

THE ARCHITECTS COLLABORATIVE Inc.
HEALTH SCIENCES ARCHITECTS AND ENGINEERS

UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION

RECEIVED

FEB 10 1976

UNIV. OF MINN.
HEALTH SCIENCE
PLANNING OFFICE

MEETING NOTES

DATE: 20 January 1976

TAC JOB: 75046, Unit B/C Materials Transport System

SUBJECT: Reorganization of the Medical Records Department

PLACE: Room D120, Mayo Hospital

NOTES BY: Herman Zinter

PRESENT: Al Dees, Greg Kujawa, Bob Swanson (U/M)
John Scott, Herman Zinter (TAC/HSAE)

The purpose of the meeting was to review preliminary Scheme 3, dated 8 January 1976, for the Medical Records Department on Level 2 of Unit B/C. The following items were discussed:

ITEM

ACTION REQUIRED

1. The substitute steel framing for part of the Medical Records department has been purchased by the University and file storage can now be accommodated at Level 2.
2. With file storage and processing functions consolidated at Level 2, the secondary materials transport system of two stations, serving only the Medical Records department at Levels 1 and 2, can be deleted. The primary materials transport system includes stations at Medical Records on Level 2 and at the Word Processing Center on Level 1.
3. The following comments were made regarding the plan arrangement of Scheme 3:

