the amount of cold weather work. Present progress indicates that there is a good chance of this being achieved.

Ralph J. Stephenson, P. E.

RJS:jc

Mr. Bruce McQuade (6)
Mr. Dean Winquist
Mr. Carl Freij
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

October 23, 1979

Subject: Monitoring Report #8

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis - General Contractors

Project: 78:37

Date of Monitoring: October 17, 1979 (working day 458)

Monitored from Issue #9, dated March 30, 1979 (working day 318)

(Note: This monitoring is from manually computed sheets 1-31.)

Approximate start of field construction: June 19, 1978 (working day 119)

Approximate target date for completion: September 3, 1980 (working day 682)

Actions taken:

- Inspected project
- Reviewed current status of project with Mr. Fred Rogers
- Reviewed project status with Mr. Carl Freij

General Summary

At the lower levels, the rock fault problems encountered at the north side have been resolved, and work is now actively in progress to bring this lower portion up to plaza level. Mr. Rogers is planning to complete all slabs-on-grade at the garage and the lower (to plaza level) structural frame by mid-December, 1979.

The tunnel structure is built across half of the street. The other half of the tunnel will be complete about the same time as the plaza level.

There are currently discussions under way regarding the early use of the facility for parking. This matter is currently under consideration by the owner and the contractor.

All corner columns have been poured out to within five feet of the deep girders and finish precast cladding is being put on the columns.

At the third and fourth levels, the large structural members are poured out, and post-tensioning is expected to be complete by the end of this week. Exterior facing panels are being erected on these girders.

In the core, all floors except at the penthouse, 13, and 14 have been substantially poured out. Remaining floors are to be completed by the end of next week.

The mechanical equipment room fans are set through the 11th floor, and sheet metal duct work has started on the 6th floor at the core. The core is generally weather tight to about the 10th floor with minor exceptions. The intent is to continue temporarily closing in the core to whatever elevation needed so rough and finish work both can continue throughout cold weather.

Toilet room rough-in is well along through the 11th floor with some mechanical risers in to about the 13th floor. Service elevator installation is moving well, and Mr. Rogers reports they expect to have it ready for use by mid-November 1979. Other elevator work is proceeding, meanwhile, with rails now being installed in the shafts.

A skip hoist is presently being erected in the core and will be used in the early stages to hoist concrete for floor toppings. This hoist will be later able to be used for other purposes.

Provisions presently are being made to obtain as much hoisting capacity as possible, preparing for when erection of precast facing panels and deck begin on the upper floors at the perimeter. Strong efforts are being made now to use available hoisting equipment to get major mechanical items placed on the floors.

Steel stairs are generally available from the 5th floor to top areas. Thus, access to the building by stair and by temporary hoisting facilities is currently fair with improvements expected as additional lifts are installed.

Mr. Rogers said that precast walls and floors at the 4th and 5th floor will start next Thursday, October 24, 1979 (working day 463). He anticipates erecting one floor of

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precast a week to the tenth level after which the cycle will probably be reduced to one floor each four working days. The four day turnover cycle was utilized for our early analysis in Issue #9, dated March 30, 1979.

In that network model, precast was due to begin no later than August 22, 1979 (working day 419). Thus, the lag in erection of precast for the facing and floors at upper levels is about 44 working days or two months.

I suggest that it is appropriate to measure current status of the building not only by exterior precast but by a review of the progress being made the core of the building in installing rough interior work.

The sequence that will be followed at the core is the same as shown on the network models for interior work, sheets 14-31. In analyzing these models, the start of rough sheet metal, piping, electrical, sprinkler work, and some architectural rough trades was to begin at times varying from September 19 (working day 488) to October 10, 1979 (working day 453). Work at the 5th floor, which was the planned starting point, has been bypassed temporarily, but at the sixth floor, considerable rough work has been started. Air handling units are being installed, sheet metal duct work has begun, and mechanical piping is in work. Sprinkler work has not yet been started. Work due to be in progress was expected to begin by October 10, 1979 (working day 453). Rough work at upper floors in the core is slightly ahead of projected late start dates.

So it appears we are almost on schedule at the core for interior rough work, and if Mr. Rogers can get the area closed in so installation of finish trades can begin shortly, it is possible that interior work will move back in even closer alignment with our Issue #9 targets.

A key date in the core is the earliest time at which we anticipate being able to hang board on the concrete walls. In the Issue #9 network, dated March 30, 1979 (working day 318), core board was due to start no later than October 10, 1979 (working day 453). There is no current word on when this will start, but heavy efforts are being made now to prepare the areas for start of board.

It should be emphasized that finishing the core is not going to be an easy job. There is considerable work that must be accomplished as rough work is installed, but again, heavy efforts are being made to treat the core as a separate facility and to proceed with work in it as rapidly as possible.

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Although there has been some concern about the use of slipforming for the core structure, the fact that it is standing and ready for work does present some available opportunities to make good progress over this coming winter. However, progress will depend upon closing in the core to ready it for finish work and to have and maintain adequate hoisting and manpower on the job.

The client has indicated there are two floors they would like to have available for early occupancy. This may be a very difficult assignment because to occupy or use the building, it is essential to have access at the lower levels and to have a clear and safe pathway for those who work in the building to reach their floors. Thus, there is some need presently to give attention to the planning of finish work at those areas still remaining to be diagrammed. I suggest this matter be addressed soon. It should be pointed out, however, that we do currently have a working network model for all interior finish work on typical floors. The special floors remaining have some similarity to the typical floors but require that additional finishes be tied in to the standard floor diagram. I shall review this matter with Mr. McQuade soon.

