RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

May 26, 1978

Subject: Monitoring Report #1

Eden Prairie, Minnesota School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Mpls. - Construction Managers

Project: 78:28

Date of Monitoring: May 23, 1978 (working day 101)

Actions taken:

- Conferred with Mr. John Williams, Mr. Robert Copeland and Mr. Dave Thies re current job status
- Discussed packaging and issuance of contract documents
- Reviewed possibilities of staggered construction
- Outlined suggested course of action for elementary and high school planning and scheduling procedures

General Summary

The Eden Prairie construction program consists of revisions and additions to a small elementary school, the construction of a new high school and energy retrofitting of educational facilities in Eden Prairie, Minnesota.

Presently contract documents are being completed for the elementary school and design/development drawings are being readied for presentation on the high school. Kraus-Anderson's role in these programs is as a construction manager. In this meeting we reviewed activities that Kraus-Anderson of Mpls. could best conduct over the next few months, particularly in relation to planning, scheduling and issuing of contract documents on the total project.

A brief review of each project is given below.

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Elementary School

Presently contract documents are being completed and it is expected they will be ready for issue June 15, 1978 (working day 117). There have been some revisions suggested and therefore, it is not certain that this date is firm. From our discussions it appears it might be more accurate to assume a conservative date of July 3, 1978 (working day 129) or slightly later.

Once contract documents have been completed, it is anticipated proposals will be received from several prime contractors being considered with a contract awarded sometime in late July or early to mid-August.

From a brief review of the proposed scope of work, I recommend several tasks be approached by Kraus-Anderson over the next few months. These are discussed below at random and are lettered for reference ease.

A. Since contract documents are to be issued complete, contract packaging for staggered construction starts will not be necessary. Therefore, I recommend Kraus-Anderson generally group prime contractors similar to those projects upon which Kraus-Anderson is themselves the single prime contractor.

B. It would be helpful and encourage good proposals if remodeling work and the existing building configuration and materials are more clearly shown in reference to each other. This has already been done to a limited extent but I suggest the Kraus-Anderson project staff make a thorough review of the documents and recommend further clarifications as they feel appropriate.

It is found in remodeling work that a major source of confusion during both the proposal and the construction periods is what the existing facility looks like compared to what is proposed in the work.

C. Prior to release of contract documents for solicitation of proposals, I recommend Kraus-Anderson prepare a summary network model to establish important milestone points on the project. This document should be assembled to identify fundamental construction movements throughout the project. The summary diagram should not be made a part of the contract documents. However, key target dates selected from the network can be made a part of the contract documents if so desired. The summary diagram should be given to various proposing contractors for information only.

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D. Since there will undoubtedly be conflict difficulties as remodeling work is done while certain of the adjoining facilities must be occupied, I recommend that Kraus-Anderson in conjunction with the school staff plan a sequence of remodeling movement through the job that can be identified to the various contractors involved prior to submission of proposals. A clearly identified flow of work will generally result in getting better proposals for the work. It also encourages better prepianning of the field work once the job is underway.

E. Normally in remodeling work it is most effectively done if large spaces are turned over to the contractors. Therefore, the areas to be turned over for remodeling should be made as large as is functionally possible while still maintaining proper ongoing school functions. Probably because of the timing of this project it will not be possible to do all remodeling work over the summer vacation, therefore, it can be expected that school will be occupied during a portion of the remodeling period. The time for planning for this is now.

F. An important item in schools during progressive remodeling is constant maintenance of fire exits. Fire passages and fire exits must be meticulously thought out and maintained. It is best to review this matter in detail prior to solicitation of proposals so make-shift and expensive arrangements are not necessary at a later date.

G. At a pre-bid meeting it is wise to encourage the contractors proposing on the work to walk through the facility. This should be done in conjunction with the architect/engineer, the owner and the construction manager. This walk-through should encourage asking questions that deal with matters of access, mobilization, sequencing and other such high expense field operations that influence costs.

H. It should be mentioned in the general requirements that once contracts are awarded, the prime contractors will be expected to participate with the construction manager, the owner and the architect/engineer in preparing a detailed construction network.

This would be a mutually prepared document and one acceptable to all parties.

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I. The principal of the school should expect to be an active participant in the remodeling process since in school remodeling, the need for daily, on-site decisions that affect school operations is generally great. Therefore, he should be as familiar with procedures and the construction administration process as possible.

It also will be important for the architect/engineer to play a positive and constructive role in expediting shop drawings and in making prompt field decisions that affect work in progress since quite frequently these decisions are not possible to make earlier than the difficulty is uncovered.

High School

As of May 23, 1978 (working day 101) design drawings are being readied for presentation in mid-June. It is expected to start preparation of contract documents about mid-June and these should be complete by mid-January 1979.

Because of the peculiarities of the school year and the times at which schools can be occupied by student bodies, it would be wise to plan this job to optimize the construction period throughout which it is to extend. For instance, it might be appropriate to consider preparing a substructure and possibly a superstructure package to issue early so construction could begin in the fall of 1978. Thus, foundations could be installed during good weather and it might even be possible to erect some of the superstructure during the early winter months. The project would then be ready to start on superstructure, exterior skin and interior rough work by early spring of 1979. This should allow close-in of the building by fall of 1979 and possibly, if acceptable to the owner, partial occupancy by January or February of 1980. This kind of planning is essential to start now so proper preparation of the working document package can be set early.

We also discussed the packaging of working documents for progressive issue and staggered construction. It is important to remember when packaging, it is essential that all related items be released along with it. This might require issuance of mechanical and electrical drawings as well as miscellaneous metals that are attached or imbedded with the structural frame package. When considering packaging, it is usually best to reduce to a minimum the number of packages to be sent out.

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When a package is released containing certain trades, it is usually necessary to release additional drawings for information only. Sometimes this becomes a difficult delineation process and oftentimes results in gaps in the estimates and proposals. One of Kraus-Anderson's major responsibilities as a construction manager will be to insure that such gaps are eliminated.

It would be wise at an early session to prepare a summary diagram of the proposed high school. This would be of considerable help in establishing major seasons across which the construction work is to proceed. It will also allow an evaluation to be made as to when portions of the building could be available for occupancy. It is generally important in schools to finish the project at a time when the school can be taken over and occupied by the owner.

If construction is completed and the owner is not able nor willing to take over the facility, serious difficulties can arise. These should be averted early in the project through clear understanding and good planning. Thus, as noted above, it would be wise to do some early summary diagramming of the intended facility. I shall discuss this matter with the project team in succeeding sessions.

General

Overall, the current status of the work on the elementary and high school looks to be in good shape. The next few months will be critical to both jobs to insure they are put into the field in proper manner and it is an excellent opportunity for Kraus-Anderson to show their true abilities as construction experts.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. Dave Thies
Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

June 19, 1979

Subject: Monitoring Report #1 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - Construction Managers

Project: [redacted]

Date of Monitoring: June 18, 1979 and June 19, 1979 (working days 373 and 374)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: - desired September, 1980
- probable February, or March, 1981

Actions taken:

- Continued analyzing floor pour sequence and form requirements
- Completed network through general close-in
- Monitored progress on sub-structure work
- Reviewed, in detail, activities to be conducted over the next three months

General summary:

The major participants at this two-day session were:

Mr. John Williams, Kraus-Anderson
Mr. Roger Johnson, Kraus-Anderson
Mr. Lyle Lundquist, Shaw-Lundquist
Mr. Bruce McQuade, Kraus-Anderson
Mr. Mike Sikorski, Kraus-Anderson

part-time - representative of Ceco

On the site, mass excavation is substantially complete and filling and compacting of poor soil areas along column lines 18 and 1 is also complete. Wall and column footings are being built with columns and walls

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to the second floor to start June 22, 1979 (working day 377). This sequence should allow forming of the first deck (pour A2) at the second floor to be started July 5, 1979 (working day 385). In order to begin work on supported decks it will be necessary to have form work, shoring, pans and resteel available. There only is a very short time to get ready and mobilize and every effort must be made to expedite early front end slab needs.

Reinforcing steel shop drawings for the first deck will be submitted shortly and if steel is to be fabricated in time for it to be on the job as needed there will have to be daily attention given to early deliveries.

It is expected that forming of the concrete supported decks will be done on a 3-day turnover cycle; that is, every three days a new deck will be started and every three days a pour will be made. The first pour on deck A2 is expected to be made July 26, 1979 (working day 400). If a pour is made every three working days following, completion of the structural concrete frame will be by early December, 1979.

We made an in-depth analysis of pan and centering requirements for the job. This was shown on the bar chart B1, Issue #2, dated June 18, 1979 (working day 373). In this analysis, we showed the length of time that centering, and 12 and 14 inch pans would be tied up in the deck for each of the deck pours.

A preliminary evaluation indicates that the peak demands of the job will exceed the amount of form work presently to be provided. This is a very serious problem to address immediately, since if the amount of form work apparently needed is not provided, the turnover cycle will increase. It should be kept in mind that a one-day increase in the turnover cycle will delay total construction of the entire structural frame by 33 working days. Any additional increase in turnover cycle will reflect itself in an even later date.

The problem here of course is that the finishing of the deck is, as now scheduled, in early December, 1979, which probably will run into some early cold weather. Any extension will increase the chance of losing sizable amounts of time to cold weather and also will require considerable temporary heat for the floor pours. Thus, expediting the start of floor pour work is absolutely imperative.

Mr. McQuade is going to make a further analysis of the sequence of pours to see if the pan and centering use histogram can be leveled out at a lower peak demand. Present indications are that this may be quite difficult to do; however, it must be attempted.

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Also discussed relative to the concrete work was pouring of the floor slabs on grade. Presently, plans are to do the floor slabs on grade at a later date once shoring has been stripped out from each area. I recommend a study be made to see if there are any areas where floor slabs on grade can be started before floor pours above are begun.

The next review was an evaluation of exterior masonry erection and closing in the building with structural steel framing insulation and roofing. The present intent is to begin early masonry, by elevation, on the gymnasium, starting at the southeast corner. Masonry work on the exterior perimeter will proceed in a counter-clockwise direction on the gymnasium, moving next to the auditorium, and then to the kitchen and boiler house.

Once masonry has been completed on the exterior to the southwest classroom point, the mason will move back to the east elevation and do the southeast and then the southwest classroom building. In general masonry will be erected by elevation.

At the gym and auditorium, once bearing masonry at the perimeter has been completed, erection of structural steel, joists and metal deck can be done. This will be followed by insulation and roofing.