ITEM

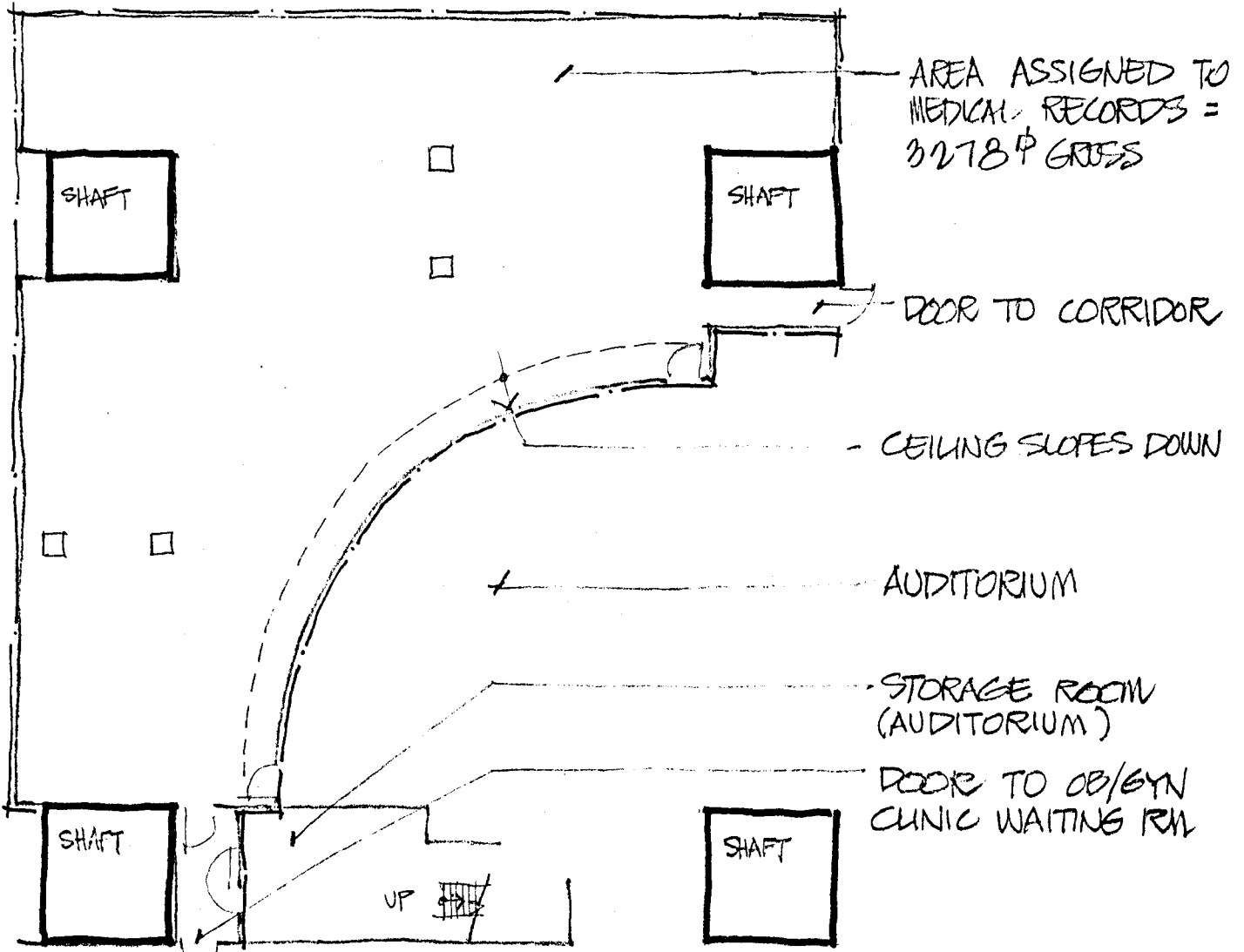
ACTION REQUIRED

- a. The records receiving and distribution functions should be located at the corridor entrance to improve aspects of supervision and contact with the waiting room.
 - b. The public and service entrances should be consolidated to improve control.
 - c. The office for the utilization review supervisor (Office 5) should be located with other office and conference functions near to the entrance and waiting room.
 - d. Space is required for cart storage. Presently, six carts are used to distribute records to other departments and five carts are used in record processing.
4. Further redesign of the Medical Records department, including detailed development of Level 2 and planning of the Word Processing Center on Level 1, is to be deferred until an overall program is defined for concurrent development of shell space in Unit B/C.
5. A sketch plan of the shell space assigned to Medical Records on Level 1, including a revised list of programmed spaces, is attached to the meeting notes. This was prepared on 20 January to summarize the current location and area of functions and was submitted to Al Dees the following day for reference.

cc: HSAE, P. Maupin, B. Swanson, B. Dickler, A. Dees, G. Kujawa, N. Omundson

MEDICAL RECORDS REORGANIZATION
 PLAN OF LEVEL 1 SHELL SPACE

1/20/76



1/16" = 1'-0"

PROGRAM (SUMMARY OF SPACES, BASED ON SCHEME 3, DATED 1/8/76)

TRANSCRIPTION ROOM (20 DESKS)	1300	1300	WORD PROCESSING CENTER
DICTATION RECORDING EQUIPMENT	40	40	
DUPLICATING & MAIL ROOM	225	225	
STORAGE & COATS	150	150	
OFFICE, SUPERVISORY	125	125	
OFFICE, CLERICAL (2 DESKS)	225	225	ADMINISTRATION
OFFICE, DIRECTOR	150	150	
OFFICE, ASSISTANT DIRECTOR	125	125	
RESEARCH STUDY (6 CARRELS)	300	300	RESEARCH
OFFICE, RESEARCH SUPPORT SUPRV.	125	125	
CONFERENCE	225	225	

2990 REF

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PLANNING OFFICE

MEETING NOTES

DATE: 21 January 1976
TAC JOB: 75046, Unit B/C Materials Transport System
SUBJECT: Business Office
PLACE: Room 4112, Powell Hall
NOTES BY: Herman Zinter
PRESENT: Dan Rode, Julia Aamodt, Bill Conner, Nels Larson, N. Omundson (U/M)
Herman Zinter (TAC/HSAE)

The purpose of the meeting was to review projected operations of the Business Office for distributing records, reports, stenciled forms or billing information in Health Sciences Unit B/C and to identify aspects which will depend upon the proposed non-scheduled materials transport system. The following items were discussed:

ITEM	ACTION REQUIRED
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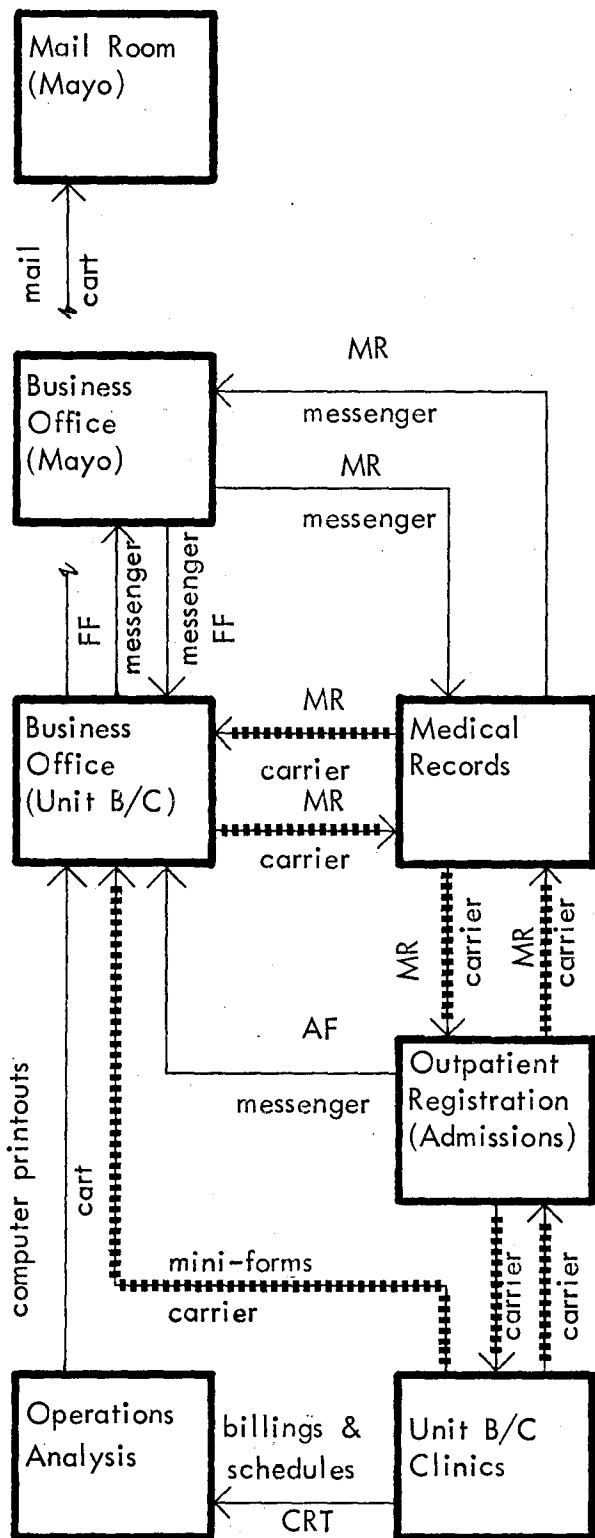
1. Reference is made to a memo from Nancy Omundson to John Scott, dated 6 November 1975, regarding the Admissions-Business Office in Unit B/C.
2. The following functions of the Business Office will be located in Unit B/C on Level 2:
 - . Outpatient Registration
 - . Outpatient Credit and Collections
 - . Cashiering
 - . Data Collection
 - . Billing
 - . Payment and Audit
 - . Filing

ITEM	ACTION REQUIRED
------	-----------------

3. The following functions will be located in the Business Office satellite, proposed for Level 3 in Mayo Hospital:
 - . Inpatient Registration
 - . Inpatient Credit and Collections
 - . Cashiering
 - . Bed Control
 4. The procedures for outpatient registration are described in meeting notes, dated 17 December 1975, regarding Admissions and Appointments.
 5. The operations of the Business Office which will use a non-scheduled materials transport system are diagrammed and annotated on the following page.
- cc: HSAE
P. Maupin
B. Dickler
D. Rode
J. Aamodt
B. Conner
N. Larson
N. Omundson

BUSINESS OFFICE

REMARKS



Most Business Office Functions will be located on Level 2 in Unit B/C. Inpatient admission, census and discharge functions will be located on Level 3 in Mayo Hospital.

Requests will be made from the Business Office satellite in Mayo Hospital for medical records and patient financial folders which will be filed in Unit B/C. Information will be transported by messenger unless computer terminals are operational for transmitting such data. Presently, approximately 20 non-scheduled charts per day are transported between Medical Records and Inpatient Admissions.

Approximately 60-80 charts per day (in batches of 4 or 5) will be transported from Medical Records to the Business Office. Trips occur mostly in the afternoon and later in the week.

Mini-forms to correct out-dated information will be completed in the clinics and transported to the Business Office by carrier (4-5 trips per day, total).

Computer printouts from Data Processing (approximately 141,000 - 160,000 sheets per month) will be delivered by cart to the Business Office. Most bulk shipments will occur in the morning.

Legend:

- MR = Medical Records
- FF = Financial Folder
- AF = Admissions Form

TAC

*Unit B/C - Materials
Transport*

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13 February 1976

Mr. Robert Dickler
Associate Director
University Hospitals
Minneapolis, Minnesota 55455

Regarding: Unit B/C - Non-Scheduled Materials Handling System

Dear Bob,

Summaries of assumptions regarding the non-scheduled materials transport system and related operations of the Linen Service and Business Office are enclosed for your information. These are based on meeting notes of 20 and 21 January and are in the format of the preliminary report on the transport system dated 19 January 1976.

I would appreciate your assistance in having the assumptions and traffic data reviewed and comments forwarded to me at your earliest convenience.

Very truly yours,

THE ARCHITECTS COLLABORATIVE, INC.