In summary, the project is now ready to start erection of precast at the major deep girders. Erection of the building skin at this point is about 44 working days behind our desired target shown in Issue #9, dated March 30, 1979 (working day 318). However, core interior rough work has moved well over the past month and a half, and there the lag is considerably less, ranging presently from 10-20 working days. At the other core floors, installation of rough work is slightly ahead of projected plans.

I continue to recommend strongly that core area work be focused upon intensely as it is the most complex interior portion of the building. Mr. Rogers is doing this, and presently plans are to maintain a heavy work operation there throughout the fall and early winter months by temporarily protecting areas that require weather closure.

As noted above, further diagramming on the project will be discussed with Mr. McQuade in the near future.

Ralph J. Stephenson, P.E.

RJS:sps
Mr. Bruce McQuade (original)
cc: Mr. Dean Winquist
Mr. Carl Freij
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

February 13, 1980

Subject: Monitoring Report #9

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis - General Contractors

Project: 78:37

Date of Monitoring: January 28, 1980 (working day 528)

Monitored from current project status reports and from Issue #9, dated March 30, 1979 (working day 318)

(Note: Network monitoring is from manually computed sheets 1 through 31.)

Approximate start of field construction: June 19, 1978 (working day 119)

Approximate target date for completion: September 3, 1980 (working day 682)

Note: This target finish date is still being worked to although there will be dislocations from it at various parts of the building.

Actions taken:

- Inspected project
- Reviewed current job status with project team, both field and office
- Diagrammed first floor lobby and plaza work
- Evaluated current job status

General Summary

In the core, most riser work is installed to the 22nd floor and mechanical equipment is set through the 19th floor. On some of the floors there still remains miscellaneous work to do on risers and equipment but essentially the work is well out ahead of work that follows.

Elevators are presently being installed and rails are in for both the high rise and a portion of the low rise shafts. One of the shafts is currently being used for a material hoist, and further work there will be deferred until the material hoist is removed. Work on elevators is moving fairly well, although a full evaluation of the tentative target completion was not made at this monitoring. A service elevator is currently in use for the full height of the building.

Above floor rough sheet metal is partially installed through the 6th floor with sheet metal risers in the shafts all the way to the top. Rough plumbing work, primarily at toilet rooms, is complete through the 22nd floor.

As of today, there is no stud work or furring under way in any of the core areas. Stud and furring installation, of course, is the start point for interior finish work, and Mr. Rogers estimates that he will begin stud work about February 4, 1980 (working day 433). Stocking the floors with dry wall materials is in progress at present and once studs and furring start, it is expected to maintain continuous activity since the rough trades are now far enough out ahead so that they probably will not be caught by finish trades.

Projecting times from current status shows the occupied upper floors will probably be complete by mid or late December, 1980. However, it appears presently possible that if an early determination is made as to which floors are desired first, we may be able to complete interior work at these floors early, particularly in the lower half of the building. Also, the lobby could be ready for use, although construction will probably still be proceeding there, by mid-September, 1980.

It is very important that the owner, the architect, and the contractor sit down now and determine occupancy requirements of this facility because the sequence of the floor finishing desired must be determined immediately if progressive partial occupancy is to take place. It also should be remembered that the break in the high rise and the low rise elevators should be a factor in deciding which floors are to be occupied first. Efforts should be made to occupy those floors first that are served by the same bank of elevators.

Presently precast panels and floors are erected to the 11th floor with wall panels going up to support 12. The cycle on precast is presently at about 6-1/2 days per floor and thus, we should be able to stay ahead of interior finish work as it begins. Glass is on the job, and exterior glazing is expected to begin today, January 29, 1980 (working day 529).

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As part of our planning work, we prepared network models for interior lobby work at the first floor and for a portion of the plaza level work both at the floor and at the ceiling.

Procurement work for the first floor interior lobby areas is very critical, and we have listed the most important of these items on sheet P-1, Issue #1, dated January 28, 1980 (working day 528). Or special concern is delivery of curtain wall. Presently, revised shop drawings are being prepared in accordance with change proposal #29, and these are expected to be submitted in about three weeks. After review and approval, the fabrication and delivery of the curtain wall is expected to take 120 working days, bringing material to the job by September 4, 1980 (working day 683). Fron this point erection of curtain wall proceeds, followed by glazing, and completion of interior and exterior marble. Since the curtain wall is so critical to the entire use of the main lobby area, I suggest strongly that efforts be exerted to shorten delivery times. Other critical procurement items are being watched carefully by the project team and should be followed on a day to day basis.

At the interior of the main lobby, the high area is probably to be scaffolded by a hung structure which should allow work to proceed below independent of above scaffold work. Ceiling work at the lobby depends to a certain extent upon installation of curtain wall brackets, and these should be brought to the job as early as possible.

On sheets #1 and #2, Issue #1, dated January 28, 1980 (working day 528) we show general completion of work in the high lobby area, exclusive of a small amount of marble, at a completion target of early September, 1980. The lower areas to the east and west of the interior of the lobby, work can probably be completed in mid-October, 1980.

To be noted is the installation of the elevator control console and the fire alarm control system. Both pieces of equipment could prove difficult to obtain and should be worked upon now.