Much masonry erection is presently anticipated as winter construction. It is the intent of the masonry contractor to provide adequate temporary heat and protection so masonry can proceed through the winter months.

There is a possibility that it might be better to begin masonry erection at the auditorium and work clockwise around the building. This will be studied in more detail over the next few days. Again, as with the structural decks, it is important to decide early on how masonry is to be started because of the fact that erection of masonry will begin some time within the next two months.

With our present plan of work, close-in of the various areas of the building can be expected on a staggered basis from dates ranging from January, 1980, through to the end of March or slightly later, 1980.

The building breaks into several major interior rough and finish work areas; these include:

Lower gym facilities (LG)
Gymnasium (GY)
Auditorium area (A)
Auditorium support area (AS)
Food service area (FS)
Boiler room (BR)
Classroom areas (C)

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Further breakdowns of space identification will be made as we begin planning the interior finish work. If, in the building, rough, mechanical, electrical and architectural trades can begin soon after the decks are poured, stripped and reshored, the close-in points presently identified should allow finish work to begin when the close-in point is reached.

Following total close-in of the building, each area will be worked on and turned over on a steggered turnover sequence. It appears with present information that occupancy of the facility could be sometime early in 1981. It would not be wise at the present time to plan for an August, 1980, occupancy, since much will depend upon how well we are able to construct the structural frame and close-in work prior to the onset of cold weather this year.

It should be noted that there are some contract expiration dates in 1980 that may affect the project. Those discussed so far have been the electricians, plumbers and fitters and sheet metal workers. At the point of their contract expiration probably all of these trades will be heavily involved in work in the facility; therefore, the potential for work stoppages must be considered in planning for occupancy of the facility.

Evaluating front end procurement activities that should be in work, I suggest the following be given special attention:

- Approval, fabrication and delivery of early supported deck resteel (high priority)
- Delivery of masonry
- Delivery of hollow metal frames
- Delivery of all built in miscellaneous iron items
- Fabrication and delivery of skylight materials and glass
- Resolution of amount of form work to be provided
- Planning of floor pours for slabs on grade
- Selection of color and delivery of hard tile
- Completion and provision of color and finish schedules, as needed
- Provision of food service rough-in drawings
- Detailing, approving, fabricating and delivery of food service equipment
- Delivery of toilet partitions.

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There are undoubtedly many more critical early deliveries including mechanical and electrical equipment items. I have recommended to Mr. McQuade and Mr. Williams that they make a detailed list of all procurement needs and this then will be incorporated into our continuing network modeling. We shall continue to monitor and evaluate the job on our current plan of work, which is Issue #2, dated June 18, 1979 (working day 373). Copies of the network model prepared today will be distributed by Mr. McQuade to those concerned.

Ralph J. Stephenson, P. E.

RJS:jc

To: Mr. Bruce McQuade (ORIGINAL)
Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

July 31, 1979

Subject: Monitoring Report #2 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - Construction Managers

Project: 79:41 (formerly 78:28)

Date of Monitoring: July 23, 1979 (working day 397)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: Original desired - September 1980
Probable - February 1981

Actions taken:

- Monitored current status of project
- Reviewed close in networks with Mr. Shaw
- Diagrammed interior slab on grade work
- Discussed and identified start up points for interior rough work
- Made preliminary projections for completion of finish work from close in points.

General Summary

As of July 23, 1979 (working day 397) there remains about 15 working days to complete all interior and exterior wall and column footings and most concrete walls and columns to the second floor. Erection of form work for decks A-2, B-2, K-2, C-2 and L-2 is in work with the first pour on A-2 expected to be made July 24, 1979 (working day 398). The target date for this pour in the Issue #2 network, dated June 18, 1979 (working day 373) was July 26, 1979 (working day 400).

It is expected that pour B-2 will be made on Friday, July 27, 1979 (working day 401). Its target date was July 31, 1979 (working day 403) in the Issue #1 network.

Thus, construction of the second floor supported deck is about two working days ahead of the early starts and early finishes projected in our initial network model.

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The detail analysis made of the amount of centering, 12" pans and 14" pans required on the job, and shown on Sheet B-1, Issue #2, dated June 18, 1979 (working day 373) has been reviewed in depth by all parties concerned, and assurance has been given that adequate form work will be available to meet the pour schedule shown on Issue #2, Sheets 2,3, and 4, dated June 18, 1979 (working day 373).

We next made an evaluation of the advisability of pouring floor slabs on grade as early as possible. It was decided that the slab on grade at the boiler room would be constructed early followed by construction of the boiler room roof deck (previously pour J-3, now revised to pour N-3). This will give a slab on grade and cover slab early enough to permit work to proceed in good fall weather on installation of mechanical equipment and piping at the boiler room. Most other slabs on grade have been planned to be installed following construction of second floor decks.

It is anticipated that underground utility work in most areas can proceed as soon as the second deck has been stripped and reshored with the slab on grade to follow. However, early underground utility work is expected to begin at the boiler room area on August 1, 1979 (working day 404) and proceed from the boiler room into the kitchen, and then as space is available, down into the classroom area and back into food preparation. The mechanical underground constructor and the deck pour constructor will work together to minimize construction interferences.

It was also decided at our meeting that the slab on grade at the lunch room which has an exposed aggregate surface will be delayed until it can be installed with minimal potential for surface damage.

We next reviewed the close in sequence with Mr. Shaw and later in the day with Mr. Lundquist. The close in diagram is shown on Sheet #5, Issue #3, dated July 23, 1979 (working day 397). In this plan of work, it is expected that erection of masonry at the gym east elevation will begin about September 4, 1979 (working day 427). Masonry erection will proceed from the gym east elevation to the gym north elevation and then to the west elevation from where it will proceed to the auditorium, kitchen and boiler room.

There is a possibility that boiler room masonry will be erected early if it can be done without disrupting the major sequencing. This should allow boiler room interior work to continue through cold weather.

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Erection of masonry is expected to be continuous from its beginning in September on through to completion in early March 1980. Erection of masonry is expected to carry through the cold weather months.

Exterior masonry at the south east classroom will begin about November 20, 1979, moving to the southwest, and finishing sometime about mid-March 1980. Thus, there will be concurrent erection of classroom masonry and other exterior masonry to the north and east.

Overall, the present target for classroom close in is about April 1, 1980 (working day 574). Efforts will be made to close major sections of the building, such as the locker room areas, gym, auditorium and auditorium support areas, food service areas and boiler room at earlier dates to allow interior finish work to begin as soon as possible. Presently, however, we are assuming that the classroom building close in date is the point at which the building will be generally weather tight.

Sash and glazing at the classroom have yet to be inserted into the network model, but temporary opening closure will be provided if required.

As part of our diagramming we began preparation of an early procurement diagram, shown on Sheet D-1, Issue #3, dated July 23, 1979 (working day 397). This network will be expanded in subsequent sessions to include all major delivery items. In it the full procurement process will be shown for all critical and potentially critical items.

At present, the most important delivery element is a constant supply of resteel to the job for the supported decks. The projected pouring sequence, one each three days, requires that resteel be provided on an ongoing basis to maintain the pace. Apparently, the project staff is confident that resteel can be provided as needed.

We met with the mechanical contractor in the afternoon to review installation times for their major rough work. To identify this work in depth, we broke the building into several areas. These are listed below:

LG - Lower gym

G - Gymnasium

A - Auditorium (Column lines 8-13)

AS - Auditorium support area (Column lines 4-8)

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FS - Food service area

CR - Classroom Area (The classroom is broken into the southeast and southwest quadrants for each floor. The southeast quadrant on the first floor is CE-1). Other quadrants are similarly designated.

BR - Boiler room

Fan room 401

Fan room 331

Fan room 332

Fan room 355

Once these areas were identified, we then made a preliminary time estimate with the contractors to establish durations of sheet metal duct work installation and mechanical piping work. The reason for this was to indicate when, after a certain space was available, completion of rough overhead could be expected to allow finishes, generally ceilings, studs, painting and board work to begin. These tabulations are shown on sheet T-1. Preparation of this table will be continued in future meetings to obtain durations for all major contractor work to guide us in preparation of detailed interior diagrams.

After our discussion of the close in areas and the points where floor slabs would be available, it was decided that the sequence of rough interior work would proceed as follows:

Start at lower gym (LG) and move to

Classroom southeast #1 (CE-1) to

Classroom southwest #1 (CW-1) to

Classroom southeast #2 (CE-2) to

Classroom southwest #2 (CW-2) to

Classroom southeast #3 (CE-3) to

Classroom southwest #3 (CW-3)

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Concurrent with the above work, boiler room work (BR) will proceed as the area is available. Also concurrent with the above work will be the sequence with the gym (G), auditorium (A), auditorium support area (AS) and food service (FS). This rough interior installation will proceed in the order noted above.

Major projections were made of the expected work pattern and it was found that preliminary target completion dates could be identified (subject to further evaluation and review). Overall, it is anticipated that the classroom building might be able to be completed in December 1980. Allowing another full month to turn over the project and taking into account that December is a difficult construction month brings anticipated completion of the project to late January or early February 1981. Projected completion dates for other areas are staggered throughout 1980 and these dates will be established as work proceeds in the field.

We will plan to use the above targets to measure our detailed planning work in subsequent session.s

Thus, at present, the work pattern for the next year to year and one-half has been set and conveyed to major sub-contractors (except for the electrical). They are now reviewing the discussed sequences and targets and will confirm or revise the data shown in our preliminary network models.

At our next session, we should have a better feeling for the floor pour progress and at that time can make a final review of the close in network and complete remaining pour sequences.

There are two floor pours yet to be shown on the diagram. One of these is at the M-3 area to the rear of the auditorium. This is a supported deck over the toilet rooms. The other slab is at the fan room 401 roof.

Also, the slab on grade at the auditorium and auditorium support area is yet to be diagrammed. This is a complex sequence and it has not been possible to date to give it the attention it will require to insure proper planning.

This area will be important in that an early decision should be set as to how scaffolding for overhead work at the auditorium is to be handled. This item is presently being studied by Mr. Williams, Mr. Jhhnson and the contractors.

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In summary, the project is currently meeting floor pour early start/early finish targets. There is a slight delay tending toward late starts and late finishes in foundation work. However, this is presently not causing any major delays to the supported deck sequence.

Assurances have been given by the concrete contractor that the floor pour turnover sequence of one pour every three days can be met and our planning presently is based upon that delivery schedule.