Herman B. Zinter

cc: P. Maupin
G. Kujawa
N. Omundson
HSAE

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FEB 12 1976

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PLANNING OFFICE

UNIT B/C NON-SCHEDULED MATERIALS TRANSPORT SYSTEM

BUSINESS OFFICE

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FEB 13 1978

UNIV. OF MINN. HEALTH SCIENCE CENTER BUSINESS OFFICE

Most Business Office Functions will be located on Level 2 in Unit B/C. Inpatient admission, census and discharge functions will be located on Level 3 in Mayo Hospital.

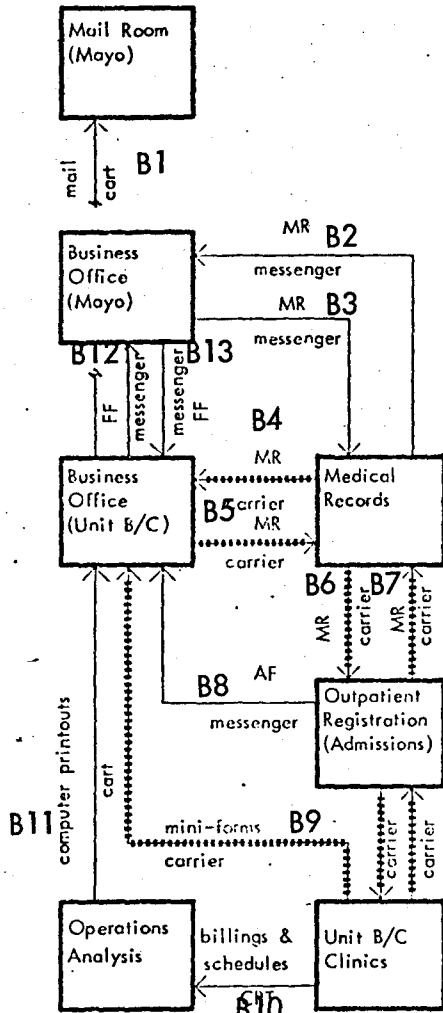
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Approximately 60-80 charts per day (in batches of 4 or 5) will be transported from Medical Records to the Business Office. Trips occur mostly in the afternoon and later in the week.

Mini-forms to correct out-dated information will be completed in the clinics and transported to the Business Office by carrier (4-5 trips per day, total).

Computer printouts from Data Processing (approximately 141,000 - 160,000 sheets per month) will be delivered by cart to the Business Office. Most bulk shipments will occur in the morning.

Assumptions

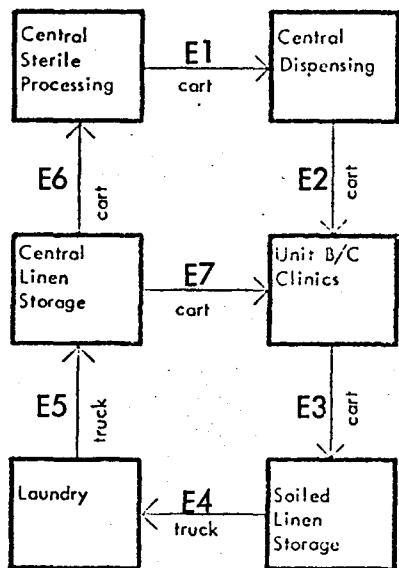


Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
B1	Mail			X
B2	Charts			
B3	Charts			
B4	Charts	60-80	12-16	4-5
B5	Charts	60-80	12-16	4-5
B6	Charts	20		
B7	Charts	20		
B8	Adm. Form			
B9	Mini-Form		4-5	X
B10	Billing			
B11	Printouts	8,000		X
B12	Folders			
B13	Folders			

FEB 10 1971

Assumptions



Linen will be distributed by environmental services personnel to approximately 90 user locations in the University Hospitals and Health Sciences Center. Schedules vary from 1 to more than 5 deliveries per week.

In Unit B/C the storage shelves for linen in clean utility rooms will be maintained on par stock rather than on exchange cart system. Satellite linen rooms will not be provided in Unit B/C.

Sterile linen will be issued to clinics from Central Dispensing (see description of supplies distribution).

Soiled linen will be bagged in the clinics and transported by cart to Soiled Linen Storage once a day.

Clean linen will be transported by truck from the laundry to Central Linen Storage seven times per day.

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
E1	Clean Linen			X
E2	Clean Linen			X
E3	Soiled Linen		1	X
E4	Soiled Linen			X
E5	Clean Linen		7	X
E6	Clean Linen			X
E7	Clean Linen			X



UNIVERSITY OF MINNESOTA
TWIN CITIES

Unit B/C - Materials Transit Systems
University Hospitals
Minneapolis, Minnesota 55455

RECEIVED

FEB 27 1976

February 26, 1976

TO: Nancy Omundson Assistant Director OPD
FROM: Harold Sawyer *HS* Director, Transportation & Distribution
SUBJ: Materials Flow in Unit B/C

UNIV. OF MINN.
HEALTH SCIENCE
PLANNING OFFICE

This memo is to confirm our conversation during the 11:00 am meeting on February 23, 1976 and to establish the framework for a joint Materials Services OPD administration project concerning a materials supply program for Unit B/C.