Exterior work at the plaza level can be broken into that at the floor level and that at the ceiling. We were able on Sheet 3, Issue #1, dated January 29, 1980 (working day 529) to begin diagramming plaza level work, but were not able to complete this and require additional data especially on procurement of critical items before it can be completed. However, we did complete the diagram of the plaza ceiling work, and present plans are to complete installing the plaster ceiling

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at the plaza soffit by about August 27, 1980 (working day 678). This plan model should be checked carefully by the project team since it is a very tight schedule and may have to be extended particularly in some of the mobilization and removal areas. In addition, there undoubtedly will be some interferences from the plaza level work with the ceiling work and these have not, in the present model, been totally analyzed. It would be better to consider that the plaza ceiling probably will be complete in mid or late September, 1980.

Of special importance is timely removal of the west tower crane since this crane now sits in the outside area of the lobby and must be removed before the ceiling there can be completed. In addition, the floor slab above the ceiling will have to be constructed in order for the ceiling to be installed. Thus, the west tower crane removal is a pivot point for completion of the work on the plaza ceiling.

Procurement is a very important element of lobby and plaza finish work and on sheet P-2, Issue #1, dated January 29, 1980 (working day 529), we have shown a few of the more important procurement items in the diagram with others listed to the left of the diagram. There are many miscellaneous precast elements that must be put into work, and these as with procurement for the interior lobby work, should be done as quickly as possible.

In summary, it appears that occupancy of the lower portion of the building for the start of tenant work could possibly begin in early or mid September, 1980. Access will be through areas that are not quite complete at the plaza level. Lobby areas at the plaza will generally be complete in mid to late September, 1980, and it is presently planned to complete all of the upper floors to turnover by mid to late December, 1980. Naturally, any compression in time that is possible will be made. To repeat, procurement of materials and equipment is still of utmost importance to insure completion by present targets. Changes to the job from here on are very costly and disruptive, and it is to be urged that all change proposals being considered be cleared and resolved promptly.

We shall plan to monitor the project from these sheets #1, #2, #9, and sheets P-1 and part of P-2, Issue #1, dated January 28, 1980 (working day 528) and January 29, 1980 (working day 529) in subsequent monitorings. Meanwhile, the field staff will review these diagrams and check them to insure that they do represent a valid and achievable plan of action.

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CONSULTING ENGINEER

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

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Bruce McQuade

cc: Mr. Dean Winquist
Mr. Carl Freij
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

February 28, 1980

Subject: Monitoring Report #10

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis - general contractors

Project: 78:37

Date of Monitoring: February 19, 1980 (working day 544)

Monitored from Issue #1, sheets P-1, 1, 2, 3, and 4, dated January 28, 1980 (working day 528) for plaza level work and upper floor sheets in manually computed network, Issue #9, dated March 30, 1979 (working day 318)

Approximate start of field construction: June 19, 1978 (working day 119)

Contract target date for completion: October 1, 1980 (working day 702)

Note: Requests have been made for extensions of time to this contract date and are presently pending. Resolution should be made of these requests for extensions of time as quickly as possible.

Actions taken:

- Inspected project through 14th floor
- Reviewed current job status with field and office project staff
- Prepared network model for construction of corner columns to 9th floor
- Reviewed format of presenting data regarding key scheduled target dates on building components

General Summary

Precast walls sections are erected to the 13th floor and the precast floor deck is erected at the 13th floor. Additional erection of precast wall and floor units is now held by a directive of the architect/engineer until corner columns have been poured out to the 9th floor. We prepared a network model

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of the sequence of action required to get the corner columns up to that level, and set a target date for completion to nine at the southwest, southeast, northwest, and northeast corners of May 2, 1980 (working day 597). When corner columns are complete to nine, the main girder bents at the plaza level can be removed and precast erection resumed.

After corner columns are poured out to the 7th floor we can lay topping at the 12th floor. Topping can proceed to subsequent floors as each floor of corner columns is completed. Official approval of pouring the 12th floor topping after the columns have been poured to the 7th level has not yet been given but is expected soon.

A present major goal of the field activity is to start installing furring channels on concrete walls and erecting studs just as quickly as possible, probably by Thursday, February 21, 1980 (working day 546). The intent is to begin an aggressive plan of work that will see studs and furring erected followed immediately by hanging dry wall at the core. Dry wall is expected to begin at the core about 5 working days after the start of furring and studs.

The present plan of interior work indicates that floor work at the core of a single floor could be finished about 54 working days after board starts. It further indicates that the floor could be available for start of tenant work in 20-30 working days after the start of board. This time contemplates a highly compressed plan of work and it may not be desirable to allow tenant work to begin so far ahead of anticipated completion of the core finishes. By pursuing interior work on an aggressive and continuous basis finishing trades could move from floor to floor in approximate 10 day increments. That is, finish work will proceed on a 10-day turnover cycle, with a floor being completed every ten working days.

Present indications are that the 5th floor could be completed as early as May 7, 1980 (working day 600) and every effort is to be made from that point to maintain a delivery of a floor every 10 working days.

The present delay to continuing erection of precast wall and floor elements will delay removal of the tower crane and material hoist to a later date than presently desired. These later removals, in turn, will undoubtedly delay completion of finish work at the plaza and finish work at each floor where the tower crane penetrates the deck. The reason for this is that once the tower crane is dismantled the remaining

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May 1, 1980

Subject: Monitoring Report #11

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis - general contractors

Project: 78:37

Date of Monitoring: April 24, 1980 (working day 591)

Monitored from Issue #10, dated February 18, 1980 (working day 543)

Note: This network issue consists of sheets 1 through 48, prepared by Mr. McQuade and his staff from rough diagrams assembled during the past several months.