Close in of the building is expected to be complete early next spring and installation of interior finish work will proceed following close in and installation of rough mechanical and electrical work.

Ralph J. Stephenson, P.E.
Ralph J. Stephenson, P.E. (sps)

RJS/sps
cc: Mr. Bruce McQuade (original)
Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

August 21, 1979

Subject: Monitoring Report #3 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - Construction Managers

Project: 79:41

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

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: February, 1981

Actions taken:

- Monitored current job status
- Prepared interior network models for classroom building, lower gym (locker area), gym and a portion of the auditorium
- Reviewed use of scaffolding at the auditorium

General Summary:

As of August 21, 1979 (working day 418), five floor pours have been made with two additional to be made this week. We were due to have the entire east half of the building (pours A2, B2, K2, C2, L2, D2, N2 and M2) complete by August 27, 1979 (working day 422). All pours except N2 will meet this date. There is a temporary shortage of 16-inch pans which will force N2 to be poured in two sections. Efforts are being made to acquire additional 16-inch pans.

A slight change in sequence has been made due to revised delivery schedules by the reinforcing steel fabricator. Originally the intent was to move to the southwest section at the second floor after completing the southeast section. However, the pattern now, because of this resteel problem, is to make the next pours above those areas already constructed in the southeast area. When resteel arrives for the southwest second floor, work will shift back to the southwest quadrant.

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CONSULTING ENGINEER

The lag in floor forming and pouring is presently two to four working days. This is a loss over the previous monitoring status and shows a slight trend toward lags that must be reversed quickly, otherwise we could have problems in completing the structural frame prior to early cold weather. Assurance still is given by the concrete contractor that the cycle of one pour each three working days will be met or bettered.

Foundation work continues, primarily at the north side of the building. Heavy efforts are being made to complete the foundation walls along column line H so they can be backfilled and footings for the auditorium and auditorium service areas completed. The question was raised about early backfilling at this wall, and Mr. Johnson will check into the bracing conditions that must be met.

It is estimated there are still another 15 to 20 working days remaining to complete all footings, foundation walls and basement walls for the total project.

Underground utility work has begun and good progress is reported in installation of major piping at the food service area and the southwest and southeast portions of the classroom area. As soon as the gym floor is stripped and reshored, utility work at the locker room will begin.

It was pointed out during our session that it is important to complete underground work at the boiler house so the slab on grade there can be poured prior to construction of the supported roof deck. The reason is that at our previous session it was decided that with a slab on grade and a cover slab completed early enough to permit work to proceed in good fall weather, we could better expedite installation of the boiler room and its equipment.

Interior work

Our major planning efforts at this monitoring consisted of preparing network models for the six classroom sections and the lower and upper gym areas. Some work was also done on the auditorium house area, but this network model remains to be completed.

Projecting from these networks, it appears that we can hold a completion target for the classroom areas of December, 1980, with turnover in late January or early February, 1981. Thus, the tentative targets reported in monitoring report #2, dated July 31, 1979 (working day 403), still apply. It is important to understand that to hit this target, the work prior to cold weather must be carefully sequenced and managed. Thus, it is essential that as soon as supported decks are poured, cured, stripped and reshored, work on floor slabs on grade proceeds immediately.

We based our interior planning for the classroom area on a sequence moving from the CE1 (classroom, southeast quadrant, floor 1) to CW1, then to CE2 to CW2, to CE3 to CW3. Presently, we are sequencing the floors so as to maintain a turnover cycle of approximately fifteen working days.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Mr. McQuade and Mr. Johnson will complete assigning durations and calculating the network models for the six classroom sections. These then will be issued for review with the various contractors on the job. not done

At the lower gym area (LG), it is expected to start above floor sheet metal, piping, sprinkler and electrical work when the floor slab on grade has been poured out. Once the building is closed in interior finish trades, initiated by application of the floor hardener, will start.

At the gym area proper, work will begin as soon as the roof steel and metal deck is installed. Interior finish work there will begin after closing in of the upper gym area.

At the auditorium, we again reviewed the need for considering whether a common scaffold was to be used in the auditorium house area (AH). The house area is the seating area of the auditorium. Several considerations are important. These deal with who is to erect the scaffold, maintain it and dismantle it. Also of interest is the method of sharing cost for the scaffold. Mr. Johnson is to consider this matter in depth over the next month and will work out a procedure with the contractors. not done.

It is possible that work could proceed without a common scaffold, but the shared scaffold might be more economical and effective than individual scaffolds in pursuing work at the upper auditorium area.

The scaffold can either be supported from below or hung from the roof, if allowed by the structural engineer. If a hung scaffold is desired, this would allow work to continue below; and the scaffold could be maintained independent of the condition of the floor slabs and supported decks below the work area.

During our auditorium diagraming, it was noted that the floating acoustic clouds are very large and early consideration should be given to the method by which these are to be fabricated and put into place. Their size makes it desirable that the installation method be carefully defined at an early point in the job. ok.

At this meeting we were not able to diagram the food service areas or the auditorium support areas. However, attention should be given now to procurement of food service rough-in drawings so underground utilities and subsequently the slab on grade can be constructed there as early as possible. Also, shop drawings for food service equipment should be expedited since this equipment is nearly always a long lead time item.

At our next planning and monitoring, we should complete diagraming remaining auditorium areas, auditorium service areas, and the food service section. Of prime importance at that session will be the preparation of a procurement diagram showing shop drawing submissions and the fabrication and delivery plans for all major long lead time items.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

A decision as to how to process the network model will be made shortly and the network will be issued officially. In the interim, however, prints will be made of the manually computed diagrams so that early study of the plans of work anticipated can be made.

Ralph J. Stephenson, P. E.

RJS:jc

Mr. Bruce McQuade (O)
Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

September 25, 1979

Subject: Monitoring Report #4 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - Construction Managers

Project: 79:41

Monitored from Issue #3, dated July 23, 1979 (working day 397)

Date of Monitoring: September 17, 1979 (working day 436)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: February, 1981

Actions taken:

- Inspected project
- Reviewed current job status with Mr. Bruce McQuade and Mr. Roger Johnson.
- Reviewed concrete floor status with Mr. Lundquist
- Evaluated current job status

General Summary

As of September 17, 1979 (working day 436) nine and one-half supported deck pours have been made. This is four and one-half more than as of the previous monitoring on August 21, 1979 (working day 418). The four and one-half pours have been made over a period of 18 working days or on a turnover cycle of about four working days.

Pours that have been completed are A-2, B-2, K-2, C-2, L-2, D-2, N-2, A-3, and half of D-3.

It is expected that the entire southeast quadrant at the third floor will be poured out by September 20, 1979 (working day 439). The early finish target date for this was September 21, 1979 (working day 440).

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However, the two pours in the southwest sequence, H-2 and E-2, that were bypassed to move to the third floor are just now starting. Therefore, the entire lag at present is the amount of time it will take to construct those two pours. This is estimated at about 16 working days to complete pouring the first pour with the second following in three days. Thus, the current lag is about 19 working days.

In conversations with Mr. Lundquist, he said the pour patterns have been revised so larger pours are now to be made. At the second floor, he has combined pour E-2 and a third of H-2, and G-2 and two-thirds of H-2. At the third floor, he has combined F-3 and a half of G-3, H-3 and a half of G-3, and has combined J-3 and K-3 into one pour.

At the roof, he has combined BR and one-half of CR, and DR and one-half of CR. At the southwest roof, he will probably retain the present six pours.

So, there is presently a total of three pours at the second floor remaining, four pours at the third floor, three pours at the southeast roof, six pours at the southwest roof and one pour a piece at the boiler room roof and at the auditorium for a total of 18 deck pours remaining.

Projecting these and using a 15 day time to prepare for the pour with a three and a half day turnover cycle indicates the pours will be completed by January 3, 1980 (working day 511). Our original target date for completion of all pours was December 12, 1979 (working day 497). This gives a projected lag at the end of the pours of about 14 working days.

Critical to floor pours is maintenance of a constant flow of resteel to the job. Presently, resteel is on the job for the southeast quadrant third floor and the southwest quadrant second floor. Shop drawings for the southwest quadrant third floor are to be submitted September 24, 1979 (working day 441). Shop drawings for the K-3 and M-3 slabs have just arrived, and shop drawings for the southeast roof will be available September 18, 1979 (working day 437). Southwest roof shop drawings will be submitted about October 2, 1979 (working day 447).

Thus, it can be seen that constant attention will have to be given to review and approval of resteel shop drawings along with delivery of reinforcing steel.

It was re-emphasized at our monitoring session that at the boiler house, walls, underground work, slab-on-grade and supported deck are very critical so as to get the boiler house closed in and available for work throughout the

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winter. The wet weather has caused some delays in installation of the boiler room footings.

It is expected, however, that work will be focused on the boiler house over the next two weeks to complete all footings and walls so grading and underground utilities can be installed.

At the auditorium, there has been some delay in getting proper elevations assigned to the structural footings. However, these have now been given to the field forces and footings are in construction.

No building slab-on-grade work has yet started. However, underground utilities are far enough along in the locker room area so that within the next two or three days filling and fine grading and perhaps some slab pours can be started.

It was re-emphasized that provision of slabs-on-grade is a desirable element relative to improving effectiveness of interior above floor work at lower floors over the winter. There was some question as to whether or not these slabs should be poured and left to sit over the winter period. This problem is now being studied by the field and office managers.

Overall, it is expected that within the next 15-20 working days all foundation work will be complete and all concrete and masonry foundation walls will be up to rough grade. It is also expected that slab-on-grade work will have begun, and that pouring out of the supported decks will continue in the same pattern as presently planned.

Interior masonry work has begun at the gym east elevation and is presently moving well. It does lag our anticipated start by 5 to 7 working days.

Presently the target is to erect gym structural steel by December 26, 1979 (working day 506). Most structural steel and joists are on the job for the gym and auditorium.

Some interior masonry has begun at the lockero room.at the stairwell areas. Underground utility mains are in in most areas. Branches remain to be completed.

It is again emphasized that rough in drawings for food service and food preparation equipment are extremely important. There is presently no word as to when these shop drawings and rough-in drawings will be available. I urge that immediate and continuous attention be given this item.

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Mr. Johnson mentioned it is also important to select a supplier and obtain rough-in drawings for lab equipment. This equipment is at the third floor of the southwest quadrant. Therefore, there is some time remaining although it is short, to get this information. If this information is not made available, coring will have to be used to make these openings. This is difficult since some coring may have to be done through joists. This matter is presently being followed by the architect engineer.