I am confirming what I indicated at the meeting on February 23, that Materials Services is willing to proceed with the cooperation of OPD personnel to develop a proposal concerning a materials service program for Unit B/C encompassing (but not limited to) such items as; medical supplies, linen supplies, custodial supplies, mail/specimen rounds, Pharmacy IV's, and ARS items.

At the meeting Ms. Dorsey and yourself indicated an interest in such a program and a willingness to pursue the subject further. Materials Services will develop a program proposal using the following outline as a guideline.

Data Collection

A. Use of current B/C plans to establish:

1. Storage areas for each clinic
2. Distance and routes to each clinic
3. Location of after hour secured doors.
4. Physical characteristics of storage areas

B. Interviews with OPD personnel to establish:

1. Level of inventory necessary per area
2. Limitations of storage areas, physical
3. Times of service preferred.
4. Environmental specifications
5. Supplemental service to cover in-betweens

C. Interviews with other support services to estimate:

1. Level of committment currently planned
2. Willingness to cooperate in program
3. Ability to support program
4. Potential distribution systems from each to B/C

D. Materials Services internal discussions to estimate:

1. Cost in manhours to establish service levels desired
2. Support necessary from off-site warehouse
3. Time table for implementation
4. Any distribution equipment purchases necessary
5. Potential routes and services times
6. ICS input necessary to start system
7. Changes and/or ramification to current ICS system
8. Cross charges and criteria for reporting
9. RMS standards

I would appreciate any comments on the outline by March 3, 1976 so that I may present the initial project identification to the Materials Services Advisory Committee on March 4, 1976.

HS/mt

cc: L. Vietti
R. Baker
M. McKee
R. Dickler
D. Johnson
B. Dorsey
G. Kujawa
P. Maupin/R. Swanson

TAC

*Unit B/C - Materials
Transport*

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10 March 1976

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Mr. Robert Dickler
Associate Director
University Hospitals
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Minneapolis, MN 55455

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MAR 15 1976

**UNIV. OF MINN.
HEALTH SCIENCE
PLANNING OFFICE**

Re: Unit B/C Non-Scheduled Materials
Transport System
TAC Job No. 75046

Dear Bob:

We have enclosed a list of the representatives whose equipment is being considered for the non-scheduled materials transport system in Unit B/C and copies of letters which confirm our meetings during 18-19 March.

As you are aware, the systems differ to some extent. The Telelift and Rallypost systems are similar in the use of a continuous one-way horizontal and vertical track with switches and loops to connect all stations. The track is powered in the Telelift system, and the car is (battery) powered in the Rallypost system.

The Distributor, Interlect and Transflex systems are similar in the use of separate horizontal and vertical modes to connect all stations, with transfer devices at the shafts. The Distributor and Interlect systems use twin horizontal or inclined carriageways of powered belts. The Transflex system uses a powered chain within a one-way track assembly.

We are preparing charts and data which will compare other attributes of these systems for our use at the sessions with the representatives, which will be distributed during the preliminary meeting on Tuesday, 16 March.

Very truly yours,

THE ARCHITECTS COLLABORATIVE Inc.

Herman B. Zinter

Herman B. Zinter

HBZ:kyb
Enclosure

cc: P. Maupin, N. Omundson, G. Kujawa, HSAE

UNIT B/C UNSCHEDULED
MATERIALS TRANSPORT SYSTEM

HARDWARE REPRESENTATIVES

Manufacturer's System

Information regarding automated materials transport equipment can be obtained from the following representatives:

Autopage Distributor
Interlect

Mr. James Lehtinen
ADA-BEC Systems Ltd.
730 Waukegan Road
Deerfield, IL 60015
(312) 945-8150

Mr. W. A. Parratt
Montreal

Transflex

Mr. Floyd R. Schultz
Manager
Anchor Conveyors
6906 Kingsley Avenue
Post Office Box 650
Dearborn, MI 48121
(313) 846-6000

Automatic Selective Vertical
and
Rallypost

Mr. Leonard Woods
District Sales Manager
Diebold, Inc.
Lampson Division
37 Brighton Avenue
Allston, MA 02134
(617) 783-2202

Mr. Mark Lunday
Chicago

Telelift

Mr. Les Garb
NE Area Manager
Mosler Airmatic Systems Div.
40 West 40th Street
New York, NY 10018
(212) 484-5482

Mr. Jack Kolb
Chicago



THE ARCHITECTS COLLABORATIVE INC.