The project was also monitored against the Issue #9 network, dated March 30, 1979 (working day 318) for a cross check on current projected completion dates.

Approximate start of field construction: June 19, 1978 (working day 119)

Contract target date for completion: October 1, 1980 (working day 702)

Note: Requests have been made for extensions of time but to this date none have been granted. This matter should be resolved as soon as possible.

Actions taken:

- Inspected project
- Reviewed current job status with field and office project team
- Discussed pending difficult areas and their resolution
- Reviewed interrelationship of future construction work at the core and tenant areas

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General Summary

Precast wall sections are erected to the 16th floor, and precast floor deck is being set presently at floor 16. Topping is being poured out at the 14th floor; and tenant work areas are progressively being closed in with rough work being installed close behind placement of concrete topping.

At the core areas, modifications are being made at the upper floors with most adjustments being complete through the 18th floor. Elevator work is moving well with platforms for the shuttle elevators and both the high and low rise banks being installed. All elevator frames for the high rise elevators are in place, and most are in place for the low rise elevators. Vertical transportation is rapidly becoming an extremely important work element to complete on the project, and it is urged that additional elevators for construction operation be made available just as quickly as possible. The intent is to next provide one high rise and one low rise elevator for construction use. Platforms for the construction elevators are installed and the major current delay to putting them into service is delivery and installation of controllers.

At the penthouse, exterior walls are being formed, and some have already been poured. The penthouse walls will be taken to the roof of the core and then precast facing material will be set for both the core and the cast in place concrete penthouse. The remaining roof structure of the penthouse will also be cast in place concrete, presently due to be complete by early September, 1980.

Of prime planning importance is the possibility for additional strikes in various key trades. The electricians went on strike April 11, 1980 (working day 582), and the following contract expiration dates should be noted since they will affect the project and could cause delays:

Pipefitters - April 30, 1980 (working day 595)

Sheet metal workers - April 30, 1980 (working day 595)

Plumbers - May 31, 1980 (working day 617)

Sprinkler fitters - June 30, 1980 (working day 637)

Asbestos workers (insulators) - June 30, 1980 (working day 637)

Presently despite the electricians strike, work is continuing well on wall studs throughout the project, and there probably can be considerable board hung before work will have to stop

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because of lack of in-wall electrical installation. However, over the next few weeks even though some strikes do occur, it should be possible to continue with erection of precast walls and floors, installation of studs, construction of corner columns, and construction of the penthouse.

As part of our analysis, we made a projection as to the current position of the project relative to the network model standard of performance, and also identified sequences to be evaluated that might help shorten the total job length from now to completion. The evaluation of the job against the Issue #10 network model, dated February 18, 1980 (working day 543) indicates that at the fifth floor we have remaining at core, if work proceeded from today, about 40 more working days of work to complete the first typical floor. Applying the same rationale to the tenant areas, there appears to be about 31 working days from today to complete the first typical tenant floor. Assuming a 10-day turnover cycle at the core, the projected completion of the remaining 17 floors of typical floor areas would be February 20, 1981 (working day 801). The remaining typical tenant areas would be complete by February 9, 1981 (working day 792).

In our review of the job we discussed what might happen if we were able to throw the full work force possible on the core areas and to focus intently on getting this work done while putting the tenant areas in temporary abeyance. This might allow us to work multiple floor crews in the core, and could conceivably reduce the turnover cycle from the present planned 10 days. Doing this could bring the completion of the core back to an earlier date. For instance, if we used 8 days as the turnover cycle due to the intensification of work, we could complete core work by January 5, 1981 (working day 767).

However, at some point it would be necessary to begin work on the tenant floors, but it is entirely possible there that by that time we could reduce the turnover cycle on the tenant floors due to the nature of the work and the fewer trades required. If, for instance, we could reduce the turnover cycle on the tenant cycle on the floor space to five working days it would be possible to defer start of remaining work on tenant floor areas to sometime late June or early July, 1980.

This was a somewhat complex analysis and may be overly simplistic for use in analysing the current situation. It should be remembered that there are multiple reasons why the delays to the floors so far have slowed the job. In order to shift the focus of attention on the core work it will be necessary to resolve many problems presently pending. We

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discussed these in principle, and the decision was made that a complete comprehensive list of unresolved job problems that affect the core typical floor and the tenant typical floor would be prepared. It then will be possible to identify, with the architect/engineer and the owner, what assistance will be needed from them and what activities will be needed from us to carry out a suitable plan of action.

I strongly suggest that the upper floors (5th floor and up) be kept as a single discussion package so we can focus a heavier work effort at the typical floors as soon as possible. This same methodology should then be used on work to be completed below the fifth floor. It is at the lobby and plaza areas along with the food service, cafeteria, and other activities at the 4th floors, where major problems needing resolution exist. By breaking the building into two separate sections we can keep the upper areas independent of lower area problem resolution.

In any event, I recommend that a detailed evaluation be made of the heavy thrust of work needed now that the threat of work stoppages in key trades hangs over us. Although it is only a few days before the next contract expires (pipefitters and sheet metal workers) we do have some time before the plumbers, sprinkler fitters, and insulators contracts expire. Thus, <u>any</u> time we can gain will be of help. We also should be planning the best condition in which to leave the job in the event that there are work stoppages in any or all of the trades.