At our meeting, Mr. Johnson mentioned that lately Eden Prairie has had an unusually large amount of rain, both in frequency and intensity. This has tended to delay weather-sensitive work, particularly foundations and in some cases floor pours.

At this monitoring, we did not review the interior work in great detail. Mr. McQuade and Mr. Johnson will complete the network model quantification for the six classroom sections and we will, at our next diagramming session, complete diagramming those sections not yet prepared. This includes the auditorium support area and the food service area.

It is presently the intent to process this network model through the Kraus-Anderson in-house computer, and input will be prepared shortly. In the interim, the manually-computed network models, Issue #3, dated July 23, 1979 (working day 397) are being used.

Ralph J. Stephenson, P.E.

RJS:sps

Mr. Bruce McQuade (original)

cc: Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

October 23, 1979

Subject: Monitoring Report #5 (for construction)

Eden Prairie school expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - Construction managers

Project: 79:41

Monitored from Issue #3, dated July 23, 1979 (working day 397)

Date of Monitoring: October 16, 1979 (working day 457)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: February, 1981

Actions taken:

- Inspected project
- Reviewed current job status with Mr. Bruce McQuade and Mr. John Williams
- Reviewed progress expected over next several months with Mr. Copeland and Mr. Williams

General Summary

As of October 16, 1979 (working day 457) all second floor pours have been made with the exception of E-2 in the southwest quadrant. Pour E-2 is formed, the pans are set, and resteel is about to start.

At the third floor, the entire southeast section of the building has been poured out, and work is in progress forming pour E-3 and F-3.

Work in the southeast quadrant is just beginning on roof framing with some of the high shoring in place and with most columns poured out to the roof.

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CONSULTING ENGINEER

Measuring against Issue #3, dated July 23, 1979 (working day 397), second floor pours lag by about 16 working days at E-2. Third floor pour lags range from 14 working days at pour E-3 to 21 working days at pour K-3. These lags are over a target completion for all pours to be complete by December 12, 1979 (working day 497). The lag as of this monitoring is approximately the same or slightly greater than that noted in the previously issued monitoring report on September 17, 1979 (working day 436). The lag at that time projected through to completion was about 19 working days.

We were not able at this session to review the project with the field management groups of the construction manager or the concrete contractor. However, from discussions with the project staff, it appears that there is expected to be some difficulty in maintaining enough form area on the project to meet the projected three-day turnover which was established in the original pour sequence. This was slightly revised recently to increase the size of the original pours and to make the turnover cycle three and one-half days. However, at present, it may be that it will require increasing the turnover cycle even more, to five working days. The implications of this are that our presently anticipated date of January 3, 1980 (working day 511) which was projected at our last monitoring may be somewhat later.

This is a very serious turn of events since the difficulties of continuing concrete construction at a desired pace in winter weather becomes difficult. It is imperative that this building be worked on continuously so that our present target close in date of April 1, 1980 (working day 574) be maintained. It is the intent to re-evaluate structural frame progress along with following masonry and roof decks in a soon-to-be-held planning session.

Another element becoming very critical is construction of floor slab-on-grade. It has been the intent to construct the floor slabs-on-grade wherever possible, prior to the deck above being poured, and where not possible, to construct slabs-on-grade as soon as the area below is free. Presently, there is a sizable area of floor slab-on-grade that could proceed without interference from shoring of the decks above. However, no floor slab-on-grade work has been started as yet.

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This week, apparently, the concrete contractor will fill, fine grade, set in-floor work, and pour the slab-on-grade at the locker room under the gymnasium. Meanwhile, slab-on-grade work will proceed at the boiler room just as rapidly as possible. Again, as has been agreed, the boiler room will be built and closed in as soon as possible, and in any event, before cold weather so work on the mechanical and electrical installations there can proceed without delays through late fall and winter.

The matter of how much slab-on-grade is to be poured prior to the onset of cold weather is one that must be continually addressed since the provision of a hard surface from which to work and roll scaffold is very important to proper installation of above-floor mechanical and electrical work. This matter is being continually addressed during construction conferences.

Most foundation work is complete, and backfilling is proceeding at the auditorium and at the boiler room. Masonry is complete at the east wall of the gymnasium, has moved around the corner and is partially complete on the north gym elevation. It will now move on down the north elevation and soon will be starting at the auditorium area. Thus, this auditorium area should be made completely ready for masonry as early as possible.

The weather is beginning to turn cool, and it will not be too long before weather-sensitive construction operations may be difficult to maintain. Present expectations are that erection of masonry will be continuous on through to its completion in early March, 1980. Presently, masonry at the north gym elevation lags our target early starts and finishes by about 12 working days. It should be re-emphasised as it has been previously that it is the contractor's intention to work on erection of masonry throughout cold weather.

A small start has been made on installation of above floor rough mechanical and electrical work at the 1st, and very slightly at the 2nd floor. There is considerable area freed up for installation of rough mechanical and electrical work, and I strongly recommend that the hanging of sheet metal duct work, plumbing, and rough electrical above ceiling work be started just as quickly as possible. This, again, is a major reason why it is so critical to construct as much of the floor slab-on-grade in the very near future as possible. As noted in Monitoring Report #2, dated July 31, 1979 (working day 403), page 4, the intent is to do rough interior work starting at the lower gym area, moving to the classroom southeast, then classroom southwest, and from floor 1, to 2, to 3, in that sequence.

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CONSULTING ENGINEER

In summary, the project continues to slow in production of reinforced concrete decks. Of equal importance, however, is the need to get slabs-on-grade poured and to start an active pattern of rough mechanical and electrical above-floor work. We are still maintaining a target date for close in of the project by April 1, 1980 (working day 574) and to achieve this, it will be necessary to regain considerable amount of lag on the project.

Today is October 16, 1979 (working day 457), and we can expect that the weather will begin to turn difficult about mid-November, 1979. This gives us more or less another 4-6 weeks of good weather work. Maximum advantage should be taken of this time to insure that the job is brought as far along as possible.

Planning work for the project will be continued when authentic information is available about the intent of the concrete contractor to complete his work. At that point, we will complete preparation of computer runs for the network model.

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

Ralph J. Stephenson, P.E.

RJS:sps

Mr. Bruce McQuade (original)

cc: Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

February 9, 1980

Subject: Monitoring Report #6 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - Construction managers

Project: 79:41

Monitored from: Issue #4 and Issue #5, dated August 20, 1979 (working day 417) and January 29, 1980 (working day 529)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: February, 1981

Actions taken:

- Inspected project
- Reviewed project progress with Mr. Roger Johnson and Mr. Bruce McQuade
- Evaluated current project status

General Summary

As of January 29, 1980 (working day 529) all floor pours except at the entrance and balcony of the auditorium have been poured out. These two remaining pours will be done when masonry is complete in the area. The major share of main building decks was completed by mid-January. The boiler room roof deck is poured and now curing. The floor slab on grade is complete at the boiler house.

Rough interior work at the various areas of the project is moving as well as weather and job conditions permit. At the first, second, and third floors of the southeast section of the building sheet metal, mechanical piping, rough electrical, and sprinkler piping are generally hitting targets between early and late starts and finishes. It should be remembered that this area is expected to be ready to start finish trades by April 1, 1980 (working day 574). This is the date by which both the southeast and southwest classroom were to be roofed.

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Exterior masonry is substantially complete at the southeast classroom area and is partially complete at the southwest classroom area. There has been no further work done on masonry at the north and west side of the gym. Therefore, the gym area is completely exposed to weather and probably work there will have to be deferred until warmer weather. The auditorium roof also must be installed. This leaves these two major areas of the project to be closed in and completed at a later date than had been originally anticipated.

The key target for measurement of main building work progress will be the close in of the exterior of both classroom quadrants. Roofing is expected to start on the southeast quadrant within the next few days, probably by January 31, 1980 (working day 531). If roofing can proceed at both the southwest and southeast quadrants during this winter period, it is possible the areas could be roofed by our present target of April 1, 1980 (working day 574). Of course, we must have masonry complete at the southwest before being able to roof this area. Masonry on the main building probably will be complete within the next 20 to 30 working days.

It should be again cautioned that rough work inside the building must be brought up to a point where finish work can start as soon as the buildings are closed to weather if we are to maintain the anticipated progress.

The major lags in the total project, of course, now are at the gym and the auditorium. Although gym finish work is fairly straightforward, it is still a time consuming item and should be started as soon as close in occurs. At the auditorium interior finishes are fairly complex, and I suggest that close in there and at the gym be started just as quickly as possible.

Locker room areas under the gym are moving fairly well with most rough work complete. However, interior finish trades will probably have to wait until the walls, structure, and roof of the gym are in place. There is no current projection on when this will be the case.

In summary, the project is moving in such fashion that there is a possibility of meeting our present main building target close in date of April 1, 1980 (working day 574). To do this will require careful and continuous good field management but is feasible. However, by close in interior rough work must be to a point where finish trades can start.

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CONSULTING ENGINEER

The auditorium and gym areas will not be able to have finish work started there until probably May or more probably June, 1980. We should update the network model, Issue #4 and #5, at a session soon once better information is obtained on the close in progress. I shall be in touch with Mr. McQuade soon about this updating session.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Bruce McQuade

cc: Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

April 29, 1980

Subject: Monitoring Report #7 (for construction)
Eden Prairie School Expansion
Eden Prairie, Minnesota
Kraus-Anderson of Minneapolis - construction managers

Project: 79:41

Monitored from Issue #6, dated February 18, 1980 (working day 535)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: February, 1981

Actions taken:

- Inspected project
- Reviewed project progress with Mr. Roger Johnson, Mr. Bruce McQuade and Mr. John Williams
- Evaluated current project status
- Prepared tabulation of immediate actions required to maintain job momentum
- Prepared decision tree re course of action to be taken to minimize future job problems
- Discussed potential work stoppages due to trade contract expirations

General Summary

As of April 23, 1980 (working day 590) all supported floor pours have been made except at the auditorium side of the auditorium balcony. The main classroom portion of the building is substantially closed in, and it is possible to maintain this area in the dry except at the construction access points and the skylights. Temporary protection could be provided at these areas if required. Glass is being installed in the classroom area.