10 March 1976

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ROBERT WILSON
LAURENCE ZUELKE

Mr. Les Garb
NE Area Manager
Mosler Airmatic Systems Division
40 West 40th Street
New York, NY 10018

Re: University of Minnesota
TAC Job No. 75046

Dear Mr. Garb:

This is to confirm our arrangement to meet in Minneapolis on Thursday, 18 March at 8:30 am to discuss the possible use of the Telelift system for non-scheduled materials transport in Unit B/C of the Health Sciences.

As background, two brochures are enclosed which partially describe the Health Sciences Expansion at the University of Minnesota, including the general program, master plan, and building system. In addition, a summary of assumptions and data is enclosed to define the projected scope and traffic characteristics of the non-scheduled materials transport system.

Unit B/C is under construction with placement of footings and steel erection now in progress. Substantial completion of the outpatient and medical research facility is scheduled for September 1977.

We are interested in completing the criteria for hardware performance and selecting a transport system as soon as possible, and integrating the engineering and installation phases into the construction logic of the project. To meet this schedule, we request four copies of the following information be available at our meeting:

- . Product information, shop drawings and specifications of system hardware including: dimensions and construction details of stations, shafts, fire dampers, pathways, switches, carriers and controls, or other components.
- . List of installations including: scope of systems, addresses, telephone numbers, and individuals who may be contacted to arrange site visits.
- . Estimated time schedule for engineering, shop drawings, fabrication, delivery, installation and testing of system hardware.

THE ARCHITECTS COLLABORATIVE INC.

Mr. Les Garb
10 March 1976
Page 2

More detailed information about building systems, station locations and pathways will be available for you at our meeting. A tour of Unit A and the Mayo complex will be provided in advance of the meeting with Mr. Robert Dickler, an Associate Director of University Hospitals. We plan to begin the tour at the office of our associates, Health Sciences Architects and Engineers, Inc., 2829 University Avenue, SE, Minneapolis, Minnesota 55414.

Please call if you have any questions. During the week of 15 - 19 March, I can be reached in Minneapolis by telephone at (612) 378-3833.

Very truly yours,

THE ARCHITECTS COLLABORATIVE Inc.


Herman B. Zinter

HBZ:kvb
Enclosures

cc: B. Dickler
P. Maupin ✓
N. Omundson
G. Kujawa
HSAE



THE ARCHITECTS COLLABORATIVE INC.

10 March 1976

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Mr. Floyd R. Schultz
Manager
Anchor Conveyors
6906 Kingsley Avenue
Post Office Box 650
Dearborn, MI 48121

Re: University of Minnesota
TAC Job No. 75046

Dear Mr. Schultz:

This is to confirm our arrangement to meet in Minneapolis on Friday, 19 March at 1:00 pm to discuss the possible use of the Transflex system for non-scheduled materials transport in Unit B/C of the Health Sciences.

As background, two brochures are enclosed which partially describe the Health Sciences Expansion at the University of Minnesota, including the general program, master plan, and building system. In addition, a summary of assumptions and data is enclosed to define the projected scope and traffic characteristics of the non-scheduled materials transport system.

Unit B/C is under construction with placement of footings and steel erection now in progress. Substantial completion of the outpatient and medical research facility is scheduled for September 1977.

We are interested in completing the criteria for hardware performance and selecting a transport system as soon as possible, and integrating the engineering and installation phases into the construction logic of the project. To meet this schedule, we request four copies of the following information be available at our meeting:

- Product information, shop drawings and specifications of system hardware including: dimensions and construction details of stations, shafts, fire dampers, pathways, switches, carriers and controls, or other components.
- List of installations including: scope of systems, addresses, telephone numbers, and individuals who may be contacted to arrange site visits.
- Estimated time schedule for engineering, shop drawings, fabrication, delivery, installation and testing of system hardware.

THE ARCHITECTS COLLABORATIVE INC.

Mr. Floyd Schultz
10 March 1976
Page 2

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Please call if you have any questions. During the week of 15 - 19 March, I can be reached in Minneapolis by telephone at (612) 378-3833.

Very truly yours,

THE ARCHITECTS COLLABORATIVE Inc.


Herman B. Zinter

HBZ:kvb
Enclosures

cc: B. Dickler
P. Maupin ✓
N. Omundson
G. Kujawa
HSAE



THE ARCHITECTS COLLABORATIVE INC.