At the lower areas, the bents have been removed from the east and north girders. This has freed up space both at the plaza and in the lower areas of the core building. At the south and west girders the shoring is being removed just as rapidly as possible. It will probably be dismantled totally within the next 10 to 15 working days. This, in turn, should allow removal of many of the temporary supports on end bay girders at upper floors which are presently a mild interference to interior work.

At the lobby area, sheet metal duct work is almost complete, and plumbing and some piping work has begun. A scaffold is to be erected in the lobby area to allow rough trades to carry out their work.

Because of the press of time and lack of detailed information we were not able to monitor the procurement network model for the lobby on sheet #1 of Issue #10, dated February 18, 1980 (working day 543). However, I suggest that Mr. McQuade work with the field expediting group to evaluate the present status of procurement.

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There has been some difficulty in obtaining commitments on the Vermont marble. It has been quarried and is just now being fabricated. Deliveries, however, of both the Italian and the Vermont marble are not expected to begin until early September, 1980. This could seriously delay work at the lobby and should be followed continuously to see if an improvement in delivery time can be made.

There are many other very critical procurement items; however, this entire procurement package will be thoroughly evaluated by Mr. McQuade. I suggest we also pay careful attention to procurement of both information and equipment for food service areas at the 4th floor. This equipment generally is a long lead time item and its setting and installation requires considerable hookup on the part of related trades. Therefore, it is usually a potential delay activity.

At the lower levels, basement and sub-basement, work is progressing well and equipment room progress has been good over the past month. There seems to be few problems except the electricians strike and the possibility of a strike in key mechanical trades. Tunnel rough structural work has been completed and finishes there will be installed with the finishes in the lower level areas.

Overall, the project progress indicates it will be complete sometime in early 1981. However, earlier progressive occupancy of lower floors can still be planned upon as these floors are complete. This is particularly the case where sizable amounts of tenant work must be done because preparation of the rental areas for start of tenant work is relatively straight forward. If there is a desire to begin tenant work within the next 44 to 88 working days (2 to 4 months) it would be appropriate to discuss this matter in depth with the project team so selective sequencing work on the floors can be pursued. Presently the intent is to move up on the floors one by one from bottom to top (5 on up).

I again recommend that serious consideration be given now to methods by which the decision making process involving contractors, sub-contractors, the owner, and the architect/engineer can be expedited. As the job nears its completion point, presently only 210 working days from today, the need for rapid response on technical information is imperative. Sometimes it is only possible to get this information turned around by being able to speak face to face and work on an intense hour by hour basis with those who make the decisions. Thus, I suggest that the parties involved in the project, the contractors, the owner, and the architect/engineer provide the staff needed to expedite decisions that will be required as the job is brought to completion.

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The procurement operation must be given a high degree of attention and expediting on a day to day basis as they job moves into its final stages. In addition, the start of tenant work dovetailed with the latter portions of actual building construction work pose vertical transportation problems, storage difficulties, and work interference problems that must be worked out carefully by the project staff. Close attention to procurement is essential so the building areas are cleared just as quickly as possible and materials are put into place as they arrive on the job site.

It also is important to give constant attention to maintenance of vertical access to the building. Present plans are to improve this accesss on a progressive basis as permanent elevators are made operative.

In summary, the project currently lags the Issue #10 network, dated February 18, 1980 (working day 543) by about 20 working days. This puts the projected completion at mid to late February, 1981. Efforts will be made to compress the remaining time to completion by re-evaluating and possibly replanning the present turnover sequence at the core and at tenant areas of the typical floors. It is also essential that with a winter completion, all exterior work be finished prior to the onset of cold weather. Generally, we can assume that all plaza finishes and other areas outside the building line must be complete no later than November 17, 1980 (working day 735) and preferably by the beginning of November, 1980.

I shall plan to monitor the project again in the near future and will be in touch with Mr. McQuade to set the date.

Ralph J. Stephenson, P.E.

RJS:ps

To: Mr. Bruce McQuade

cc: Mr. Dean Winquist
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

July 9, 1980

Subject: Monitoring Report #12

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson Construction Co. - general contractors

Project: 78:37

Date of Monitoring: June 24, 1980 (working day 633)

Monitored from Issue #10, dated February 18, 1980 (working day 543)

The Issue #10 network model dated February 18, 1980 (working day 543) anticipates a completion date for the entire project of January 26, 1981 (working day 782). Monitoring at our session today was from that network and information in this report relative to the position of each element of the project is measured against this model.

Approximate start of field construction: June 19, 1978 (working day 119)

Contract target date for completion: October 1, 1980 (working day 702)

Note: Requests have been made and are continuing to be made for extensions of time. As of today, none have been granted. The matter should be followed and resolved just as quickly as possible. This is particularly the case since the recent electricians' strike has imposed a further time delay upon the job of considerable length.

Actions taken:

- Reviewed current job status with field and office project team
- Reviewed desired target completion dates
- Analyzed turnover sequence for core and tenant space work
- Reviewed manpower requirements for completing project at various target dates

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- Reviewed several graphic techniques for conveying key information to entire project staff

- Evaluated current job status

General

Electricians went on strike April 11, 1980 (working day 582) and returned to work June 9, 1980 (working day 622), a period of 40 working days. It should be noted that start up of work following the strike has been exceptionally difficult due to the very high demand for electricians. Present indications are that it will require 20 to 40 working day to again regain a pace similar to that prior to the strike. It may prove difficult to get production back up to the pre-strike level even in that period, and therefore extensions of time should take into account the slow start up period now being encountered.