4/23/80 (632) not done

sky lites arrived & hung (small + long

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CONSULTING ENGINEER

The southeast classroom area is ready to start interior drywall framing and board work. This work is expected to begin at the southeast second floor within the next few working days. Overall, difficulties are still being experienced in closing in the northern areas including the gym, auditorium, auditorium support area, and shop areas. Presently masonry is being completed at the auditorium. No work has yet been done at the north wall completion at the gym. Joists have been partially installed over the shop area, and some steel columns have been set at the auditorium support section. The lags on the project due to slow close in of these northern spaces is becoming of concern and will increase unless the work pace can be picked up particularly in masonry work.

Electricians went out on strike April 11, 1980 (working day 582), and other trades are expected to consider work stoppages as their contracts expire. Key contract expiration dates are as follows:

Electricians back since ? to (622) 572 (40)

Pipefitters - April 30, 1980 (working day 595) settled

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

Plumbers - May 31, 1980 (working day 617) settled

Sprinkler fitters - June 30, 1980 (working day 637) no word

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

It has been observed that the pace of work has slowed considerably as contracts come up for reconsideration. It was noted, however, by Mr. Johnson that the electrical contractor and his tradesmen did maintain high production up to the start of the electrical workers strike.

It should be cautioned that traditionally, starting up of work after a strike period is difficult and it sometimes requires as much as 10 to 15 working days to resume full production. There is no current word on whether the other trades will go on strike, and there is little word on progress of the electrical negotiations. Therefore, an accurate evaluation of the impact of this strike is presently not possible.

There are some strike related matters that should be considered now. We will undoubtedly need temporary heat in the building by about early November, 1980 -- say November 10, 1980 (working day 730). This is 140 working days from today. At the equipment room, some mechanical equipment is set. However,

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C/E 3/20

SOG done

the floor slab on grade is not constructed and cannot now be completed due to the electrical strike. This has the impact of leaving much of the work at the boiler room to be done once trade negotiations are completed and contracts renegotiated.

This problem also is a consideration in evaluating current slab on grade progress, although underground utility work can proceed in most areas since these trades are still working. However, the actual construction of the slab on grade is restrained by installation of electrical conduit in many cases. I suggest we bring every component of the job -- masonry walls, slabs on grade, roof decks, and every other major component -- as far along as we can, up to a point where lack of electricians stop the work, just as quickly as possible. The reason for this is that any work to be done following contract settlements will undoubtedly cost more than work done prior to contract settlements. In addition, it is desirable to insure that the job if left in pre-strike clean condition ready for a good startup once the work stoppages, if any, have been settled. This helps speed the start up process.

An item of concern in the entire facility is the fact that many of the areas are being brought to a point of completion similar to that at other areas. This means that the work progression throughout the building is getting out of phase with our anticipated finish sequence decided upon at our previous meeting, February 18, 1980 (working day 543). This sequence agreed upon was to move finish trades starting with drywall from CE2 to CE3 to CE1 to CW1 to CW2 to CW3.

still good

A sequence has not yet been set for movement of finish trades at the gym, auditorium, auditorium support area, food service, and the shop area. However, the roofing sequence for these special areas goes from the auditorium to the gym, while concurrently being installed at the boiler room kitchen areas. These sequences are important to maintain.

not set

BR done

It will be necessary to complete above ceiling rough work in order to begin interior finish trades and move ultimately to installation of ceilings. At areas CE2 and CE3 above ceiling rough work is in fair to good shape and board work, followed closely by painting and ceilings, could start there almost any time. The intent is for the drywall contractor to move on the job April 24, 1980 (working day 591). However, the third area in sequence, CE1, the first floor of the east classroom unit, still does not have all of the rough work completed so finish work could proceed on through without

moved in

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6/23/80

delay. Also, there is a portion of the east classroom area that does not have the slab on grade completed. In the western quadrant first floor sheet metal work has not yet begun. However, rough piping and electrical work is partially installed. The major hold up at the first floor is underground plumbing work and the interior slab on grade. This, in turn, is restrained by a need to clean the first floor area thoroughly. There is still much contractor equipment, debris, and material that make it difficult, if not impossible, to install underground utility work at this area.

SE pond
SW SAC
sta-hol
(±20%)

At the second floor of the western area, which follows CW1 in the finish sequence, sheet metal duct work is about half complete, mechanical piping is in work, and rough electrical work is also well along. However, there still remains considerable interior rough work to install before finish trades can start.

The third floor of the western classroom unit still has sizable amounts of above ceiling rough work to be installed.

Therefore, it appears that with the present position of the job that interior finish work in the classroom areas is going to be severely restricted relative to continuous work action unless rough trades can be brought to a higher completion point within the next two to four weeks. Mr. Johnson points out that the piping at the ceiling of the second floor of the west unit is, to a large extent, glass piping from the laboratories above. Therefore, installation is being delayed as long as possible to minimize vandalism and breakage. However, all this piping will have to be installed sometime, and I suggest its installation be related to provision of security for the building prior to total close in.

Of prime importance on the project over the next few weeks is to:

A. complete as much as possible, preferably all, of the sheet metal and mechanical piping above ceiling.

B. give the job a thorough cleaning. Presently the debris inside and outside of the building hinders work installation. This matter is to be investigated by Mr. Johnson and Mr. Williams.

Letter

C. close in each of the classroom floors and most especially the northern special units. This requires intensive attention to installation of masonry, roof framing, insulation and roofing, and remaining glass and entrances at the classroom area.

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D. complete all underground plumbing and bring interior slab on grade areas up to the point where in floor work and electrical conduit particularly can be placed. During the electrical strike, conduit cannot be installed but once the strike is over it should be possible for the electricians to move in immediately and then pour out the remaining slab on grade in short time.

E. complete stairs and fill treads to maintain effective vertical access to all floors by tradesmen

F. initiate elevator work just as soon as possible. This, although being somewhat symbolic, does signal the intent to pursue finish trades work in the building in an aggressive manner.

G. once the trade stoppages have been resolved, get the slabs on grade poured out immediately. These are extremely critical to job progress and continue to be a major bottleneck to effective work on the lower floors.

H. initiate site work in the very near future. Site work is extremely important since if any trade stoppages delay work beyond mid-summer it will be very difficult to complete installation of weather-sensitive work prior to the onset of cold weather.

Measuring the job progress against the current Issue #6 network model, dated February 18, 1980 (working day 543) the current lag appears to be 10-20 working days primarily in interior finish work, basically the start of painting and board, as well as in the installation of above ceiling and slab on grade work.

At our session we had a major discussion about the course of action that could be taken to improve field performance. We identified about 23 techniques and activities that might be carried out to encourage better field performance in selected areas over the next few weeks. These were assigned desirability ratings and possibility ratings. Some were selected as courses of action to be followed in the immediate future, and Mr. Johnson and Mr. Williams will take steps within the next week to bring these actions to bear on the job.

It is most important that all parties to the project realize that improving field performance over the next few weeks will be beneficial to themselves as well as to others. The critical matter is to maintain the target date for

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

6/23/80

Letter coming

completion since it would be undesirable to extend the job to a point where it would not be possible to take over and occupy the facility until a late date when students could actually be moved into the building. This increases the possibility of a building sitting unused for too long a period of time and is historically proven to be an undesirable situation.

All E. Ed. 50 in.

At our next session, I suggest we diagram remaining work on the project including site work, kitchen area installation, interior finish work at the auditorium support area and the auditorium and, if considered desirable, completion of work at the boiler room. I shall discuss with Mr. McQuade, Mr. Johnson, and Mr. Williams as to the advisability of doing this prior to our next monitoring session.

It might also be wise to consider that the major contractors involved in the remaining work be requested to participate in the planning sessions for these special areas. Usually this produces benefits in that it gives all a voice in the planning of the project and also tends to bring out problems that can be mutually discussed and resolved.

It is important to insure that we get a good handle on procurement of the remaining materials and equipment to be brought to the job site. This could best be done if the contractors involved are made part of our planning session. As a note on the procurement process an immediate check should be made on the availability of food service equipment since it will be necessary to bring this equipment to the job site sometime prior to completion of the food service area. We discussed this briefly at our planning session. Mr. Williams will check the current status.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Bruce McQuade

cc: Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

July 9, 1980

Subject: Monitoring Report #8 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - construction managers

Project: 79:41
Date of Monitoring Jun. 23, 1980 (wd 632)
Monitored from Issue #6, dated February 18, 1980 (working day 535)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: February, 1981

Actions taken:

- Inspected project
- Reviewed project progress with Mr. Roger Johnson, Mr. Bruce McQuade, and Mr. John Williams
- Evaluated current project status

General Summary

The electricians' strike which lasted from April 11, 1980 (working day 582) through June 9, 1980 (working day 622), a period of 40 working days, has slowed the job considerably and prevented much of the masonry and the floor slab on grade work from being completed in April and May, 1980. Thus, work has moved very slowly on the job with the major difficulty now being the start up process trying to acquire adequate electricians to stay ahead of masons. Major efforts are being made to get electrical work installed with exterior masonry particularly at the gymnasium, auditorium, auditorium support area, and shop so the buildings can be closed in as quickly as possible.

Major roofing at the classroom building is complete although there still remain roofing trim items to be installed. Structural steel and metal deck is being erected at the auditorium support area. It is important to get the roofer back on the job to close in available work areas now so interior finish work can begin as soon as possible. I suggest an intensive effort be made concurrently to close in all

RALPH J. STEPHENSON, P.E.
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miscellaneous openings in the skin of the building. Skylights for some roof areas arrived on the job today, June 23, 1980 (working day 632) and are to be installed immediately. It is urgent that the classroom building be tightly closed to weather, and for security just as quickly as possible.

We had a major discussion at our session about how best to approach getting the remaining work sequences initiated in an orderly and aggressive manner following the strike. The problem now is that many of the building areas are at about the same stage of completion, and thus we are in the position of restarting several areas at the same time while generating completion dates based upon needed turnover cycles. I recommended to Mr. Johnson and to Mr. Williams that a detailed inventory of the status of each major area be made identifying in detail all work that could be done now and all work that is restrained by pending activities. Next, heavy efforts should be concentrated upon getting those key contractors to the job to complete the operations possible to be done now that restrain future activities. *

This analysis can be made from the current network model used along with the knowledge and ability of the field and office project staff for Kraus-Anderson. This needed set of activities then can be referred to in bringing meaningful pressures to bear on areas that need the most attention. It is essentially a method of managing by exception so as to achieve the best results in a directed manner.

Evaluating further some of the more critical areas we reviewed the current status of each of the classroom interior sections. It is still planned to move from the second floor of the east wing to the third floor east and then down to the first floor east. From the first floor east the intent is to move to the first floor of the west classroom area and then to the second west finishing out at the third west. This is the sequence for interior finish work to be installed over the next few months.