10 March 1976

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ROBERT WILSON
LAURENCE ZUELKE

Mr. Leonard Woods
District Sales Manager
Diebold, Inc.
Lampson Division
37 Brighton Avenue
Allston, MA 02134

Re: University of Minnesota
TAC Job No. 75046

Dear Mr. Woods:

This is to confirm our arrangement to meet in Minneapolis on Thursday, 18 March at 12 noon to discuss the possible use of a Diebold system for non-scheduled materials transport in Unit B/C of the Health Sciences.

As background, two brochures are enclosed which partially describe the Health Sciences Expansion at the University of Minnesota, including the general program, master plan, and building system. In addition, a summary of assumptions and data is enclosed to define the projected scope and traffic characteristics of the non-scheduled materials transport system.

Unit B/C is under construction with placement of footings and steel erection now in progress. Substantial completion of the outpatient and medical research facility is scheduled for September 1977.

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- Product information, shop drawings and specifications of system hardware including: dimensions and construction details of stations shafts, fire dampers, pathways, switches, carriers and controls, or other components.
- List of installations including: scope of systems, addresses, telephone numbers, and individuals who may be contacted to arrange site visits.
- Estimated time schedule for engineering, shop drawings, fabrication, delivery, installation and testing of system hardware.

THE ARCHITECTS COLLABORATIVE INC

Mr. Leonard Woods
10 March 1976
Page 2

More detailed information about building systems, station locations and pathways will be available for you at our meeting. A tour of Unit A and the Mayo complex will be provided in advance of the meeting with Mr. Robert Dickler, an Associate Director of University Hospitals. We plan to begin the tour at the office of our associates, Health Sciences Architects and Engineers, Inc., 2829 University Avenue, SE, Minneapolis, Minnesota 55414.

Please call if you have any questions. During the week of 15 - 19 March, I can be reached in Minneapolis by telephone at (612) 378-3833.

Very truly yours,

THE ARCHITECTS COLLABORATIVE Inc.



Herman B. Zinter

HBZ:kvb
Enclosures

cc: B. Dickler
P. Maupin ✓
N. Omundson
G. Kujawa
HSAE



THE ARCHITECTS COLLABORATIVE INC.

10 March 1976

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ROBERT WILSON
LAURENCE ZUELKE

Mr. James Lehtinen
ADA-BEC Systems Ltd.
730 Waukegan Road
Deerfield, IL 60015

Re: University of Minnesota
TAC Job No. 75046

Dear Mr. Lehtinen:

This is to confirm our arrangement to meet in Minneapolis on Friday, 19 March at 8:30 am to discuss the possible use of the Distributor or Interlect system for non-scheduled materials transport in Unit B/C of the Health Sciences.

As background, two brochures are enclosed which partially describe the Health Sciences Expansion at the University of Minnesota, including the general program, master plan, and building system. In addition, a summary of assumptions and data is enclosed to define the projected scope and traffic characteristics of the non-scheduled materials transport system.

Unit B/C is under construction with placement of footings and steel erection now in progress. Substantial completion of the outpatient and medical research facility is scheduled for September 1977.

We are interested in completing the criteria for hardware performance and selecting a transport system as soon as possible, and integrating the engineering and installation phases into the construction logic of the project. To meet this schedule, we request four copies of the following information be available at our meeting:

- Product information, shop drawings and specifications of system hardware including: dimensions and construction details of stations, shafts, fire dampers, pathways, switches, carriers and controls, or other components.
- List of installations including: scope of systems, addresses, telephone numbers, and individuals who may be contacted to arrange site visits.
- Estimated time schedule for engineering, shop drawings, fabrication, delivery, installation and testing of system hardware.

THE ARCHITECTS COLLABORATIVE INC

Mr. James Lehtinen
10 March 1976
Page 2

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Please call if you have any questions. During the week of 15 - 19 March, I can be reached in Minneapolis by telephone at (612) 378-3833.

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Herman B. Zinter

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G. Kujawa
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UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

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6 October 1975

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17 November 1975

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UNIT B/C MATERIALS
TRANSPORT SYSTEM

Development of System

The procurement of hardware for a non-scheduled materials transport system within Unit B/C will require the development of an overall plan of operations and involve the following steps:

1. Develop all procedures and operations within Unit B/C which require the dispatch and/or receipt of information and materials by either messenger or mechanized transport.
2. Develop the control and distribution procedures which interface with the management of scheduled and bulk items delivered to Unit B/C via the service tunnel.
3. Identify the items of information and material which are to be included in a non-scheduled transport system.
4. Determine the origin, destination, frequency of transport and special characteristics or requirements of each item within the system.
5. Develop an overall concept of the system and identify all required stations in the mechanized part of the transport system.
6. Develop criteria for the performance and selection of hardware for the materials transport system.
7. Test the installation requirements of proposed hardware with existing building systems.