Procurement (sheet #1)

The procurement network is brief and contains only remaining major elements that may pose delivery difficulties. A brief review of each of these is given below:

- First floor elevator door frames are to be delivered September 2, 1980 (working day 681). Tentatively, they will be set after cabs are installed. Cabs are due on the job September 17, 1980 (working day 692).

  The question of sequence is still to be finally resolved, and it is possible that cabs will be disassembled and installed through the elevator door frames.

- CP-32 is being assembled for submission. This revision will influence some first floor hollow metal frames and doors along with wood door frames.

- Catwalk structural steel is not yet on the job.

- Exterior curtain wall is to be shipped this week. I suggest that the shipping pro number be obtained and followed to insure the material arrives in timely fashion.

- Lobby marble is to be put into the sawing mill July 14, 1980 (working day 646). Sawing is to be completed August 6, 1980 (working day 653), and marble will begin arriving on the job October 13, 1980 (working day 710). The final shipment is due November 10, 1980 (working day 730).

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- First floor exterior marble is expected to start arriving on the job August 11, 1980 (working day 666) with the last shipment planned for November 4, 1980 (working day 726).

- Chandelier information has been obtained and the sleeve is being installed in the third floor deck through which cable supports will be run to the hoisting support set on the third floor.

- The chandelier is presently being fabricated and will be delivered soon. It can be brought in the east side entrance, and therefore no special arrangements will have to be made for getting it into the building.

- Resilient floor colors have been selected, but no tile samples have been submitted for review and approval.

- No carpet color data has been obtained as yet from the owner.

- Revolving door shop drawings have been approved and delivery is expected August 15, 1980 (working day 670).

- There was no word available today on fabrication and delivery of reception desk elements. These may be a late delivery, and I suggest they be followed carefully.

- A contract for return air grills at the first floor lobby will be awarded shortly. This may be a long lead time item.

- Curtain wall structural steel is delivered and on the job site for the north side. There is no current word on south curtain wall structural steel.

- Planter facing panels at the plaza are in fabrication.

Overall, major procurement is in fair shape. However, the possibility of missing critical delivery items at this stage of the job is always a potential problem. I, therefore, suggest that a careful review of the contract documents be made now to insure that there are few, if any, loose delivery ends remaining.

As we reviewed the project today, it was considered desirable to evaluate a method by which active information about the current status of change proposals (CP's) could be made

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available to all concerned. I recommend that a graphic time scale depiction of the pricing process and the conversion of CP's to change orders be prepared not only for CP's that have been issued but also for all those pending. It will be important to reduce to a minimum changes made to the job from here on since long lead times required to process the changes and obtain materials are bound to affect the job and its completion date.

Structural frame and exterior close in (sheet #3)

Corner columns are being poured out to the 19th floor today, and precast work is complete through the 22nd floor. Roof deck precast is presently being set. There was a breakdown of the yard crane at the precast roof deck supplier's plant Friday, June 20, 1980 (working day 631). The crane is still down and has temporarily delayed shipments to the job.

Topping is being poured out at the 21st floor and will be complete at the floor June 25, 1980 (working day 634).

Frames and glass are substantially complete through the 15th floor with the 16th floor being stocked. Parapet precast delivery will be affected by the yard crane that is down; however, Mr. Rogers expects the parapet to be erected by July 9, 1980 (working day 643). Once parapet precast is in place and the corner columns have been poured out, the west tower crane can be dismantled. This is presently expected to be during the last week in July, 1980.

At the penthouse, walls to elevation 469'6" are being poured and should be complete by June 30, 1980 (working day 637). This work will be followed by completion of the penthouse roof, and then erection of exterior precast panels. Close in precast panels are due on the job in mid-July, 1980.

Elevators

The low rise elevators at the south bank are running and ready for inspection. The material hoist at the north bank has prevented elevator work there from proceeding. However, as soon as the material hoist is removed the last week in July 1980 work can proceed on the north low rise elevators.

High rise elevator equipment is being installed with all high rise elevators able to be run on temporary power. It is the intent to activate one of these within the next two weeks. The shuttle elevator is also installed and running, but because of power limitations cannot be used.

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Basement and sub-basement work

At the sub-basement, masonry, doors, and frames are being installed and fan room equipment is delivered and set. Sprinkler work is in reasonably good shape. There has been no work started as yet on furring channels or board at the sub-basement.

In the basement, above floor mechanical piping, rough electrical work, and sprinkler piping is moving fairly well. Sheet metal duck work has just started.

As part of our discussion today, we reviewed the need to make provisions to partially test the fire protection system. The reason for need of partial tests is so that as installation proceeds on up in the building fire protection piping releases can be given and ceilings and other work which depends upon completion of fire protection testing and proceed. This matter should be investigated thoroughly to insure that the testing requirements are not such that they will slow work at the floors.

Tunnel finish work is being used as fill in with plastering complete and sheet metal duct work just starting.

At the basement mechanical equipment room, work is moving well, and it is expected that within the next two months it will be possible to test out the system.

Plaza level work

As of June 24, 1980 (working day 633) work is moving well on installation of curbs and sidewalks. Sand fill and insulation is substantially complete at all areas of the plaza. No precast pavers have been set as yet.

Marble is expected to begin arriving on the job in early August, 1980. In our previous logic, we had assumed that marble should be erected to begin lathing for plaster at the soffit ceiling. However, a different sequence has been devised and lathing has already begun on soffit ceiling areas. Plastering is expected to begin momentarily.