Thus, the classroom area CE-2 (second floor in the eastern section) is a key area that must be focused on at present to insure work will proceed as planned.

The projected lag at second floor east is basically in installation of acoustic grid and conduit. Work is about 39 working days behind desired targets. It was intended that a portion of the grid would be installed sufficient to release installation of light fixtures and other following work by April 28, 1980 (working day 592). Overall, it can be expected that the lag will carry on through to other areas unless some method is found to compress work durations and recapture the delays.

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We spent considerable time talking about how this might be possible, and efforts will be made in the very near future to translate this discussion into concerted activity in the field. Of importance will be to complete pouring out the first floor slab on grade at the west area, and this work is in progress with the special slabs at the food service area being installed. It will be important to also pour out the conventional slabs on grade at the west first floor just as quickly as possible.

Items to be checked on the job that should be followed carefully include procurement of remaining equipment and materials. I further suggest that kitchen equipment, hoods, color schedules, and other such elements be reviewed in detail to insure that we have all information necessary to maintain work continuity. Apparently all color schedules are not yet issued, and this will soon become a very important document. Painting has already begun in the east classroom area.

We also spoke at some length about site work. Site work construction will be very important since the time between now and early November, when asphalt paving deliveries can be expected to be suspended is only 90 to 100 working days. There is a sizable amount of outside work to do, and we prepared a laundry list of items that needed to be accomplished. Of prime importance is to clear the north area where paving is to start and to insure that site work can proceed without interference around the perimeter of the building on grading and installation of paving, walks, and utilities as required. I suggest this be started immediately.

Overall, the project lag may push the job past a desirable end date where the school could be used in early 1981. Therefore, I suggest every effort be made to recapture lost time so as to re-establish a realistic chance to meet target completion of February, 1981. I believe with some heavy emphasis upon critical work areas over the next few weeks that headway can be made at accomplishing this.

Also of importance is the need to concentrate on special areas to the north including the gym, the auditorium, auditorium support area, and the shop. The boiler room slab on grade has now been poured out and installation of equipment there is in reasonably good condition. Again, we must make certain that the plant will be able to provide heat for the coming winter season. This should be established early so as to insure that the environment within the building can be controlled. Supplementary mechanical equipment rooms at areas of the building should also be expedited to insure that these also are available for heating as required.

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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. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

August 5, 1980

Subject: Monitoring Report #9 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - construction managers

Project: 79:41

Date of Monitoring: July 28, 1980 (working day 656)

Monitored from Issue #6, dated February 18, 1980 (working day 535)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: January 5, 1981 (working day 767)
(This is the actual student walk-in date presently desired.)

Working days remaining to occupancy: 111

Actions taken:

- Inspected project
- Reviewed project progress with Mr. Roger Johnson, Mr. Bruce McQuade, and Mr. John Williams
- Analyzed progress over the past 24 working days since previous monitoring
- Evaluated current project status

General Summary

The project has made good progress in some areas over the past month including clean up, installation of exterior sidewalks, work at the auditorium and completion of floor slabs on grade at the west classroom wing. However, in the process of bringing these areas closer in alignment with desired dates, work at critical repetitive areas in the classroom east and west has slowed. For instance, in the east wing, each floor, 1, 2, and 3, is practically at identical finishing points. Walls have been partially painted, ceiling grid installed, and the ceilings are ready for in-filling.

At the west wing the second floor is the furthest along with ceiling grid have started. There still remains some overhead

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work and masonry to be completed at two west before grid installation can be finished. The third floor of the west wing is the next most complete and is ready for masonry to be followed by grid. First floor west work had been deferred until all slabs on grade both special textured and conventional were completed. These slabs are substantially complete now and the areas can be cleaned, rough overhead work completed, and finish work started.

Because of the current position of interior work, the sequence at the west wing will now be to finish from 2 to 3 to 1. The sequence at the east wing remains 2 to 3 to 1.

At special areas, the gym, auditorium, auditorium support area, shop, and food preparation, work has moved fairly well since the electricians have come back and exterior masonry is substantially complete at these special areas. Gym roof joists are erected and metal deck is being placed. Scaffold for the north masonry wall is now being dismantled, and this should free up the northern part of the site for heavy concentration on site work. The auditorium has been roofed, and interior redwood clouds are being fabricated and hoisted into position. The auditorium support area is not yet roofed but the room is being made ready for slab on grade work. The slab probably will be poured out within the next week.

At the food preparation area, slab on grade work is complete and overhead piping and other rough trades are being completed. Still of prime importance is prompt delivery of food service equipment, with special attention to those items that restrain ceiling work. Apparently most equipment is available at food service.

A potential problem is appearing in delivery of lab equipment to be installed in the west classroom wing. The furnishings, fixtures, and equipment (FFE) package has been broken into units to allow early submission, evaluation, and award of contracts for lab equipment. These proposals are due tomorrow July 29, 1980 (working day 657). Contracts will be awarded immediately and, of course, the usual procurement sequence of shop drawing submissions, reviews and approvals, and fab and deliver will then begin. If we assume that the contract can be awarded within 10 working days, followed by shop drawings submitted within 30 working days, and approvals taking 10 working days, approved shop drawings will be in hand by October 8, 1980 (working day 707). Installation will require at least 20 working days. Thus, it can be seen that this item is now highly critical and must be given daily attention.

As part of our evaluation we went over the suggestion evolving from our previous monitoring of the need for a comprehensive, detailed list of items that could be worked upon and a tabulation

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of the restraints upon them at each of the floors. Mr. Johnson has prepared this list and a brief review shows it to be quite complete. I suggest the list be used as the basis of discussions at each regular meeting as well as at interim informal meetings and that it be used to pinpoint what trades and which activities should be going on currently. For instance, job status and the list shows in the east classroom wing the interior of floors are all at relatively the same position, which is one almost certain sign that successive sequencing will be difficult to establish. So, it becomes imperative that we immediately start finish work at the second floor of the east wing if we are to still follow the sequence originally planned.

Site work list items are getting under way and it should be remembered that asphalt plants usually shut down early in November which gives us only a brief time in which to get ready for paving and trades that follow such as landscaping, and finish grading. Presently plans are to begin paving within the next 15 working days.

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

Classroom east second floor

9/24/80 (657)

The current lag at the area is approximately 63 working days over the floor completion target of August 15, 1980 (working day 670) for this particular area. The completion target for each of these areas was originally set by using a turnover cycle of 15 working days. If we analyze the six major classroom areas we find we still have approximately 67 working days to completion of the first floor to be completed, the classroom area east second floor. Using a 15-working days turnover cycle projects completion in mid-February, 1981, unless we can reduce the duration required to finish one area, reduce the total number of areas (which means assigning multiple crews) or cut down on the turnover cycle of 15 working days.

Lag 10x w1

Classroom east third floor

The lag here is also in in-filling of the ceiling system and is presently about 48 working days. This, of course, is a current lag and is somewhat less than the projected lag caused by taking into account the turnover cycle from the second floor on.

Lag: 41 w1

Classroom east first floor

Lag 53 w1

The current lag is 33 working days again in ceiling work. An analysis of the three floor status points up the need to work in more than one area at a time with multiple crews.

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9/24/80

This is one of the quickest ways to recapture some of the lost time, but the activity must be initiated immediately if it is to be effective.

Classroom west second floor

The current lag is approximately three working days in installation of ceiling work. However, it should be noted that rough work above the ceiling is not totally complete at the second floor, and must be given immediate attention so as not to stop installation of the grid. It is critical in the west wing that the accustic ceiling installer be allowed to maintain continuity of work or else he will have to pull off the job. It is essential that ceiling installation move to the next area in the west wing presumably the third floor just as soon as it is complete at the second floor.

Lag: 4?

If we consider that the east and west wings are to be worked concurrently on in-filling trades at the ceiling it is entirely possible we can complete the project earlier than the too-late mid-February date indicated by the turnover cycle analysis. However, it will require immediate increased crewing on the job so as to work on the two classroom areas concurrently.

Classroom west third floor

The ceiling grid was due to begin at the third floor by July 31, 1980 (working day 659). It will probably not hit that target but if we can maintain a start there within ten working days of the target if will be a great help in readying the west wing for in-filling work at ceilings.

Lag: 30+/

Presently the restriction on the start of ceiling grid at the third floor is some miscellaneous sheet metal remaining to be completed above the ceiling and installation of interior masonry walls. There is considerable masonry still to be built, and this work should be started as soon as possible. Masonry is presently restrained by completion of plumbing stubs for lab equipment up from the second floor ceiling. This work is being installed now.

Classroom west first floor

The current lag at the first floor is 27 working days. However, if we change the sequence of work at the west wing from 1 to 2 to 3 to 2 to 3 to 1, it may be that the lag is not as serious as it presently appears. From our discussion today, it is almost certain that the sequencing target will change, and I suggest we obtain sepias of each floor and recalculate work yet to be done based upon the revised sequence. I shall discuss this with Mr. McQuade and Mr. Williams.

Lag: 70.

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Lower gym area (LG)

No major work has been done here over the past five weeks. Finishes at the area are still restrained by installation of the gym roof. There remain approximately 8 to 10 weeks of work to finish off the area. It should pose no completion problems.

Gym area (G)

The roof metal deck is now being installed at the gym, and roofing should begin within the next five working days. Completion of roofing will allow rough ceiling work to begin, followed by gyp enclosures, painting, light fixtures, wood flooring, and folding door work. There is still about 135 working days or six months of work remaining in the gym from completion of erection of gym structural steel and deck. Therefore, it will be important to follow through with work there independent of other areas of the facility.

Auditorium (A)

The sound baffles are presently being fabricated and hoisted, and overall work at the auditorium is proceeding fairly well. However, there is a considerable time required for installation of auditorium finishes and we may want to plan this activity in more detail at a subsequent monitering session. The auditorium will be a difficult area to complete particularly since there is so much concourrent work being carried in other portions of the facility.

General

Overall, although progress has picked up in close in of special areas and clean up of the site there still remains a sizable amount of work to be done over the next 111 working days. Of critical importance is that we no longer can afford to consider crews moving in a sequential pattern from area to area. We must now plan to carry out work concurrently in the east wing with that at every other area of the building most particularly with that at the west wing. Interior finishes at the gym, auditorium, auditorium support area, and shop must also be moved concurrently. Without concurrent activity on the part of all trades involved in finish work we will not be able to complete the project on our present occupancy target. Heavy efforts will be directed toward multiple crewing on the job.

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

Ralph J. Stephenson, P.E.

RJS:sps
To: Mr. Bruce McQuade
cc: Mr. Robert Copeland
Mr. John Williams Mr. Jerry Svee

Jerry McCoy - supt of school bds
Ann Johnson - principal

Mike Anderson

10/28/80 (721)
767
(4 wks)

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

September 29, 1980

Subject: Monitoring Report #10 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - construction managers

Project: 79:41

Date of Monitering: September 24, 1980 (working day 697)

Monitered from Issue #6, dated February 18, 1980 (working day 535)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: January 5, 1981 (working day 767)
(This is the student walk-in date presently desired.)

Working days remaining to occupancy: 70

Actions taken:

- Inspected project
- Reviewed project progress with Mr. Ron Waite, Mr. Bruce McQuade and Mr. John Williams
- Evaluated current project status
- Discussed methods by which concurrent work activities on major classroom elements could be initiated.

General Summary

The major effort at this monitering session was to establish probabilities of completing various major elements of the project by three different evaluation dates - January 5, 1981 (working day 767), January 16, 1981 (working day 776), and March 30, 1981 (working day 827). This evaluation is to help the school board judge what areas of the facility could be occupied by these dates and make plans for moving into areas that could be used as early as possible.

Overall, work on the project has moved rather slowly over the past 41 working days (since the previous monitoring). Of particular concern is interior work at the classroom

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west and classroom west and construction of special areas, particularly the auditorium support area. In addition, a heavy concentration of effort is needed at the various equipment and fan rooms so heat will be available for the entire facility this winter.

At the east classroom wing carpet and movable partitions are in work, and interior finishing shows a relatively high probability of making an early January, 1981 completion date. At the west classroom wing, there still are sizable amounts of work to be done, but of even more importance is the need to expedite deliveries of lab equipment for the 3rd floor to constantly check availability of food service equipment for the 1st floor, and of course as at all special areas, to closely monitor status of the furniture and furnishings needed to make the school operative.

Exterior work has moved well over the past month and a half with paving, curbs and sidewalks nearly all installed. Landscaping is just beginning and will have to be moved rapidly since we are nearing the end of some of the restrictive season for installing landscaping items. The new road being built by the city to the south of the site is being graded and curbs will be put into work soon. It is important to get this curb in so the gas line serving as the second source of fuel to the building can also be installed. It apparently follows the contour of the inside curb line.

At the special building areas there is still difficulty in bringing construction to the point where completion dates can be predicted with accuracy. In some cases rough work is still under way and, of course, this restrains initiating finish work in some of these areas.

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

Classroom west first floor

From the network model it appears there are remaining about 89 days to complete which, if actually required, and based upon immediately starting on work to be done, would bring completion to January 30, 1981 (working day 786). It is essential that masonry there be completed as quickly as possible so ceiling grid and conduit can be initiated. Some estimates place the beginning of grid at as much as 20 working days from September 24, 1980 (working day 697). This amount of time to starting ceiling must be reduced if at all possible.

A difficulty which the project is encountering again is that many of the classroom areas are nearly at the same stage of completion. This means that the floors have to be worked on concurrently or else they will be spaced out and develop turnover cycles of their own. Present target completions indicate there are far too many of the areas that the projected as finishing almost at the same time. This actually seldom happens and therefore it is essential now that we maintain high productivity of work in all areas possible.

At the 1st, 2nd, and 3rd floors of the west classroom area closing in of the construction access portion of the wall to the south is under way. However, this close in is a metal and glass store front enclosure and will take considerable time to install. Therefore, it might be necessary, on a temporary basis, to provide protection from driving weather.

Classroom West 2nd floor

At the second floor there still appears to remain about 77 working days bringing projected completion to January 14, 1981 (working day 774) if the work could proceed immediately. Here, however, as with other floors the work will tend to be sequenced and adjusted to the number of men available unless crewing is increased.

Classroom west 3rd floor

Projections to completion here show that the floor could be done by January 28, 1981 (working day 784). However, this floor houses lab equipment which is on order with delivery presently anticipated sometime late this year. Lab equipment traditionally is difficult to get and quite frequently fabrication difficulties slow installation of equipment and hookup. Therefore, we must try to get this equipment on the job as early as possible so it can be checked out early.

Classroom east 1st floor

Carpet is just starting at this portion of the building, and the expected amount of time to completion is about 57 working days bringing the projected end of work to January 15, 1980 (working day 754).

Classroom east 2nd floor

There still remains considerable work on the ceiling, primarily installation of light fixtures, speakers, grills, and diffusers. This work is expected to be done within the next five working

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days and will allow carpet to start by October 1, 1980 (working day 702). There probably remain about 77 more working days total work which would bring projected completion to January 14, 1981 (working day 774), if this work is carried out concurrently with all other operations in the building.

Classroom east 3rd floor

Carpet is substantially complete and multiple partitions are moving fairly well at this level. It is estimated there are about 29 working days to complete work, bringing projected completion of the 3rd classroom floor east to November 4, 1980 (working day 726).

Shop

Masonry is nearly complete at the shop with the exception of the west wall, and it appears that with a fairly heavy concentration of attention the shop area could be completed within the next 30 working days. This brings its projected completion to November 5, 1980 (working day 727).

Auditorium

Most ceiling work is complete at the auditorium and presently risers and supported decks at the rear of the auditorium are being completed. There probably are about 60 more working days of installation at the auditorium which would bring projected completion to December 18, 1980 (working day 757).

Auditorium support area

The biggest problem at this portion of the building will be completion of the sizable amount of masonry remaining. This is a trade that traditionally on this job has been difficult to expedite. In addition, there are considerable current demands for masons in other parts of the building.

The estimated amount of time to complete work at the support area is about 100 working days bringing projected completion to February 16, 1981 (working day 797). This is a slightly heavy estimated amount of time to complete, but taking into account the amount of other spaces that must have work done at the same time it was made conservative for purposes of this analysis.

Gym

The gym is closed in but no major overhead work has yet begun. Our network model indicates it will take about

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135 working days to complete the gym from the time that rough overhead work does begin. This time estimate may be a little heavy, and so reducing it to an estimated 105 working days brings projected completion of the job to February 23, 1981 (working day 802).

Food service area

Apparently most food service equipment is in town and stored at the food service contractor's plant. I suggest we check now to insure that all pieces supposed to be stored are actually in storage. This trade is traditionally one that must be watched carefully since there are many small items of equipment that sometimes come to the job on a staggered basis.

If hoods are available probably they will have to be installed before ceiling work starts in the kitchen area. Thus, the hoods especially should be located and a determination made as to exactly where they go and what fireproofing, if any, is needed on the duct work.

Another item to be checked at the food service area is whether all field measurements have been taken. Occasionally it is either required to take these field measurements from completed walls or to guarantee dimensions to avoid misfits. This matter is to be looked into by Mr. John Williams immediately.

Locker room at east classroom

Painting is just beginning, and it is assumed that finish work will require another 40 working days bringing projected completion to November 19, 1980 (working day 737). There is some corrective action to be taken on masonry work at some of the areas in the locker room. This work should be done now while it can still be done with ease.

Wrestling and weightlifting

There remains about 20 working days to complete work at the wrestling and weightlifting room from today. This brings completion of the area to October 24, 1980 (working day 719) as an early finish.

Library

Much of the finish work at the library has already been installed. So from now on it will be necessary to make the building completely weather tight, install miscellaneous finish items there, and install vinyl wall covering on the major exposed gyp board. There are probably as many as 40 working days remaining which brings projected completion to November 19, 1980 (working day 737).

* * * *

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The above information about the project was tabulated and an estimate made of the percent probability of completing the work at each area by given dates. The probability of completing this work was figured by analysing how many days it would take to finish each classroom area from start of carpet to completion and cleanup based upon different time assumptions. Under our present plan of work, it is estimated that at classrooms the normal time will be 57 working days. There is a possibility of compressing this since the original assigned durations were somewhat conservative. However, tempering this judgement with the compression of time considered possible must also be further influenced by how long before we can reach the point at which carpet can be installed in each of the areas. In addition, as probably can be seen from the above analysis, the number of spaces that could be finished at dates very close to each other are considerable. This work will have to be spaced out which indicates that the probabilities must be further tempered by ability of the contractors to maintain current work operations in the building. This intensive current crewing has not been done in the past and therefore a low probability has to be assigned the possibility of it happening in the future.

The table below documents present information we have about the various areas as well as in the last three columns giving, in my opinion, the percentage probability of hitting the completion date at the head of the column.

As of 10/21/80 (721)

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As of September 28, 1980 (working day 697)

Area	Working Days to complete (Estimated why Long, Required to Complete from Previous)	Anticipated early completion date if concurrent work is carried out	Percent Probability of Completing the area by this date: Jan. 5, 1981 (767)	Jan. 16, 1981 (776)	March 30, 1981 (827)
C#-1	89 89	Jan. 30, 1981 (working day 786) 3/5/81 (810)	50 20	60 40	99 75
C#-2	77 75	Jan. 14, 1981 (working day 774) 2/13/81 (794)	60 25	70 50	99 85
C#-3	87 87	Jan. 28, 1981 (working day 784) 3/3/81 (808)	40 20	50 40 (Because of lab equipment)	90 75
CE-1	57 20	Jan. 15, 1981 (working day 754) 11/25/80 (771)	99 100	100 100	100 100
CE-2	77 15	Jan. 14, 1981 (working day 774) 11/17/80 (737)	90 100	99 100	100 100
CE-3	29 15	Nov. 4, 1980 (working day 726) 11/19/80 (734)	100 100	100 100	100 100
Shop	estimated at 30 working days 20	Nov. 5, 1980 (working day 727) 11/25/80 (771)	95 90	98 95	100 100
Auditorium	about 60 working days 40	Dec. 18, 1980 (working day 757) 12/24/80 (790)	90 70	92 90	100 100
Auditorium support area	estimated at 100 working days 70	Feb. 16, 1981 (working day 797) 2/6/81 (791)	10 25	15 40	90 95
Gym	estimated at 105 working days 90	Feb. 23, 1981 (working day 802) 3/4/81 (811)	10 10	20 20	100 100
Food Service	estimated at 80 working days	Jan. 19, 1981 (working day 777)	20	25	95

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As of September 28, 1980 (working day 697)

Area	Working Days to complete	Anticipated early completion date if concurrent work is carried out	Percent probability of Completing the area by this date: Jan. 5, 1981 (767)	Jan. 16, 1981 (776)	March 30, 1981 (827)
Locker room	approximately 40 working days	Nov. 19, 1980 (working day 737)	95 95	99 99	100 100
Wrestling and weightlifting	approximately 20 working days	October 24, 1980 (working day 719)	99 95	99 99	100 100
Library	approximately 40 working days	November 19, 1980 (working day 737)	100 90	100 100	100 100
Food service	estimate 80 working days	Jan 19, 1981 (WD 777)	20 15	25 25	95 90

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It is emphasized that the above percentages are estimates of the chance of finishing by the dates at the heads of the columns. Right now the major deterrent to finishing these areas in the manner that would be best for all concerned is that a great amount of similar trade work must be done at about the same time in all areas. Since on this job there is a shortage of some tradesmen concurrent action becomes very difficult to bring about and thus accounts for the adjustment of the chances of achieving target dates to lower percentages than might normally be the case if a reasonable turnover cycle sequence was being maintained.