At the interior of the building plaza level lobby sheet metal duct work is well along as is mechanical piping and sprinkler piping. The electrical strike has delayed the beginning of rough electrical work at the lobby but work will begin shortly.

Lobby catwalk installation is due to begin sometime this week although there is no current word on delivery of the catwalks. To be particularly watched is installation of curtain wall.

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Erection of brackets was due to begin no later than May 16, 1980 (working day 607). These have just arrived on the job. The important element here is that we are striving to close in the lobby area prior to the onset of cold weather. Our target for close in was October 20, 1980 (working day 715). The delay to a delivery of the brackets could revise that to a later date.

Fourth floor (sheet #11)

The lag at the fourth floor is currently about 20 working days primarily in installation of above floor rough work. There also are conflicts according to the project staff between sheet metal, lighting fixtures, and sprinkler piping. This interference problem is presently being addressed by the owner, the architect engineer, and the contractors involved to insure that the rough work can be properly installed above the ceiling.

Typical floor core 5th through 22nd

The largest lag measured against the Issue #10 network, dated February 18, 1980 (working day 543) is about 70 working days at the 6th floor. This lag is over a desired target for each floor using the turnover cycle of ten working days. It is important that the turnover cycle be maintained so as not to encourage a late buildup of manpower that cannot be met. Therefore, it is the intent and desire to set the completion for each floor at the date established as the normal early finish date using a turnover cycle of ten working days. Measurements at upper floors are from a set of dates obtained as described above.

The current lags at succeeding core areas on up in the building are smaller although actually the 70 working day delay will be projected over the entire building since the project is now sequenced to move from floor to floor.

Much of our discussion today centered upon methods of recapturing time by using additional crews. We made several extensive turnover cycle analyses to establish what manpower levels would be required, and how the building could be broken into multiple crew areas. Mr. Rogers will make a review of this problem with his sub-contractor superintendents and set a reasonable approach to meeting dates to be established as desired targets for completion of each floor. Strong efforts are also to be made over the next two weeks to establish a desired target date by which Kraus-Anderson and all other contractors will be totally complete with the job.

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CONSULTING ENGINEER

Typical tenant area floors 5 through 22

Tenant area work was subjected to the same general analysis as described above for the core areas. Work in tenant spaces also lags, the largest being at the 6th floor where work is presently about 67 working days behind target late starts and finishes. Mr. Rogers will also discuss tenant space work in conferences with his sub-contractors.

General summary

Overall, the project is experiencing serious start up delays after the electricians' strike and this, in turn, is causing delays to following work, most particularly installation of drywall. Our job now is to re-analyze the project in a meaningful fashion, set realistic completion dates, and then establish a positive and sound method of meeting the dates. In that sense, I have recommended that re-issue of the network model be deferred until we have acquired enough authentic information to insure that the dates being set for each and every element of the project can actually be achieved. I shall be in touch with Mr. McQuade shortly to set the next monitoring session.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Bruce McQuade

cc: Mr. Dean Winquist
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

August 4, 1980

Subject: Monitoring Report #13

Northwestern National Life Insurance Building

Minneapolis, Minnesota

Kraus-Anderson of Minneapolis Construction Co.

Project: 78:37

Date of Monitoring: July 29, 1980 (working day 657)

Monitored from Issue #10, dated February 18, 1980 (working day 543)

Note: The Issue #10 network model dated February 18, 1980 (working day 543) sets a completion target for the entire project of January 26, 1981 (working day 782). A new issue has been prepared, Issue #11, dated July 14, 1980 (working day 646). In this new issue the target of January 26, 1981 (working day 782) remains the same.

Approximate start of field construction: June 19, 1978 (working day 119)

Contract target date for completion: October 1, 1980 (working day 702)

Note: The manner of time extensions should be pursued vigorously since we are rapidly approaching the contract target completion date for the job of October 1, 1980 (working day 702).

Working days remaining to January 26, 1981: 125

Actions taken:

- Inspected project
- Reviewed current job status with field and office project team
- Prepared revised network model for owner at typical tenant floor
- Prepared partial ES/EF slant chart schedule for typical floor owner's work
- Evaluated current project status

General

Because of the difficulty in resuming full production following the electrical strike the job has had difficulty in regaining momentum. To take into account the strike's effect along with reflecting the need to review the current status of the work, a revised network model was prepared by the project staff , Issue #11, dated July 14, 1980 (working day 646). However, because this model was not fully available during the early phases of the monitoring we evaluated the project in this report against Issue #10, dated February 18, 1980 (working day 543). This issue has the same target completion date as that of Issue #11 and although the evaluation is not totally the same as it would be measured against Issue #11 it still serves to point out the various critical areas that must be focused upon.

The Issue #11 network presumes that work on the building at the typical floors will move consecutively from the 5th through the 22nd, and that the turnover cycle per floor at both the core and the tenant areas will be maintained at five working days. This is a very short cycle, particularly since the core and the perimeter areas are now to be worked upon concurrently.

In addition, of course, there are other areas of the building which also must be completed during the same period of time. These include the interior of the sub-basement and the basement, the interior of the main lobby including the east and west wings, the interior of the 4th floor, and exterior work at the plaza both within and outside of the building line. Equally important is the need to concurrently complete installation of equipment rooms at the basement to provide tempered air in the building by early fall, 1980.