I suggest at our next monitoring session we prepare a network model for each of the unfinished areas based upon the logic that we have prepared and laid down in previous networks. This should allow us to predict with more accuracy the actual end dates possible to achieve.

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

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Bruce McQuade

cc: Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

November 8, 1980

Subject: Monitoring Report #11 (for construction)

Eden Prairie School Expansion

Eden Prairie, Minnesota

Kraus-Anderson of Minneapolis - construction managers

Project: 79:41

Date of Monitoring: October 28, 1980 (working day 721)

Monitored from Issue #6, dated February 18, 1980 (working day 535)

Approximate start of field activity: May 1, 1979 (working day 340)

Target completion date: January 5, 1981 (working day 767)
(This is the student walk in date presently set as a firm target).

Working days remaining to occupancy: 46

Actions taken:

- Inspected project
- Reviewed project progress with Mr. John Williams, Mr. Roger Johnson, Mr. Bruce McQuade and Mr. Ron Waite
- Evaluated current project status
- Conferred briefly with Dr. McCoy, superintendent of schools and Mr. Johnson, principal of the new school
- Discussed project with Mr. Mikio Kirihara from the architect's office
- Participated in job meeting
- Evaluated current critical elements of the project

General Summary

Work progress has been good in the east wing, and it now appears that within the next 15 to 25 working days, the classroom areas at the 1st, 2nd, and 3rd floors in the east wing could be substantially complete. It was urged at the construction meeting that strong efforts be made

within the next 10 working days to complete all work possible at the 3rd floor so the architect/engineer could begin punching out the project. I recommend that the 3rd floor be punched out, corrected, repunched and final corrected so it can be used as a yardstick by which to measure the acceptability of other areas.

When the final punch out has been completed at the 3rd floor, I suggest the floor be locked to all tradesmen, and traffic reduced to only essential activities. The same should be done at the 2nd and the 1st floors as well as the library. This, of course, means that a new space will have to be found for the present construction office and conference room. However, it is vital that work be completed in major blocks in both wings as rapidly as possible.

At the 1st floor, the locker room and wrestling room are also at a point where within a very few days they could be completed, punched out, and locked. The main thrust is to progressively narrow down the space in which tradesmen are working so that a heavy focus of attention is given to critical areas. These critical areas are presently concentrated in the west classroom wing. Here major activities over the past month have been to pick up work that had been earlier bypassed for various reasons. Thus, actual progress on west wing finish work installation such as at ceilings, in painting and on other such trades has been negligible over the past month. Progress toward an actual completion point in critical trades has been limited to only three to five working days. This, of course, has pushed back projected completion dates obtained from an analysis of the work sequence shown on network model Issue #6, dated February 18, 1980 (working day 543).

It is possible that if increased manpower is put on the job by the key trades and that certain other activities are carried out, basically a heavy effort to clean the building, that the time to do remaining work in the west building can be compressed. However, right now it appears there is as much as 50 to 80 working days remaining to complete depending upon several influencing factors.

Discussed further in this report are some of the conditions that must be met if any compression of time is to take place. It should be remembered that adequate allowance must be made for hooking up the rather complex equipment

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that is going into the west wing. Most particularly this refers to 3rd floor lab equipment which should be arriving on the job sometime in the near future. Also, of importance is to clearly define what areas the owner wishes to move into on January 5, 1981 (working day 767). Probably soon after Thanksgiving the owner will begin moving his fixtures, furnishings and equipment into the building. In fact, furniture has already started to arrive at the site and once this is put inside the building it hampers full sequencing of trade operations at all areas. Nevertheless, it is clearly understood that such early delivery and setting of such fixtures, furnishings, and equipment is a normal and essential part of the owner move in. Thus, any early finishing of building work will be to the benefit of everyone concerned.

At the west wing there are several specialty areas that also must be carefully watched. Important among these is the shop area which is expected to be turned over as a part of the classroom facility. There is not a large amount of work remaining at the shop area but as with all other sectors of the building this work must be initiated before it can be completed.

The boiler room is ready to activate and although clean up there has not been completed, it is anticipated that tomorrow, October 29, 1980 (working day 722), heat can be turned on and hot water will be circulated so the interior of the building is under temperature control.

At the west wing food service area, preparations are being made to receive kitchen equipment now. However, there is only moderately firm word on its completeness and current location. I urge that an actual visual inventory be made of the equipment to insure it is all available. Of particular importance are the hoods since these restrain ceiling work. There is no clear answer as to whether hoods are presently on the job site or not. We had some discussion today about the need to fireproof duct work coming off the hood, and apparently fireproofing is not required. I suggest that approval of the non-fireproofed duct system be obtained in writing from the appropriate regulatory agencies.

Special areas at the 2nd floor include the auditorium support section which consists primarily of music and stage functional space. This area is now being concentrated on heavily and although it probably will not be available for the January 5, 1981 (working day 767) occupancy date it should be moved ahead as rapidly as possible since undoubtedly pressure will be brought to bear to occupy it soon after initial move in.

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The auditorium area is presently being completed with the floor pours at the top supported seating deck ready to be poured out. Once this pour is complete, work at the interior on seating and other finishes can proceed. The auditorium is somewhat critical in that the main entrance of the building to students is at the rear of the auditorium and work to be done there should be completed prior to occupancy on January 5, 1981 (working day 767).

In the east wing work at the gym is now beginning to gain momentum with installation of overhead mechanical and electrical work in progress. However, there still remains a large amount of work to be done at the gym, and present expectations are that gym construction will probably extend into February or March, 1981.

As part of the monitoring I attended the construction meeting and was asked by Mr. Williams to emphasize those points that could be considered critical to occupying the building by January 5, 1981 (working day 767). Listed below at random are these points and a brief discussion of each:

- Clean up. Clean up is a serious problem at practically every sector of the building, but most especially in the west wing. Here masonry was recently completed and the dust and debris that has accumulated has made it almost impossible to proceed with any continuity in trades such as ceiling work, painting, installation of light fixtures and other such finish operations. The amount of dust that remains in the air in the building is large enough to hamper seriously any efforts at progressive completion of finish trades. Therefore, if progress is expected to be made at the west wing in any measure consistent with what has to be done to complete by January 5, 1981 (working day 767) cleaning the building <u>immediately</u> as an absolute necessity.

  Also, it is important to clean up the other areas that are to be punched out since it is only by this progressive cleaning that the architect/engineer can be expected to proceed with a favorable approach to punching out.

- Locking up. When an area has been punched out and accepted as in substantial conformance to the standard of work it should be locked to all trades. This will insure that traffic will be kept to an absolute minimum and on an as needed basis only, thus maintaining the floors in as clean a condition as possible.

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- Certificate of occupancy. Undoubtedly a partial certificate of occupancy or its equivalent will be needed to move into the building. Early determinations should be made with the local regulatory agencies to insure that such a certificate can be obtained and to identify every condition that must be met to move into the space. Important to check will be the toilet facilities required, the exit requirements which must be met, the alarm and signal systems which must be operative and the traffic patterns which should be established to allow the students and faculty to enter and leave the school with minimal interference with tradesmen. All of these items are very important and early reviews of them with the agencies involved will save many headaches as the occupancy date nears.

- Areas to be occupied. I suggested to Mr. Williams that he prepare a set of reduced drawings identifying clearly the boundaries of all areas that are to be occupied on January 5, 1981 (working day 767). Once this is done, of course, provision must be made to provide temporary barricades so that student and construction traffic is not intermingled.

- Owner equipment. Fixtures, furnishings, and equipment (FFE) of the owner will be arriving on the job site shortly. This constitutes a considerable bulk of material to be put into place, stored and protected. Of particular importance is the equipment such as in the shop and at the lab which must be hooked up after setting. Care should be taken to bring lab equipment particularly to the job early enough so its hookup can be completed for the occupancy of the 3rd floor in the west wing.

- Signing. The signing drawings have not yet been issued, and this will be, of course, an important contract to let since clear directions and room identification must be set for proper early occupancy. It may be that temporary signing can be used and if this is the intent provision must be made to insure that the temporary signs are available.

* * * *

In my opinion, it is very important to obtain commitments from all contractors as to their ability to meet this proposed January 5, 1981 (working day 767) occupancy of classroom areas and the related facilities. Commitments

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to meet this date are important since the targets are possible to hit but will require a far greater effort measured against past performance to achieve. Without this effort probably the move will not be possible particularly at the west area. However, if this extra effort can be brought to bear by contractors, primarily the architectural trades contractors and those responsible for cleaning the building, then it is possible that we can meet the move in desired at the west and east wings.

Another element of the project that must be followed continuously from this point on is procurement of remaining items. Some of these have been discussed above. One other that shows a potential for a later than desired delivery is case work. Indications are that case work will be on the job in mid or late November, 1980. This allows only a brief amount of time in which to install the case work and to insure that it is properly in place. Perhaps it would be wise for the responsible managers on the job to prepare an exhaustive checklist of items remaining to be done and review these at each construction session.

In addition, at our next monitoring it might be wise to consider diagramming the remaining work to be done both to the January 5, 1981 (working day 767) early occupancy as well as the work that must continue on into the later months. I shall discuss this with Mr. Williams and Mr. McQuade at our next monitoring session.

Ralph J. Stephenson, P.E.

RJS:sps

To: Mr. Bruce McQuade

cc: Mr. Robert Copeland
Mr. John Williams
Mr. Jerry Svee