If we are to maintain a five working day turnover cycle on the core and typical owner tenant areas we must immediately gear up for this effort. Part of our work today consisted of redlagramming the owner's work at the typical tenant space. This plan is shown on sheet TA, Issue #12, dated July 29, 1980 (working day 657). The network model was started from a base date of zero and included all of the items that would have to be installed in the tenant's typical space and constituting owner's work. It appears it will require 36 working days on a floor where the least amount of work has been done. None of the tasks except sheet metal duct work and ceiling light fixtures require more than 5 working days. Therefore, we made our turnover cycle for this work in the amount of 5 working days and where multiple crewing is required for duct work and light fixtures we are assuming such multiple crews can be provided by the contractors doing the work.

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To provide a graphic depiction of the work involved we began preparation of a slant chart early start/early finish schedule for the typical tenant floors. Due to the press of time, we were not able to complete this schedule but it was left with Mr. McQuade for further reference and work. I suggest the slant chart be completed for typical tenant spaces as well as for the core areas and that separate sheets be used to show both an early and late start and finish schedule. This will then allow day by day monitoring of the schedule against progress in the field. It was decided at our session that such day to day monitorings will be carried out by Mr. Rick Bickert. He will use the network models to color code and identify trends, and will use the translations from the models (slant charts) to identify the desired current position of the project compared to the actual status.

My evaluation of work on the job indicates that if some rigorous conditions are met over the next two months we could hit the target completion date of January 26, 1981 (workin day 782). However, it will call for constant, detailed attention to each area and prompt resolution of each and every problem that appears. The turnaround on problem solutions has been improving recently partially due to the intense attention the job is getting and also to the fact that we are now moving into final phases of construction. However, this attention will have to be given on an even more concentrated basis to meet the current completion date.

The various activities we are working on are owner work and there is an obligation to clean up and make whatever corrections are necessary according to specified punch out procedures. At completion, the floors will be secured and Kraus-Anderson will move out of the area. Presumably at that point the floor will be available for tenants to move into the space.

I suggest that space allocation for tenants including owner space be initiated just as quickly as possible. There has been some confusion about which floors the owner wishes to occupy, with present conjecture indicating they will move into the 18th, 19th, 20th, and 21st floors. If this is the case it is entirely possible that the present sequence which moves the trades on up from the 5th floor is going to have to be changed to accomodate early demands for a move in. If this is to be done it should be decided upon within the next two weeks since within that period of time an intensive effort is to be made to re-align the work forces in a directed, focused effort to move from 5 through 22 in that order.

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We also inspected the lower mechanical room areas, and work progress there over the past month has been excellent. There still will be some difficulty in completing this work in time to turn on the system for cold weather. Nevertheless, if progress can be maintained as evidenced recently it is possible that this completion target can be realised.

Another problem that certainly will be brought into sharp focus soon is finish work at the lobby. There have been delays to marble deliveries, and this in turn has caused concern over the possibility of completing these areas by the target of January 26, 1981 (working day 782). The work there is complex, deliveries of materials required is of a long lead time nature, and the finishes themselves are such that the area has to be kept relatively clear of other construction traffic so as to avoid damage to materials in place. Mr. McQuade said that one of the assurances given by both the plasterer and the marble installer is that if multiple crewing is required for the work at the lobbies they will be available to adequately man the job to meet the current schedule.

As we discuss the target completion of January 26, 1981 (working day 782) we should constantly keep in mind what that date signifies. The intent is that Kraus-Anderson by that date will have in the main completed their work for the owner. Of course, certain areas, for example, some of the typical floors will possibly have been completed prior to that. Once a floor is complete, punched out, and acceptable, the floors will be closed to traffic and will await tenant improvements to begin. This is why it is important for NWNL to identify who is to occupy what space so that design of these spaces and the consequent work which must be done in the space prior to tenant occupancy can be started as early as possible. I am certain that this is desired by all parties concerned.

Therefore, January 26, 1981 (working day 782) is the date of completion of major Kraus-Anderson work for the owner. The sub-contractors have generally agreed to current plans of operation and what is demanded now is an increasingly higher level of management attention from both the office and the field forces. It would be well to assess tenant space needs on an ongoing basis with the owner so as to insure close tie in by all parties involved of owner base building work and tenant work.

In summary, the project has now been brought to a point where to complete work from the 5th floor to the 22nd floor in a floor by floor movement it will be necessary to maintain

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independent 5-day turnover cycles for work at the core and the perimeter tenant space. This will be difficult to achieve and will require that certain key work be initiated within the next few days. Prime is completing chase in of tenant spaces so acoustic ceiling grid can begin. Hard ceiling work must be initiated also just as quickly as possible. In addition, the floors must be kept spaced out on the work cycle. These matters were all discussed in depth at our sessions and if the execution of the present plan can be carried out properly we should be able to meet the target despite its tight nature.

One of the elements that should be mentioned and kept in mind is construction of the skyway interconnecting the buildings and running generally in a north-south direction. This skyway, which is being issued on a change proposal, involved extensive work on areas within the plaza. Therefore, it poses construction difficulties caused by a need to maintain access to the building through the main entry at the plaza. In addition, supports for the structure extend through the plaza level deck and will have to be installed very carefully while maintaining proper access to the structure. There are some skyway delivery problems that could extend this work well into 1981 and thus, it would be wise to evaluate this skyway construction carefully and its impact upon the use of the new building.

I shall be in touch with Mr. McQuade shortly to set the next monitoring session.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Bruce McQuade

cc: Mr. Dean Winquist
Mr. Jerry Svee