UNIT B/C MATERIALS
TRANSPORT SYSTEM

Non Scheduled Items

Category	Item	Stat	Security	Special
RECORDS	Medical Records	X	X	
	Lab Reports	X	X	
CORRESPONDENCE	Correspondence Mail Schedules Computer Input Data			
MESSAGES	Admission Forms Orders Prescriptions	X X X		
UNIT SUPPLIES	Clerical Medical Sterile Housekeeping Nutritional			
PHARMACEUTIC	Drugs Medicines Solutions		X X	X
LABORATORY	Specimens Unit Supplies			X
RADIOGRAPHIC	X-Ray Films Radiographs		X	

Scheduled Items

RECORDS	Medical Records		X	
SUPPLIES	Clean Linen, Gowns Uniforms X-Ray Film Clerical Medical Sterile Housekeeping Nutritional Pharmaceutical Chemical & Gaseous		X	
DISPOSABLE/ RECYCLABLE	Trash Soiled Linen Instruments			

UNIT B/C MATERIALS
TRANSPORT SYSTEM

Primary System
List of Stations

Station	Floor	Department	Shell Space
1	1	Clinical Labs	
2	1	Radiology	
3	1	Medical Records	Shell
		Storage	
4	1	Orthopedic/PM & R	
		EKG	
5	1	OB/Gyn	
6	1	Surgery/Urology	
7	1	Ambulatory Surgery/ Proctology	
8	2	Medical Records	Shell
9	2	Admissions	
10	2	Business Office	Shell
11	2	Pharmacy/Social Service	
12	2	Medicine	
13	3	Family Practice	
14	4	Pediatrics/Dermatology	
15	5	Neurology/Neuro- Surgery	Shell
16	6	Psychiatry/Psychology	Shell
17	7	Dental	Shell
18	8	ENT/Audiology	
19	9	Ophthalmology	
20	2	Main Lab (Mayo)	

UNIT B/C MATERIALS TRANSPORT SYSTEM

Hardware Performance Selection Criteria

The following considerations of hardware performance relate to aspects of function, procurement, installation, maintenance, and costs for materials transportation system.

FUNCTION

1. Carrier capacity including dimensions and allowable weight factors
2. Delivery time including rate of travel, availability of carriers and elapsed travel time between stations.
3. Acoustic characteristics at stations and along travel routes
4. Asepsis control in operational and housekeeping procedures
5. Protection for laboratory specimens, fluids and instruments
6. Carrier security for control and safeguard of cargo
7. Simplicity and safety of operation for using personnel
8. Emergency power requirements for continual operation
9. Centralized or decentralized monitoring capabilities

PROCUREMENT

1. Proprietary features which limit market competition
2. Time required for fabrication and delivery
3. Satisfaction of previous installations and operations

INSTALLATION

1. Compatibility with existing building systems and code regulations
2. Space requirements and arrangements for stations and equipment
3. Accessibility of components for repair and replacement
4. Constraints for expansion of system

MAINTENANCE

1. Availability of components and trained service personnel
2. Warranty of system and components during useful life
3. Reliability of system and expectations for downtime
4. Manual alternatives during system malfunctions

COSTS

1. Investment costs including the cost of money
2. Space and construction costs including Change Order costs
3. Utility costs and energy conservation
4. Operating costs including labor, training and insurance
5. Housekeeping costs (contract and institutional)
6. Maintenance and overhaul costs (contract and institutional)
7. Salvage value of purchase.
8. Separate costs for track and station(s) in Mayo.

UNIT B/C MATERIALS
TRANSPORT SYSTEM

DEVELOPMENT OF A SYSTEM: ANALYSIS OF
POLICIES AND PROCEDURES

Medical Records

How are medical records initiated, requested, retrieved, delivered, accounted for, maintained and refiled on an appointment and nonappointment basis?

Central Dictation and
Transcription

What is the projected workload and operating procedure for central dictation and transcription services, including medical records, discharge summaries, diagnostic reports, correspondence and management forms?

Admissions and
Appointments

Which procedures in admissions and central appointments require the transport of records, schedules, and other computerized forms and reports?

Mail and
Correspondence

How is incoming mail to Health Sciences received, acknowledged, sorted and delivered to departments, stations or individuals; how is outgoing mail from each department dispatched to Federal or campus postal services?

Medical Unit Supplies

Which departments or clinics receive medical and/or sterile supplies on a scheduled and nonscheduled basis, how are items ordered, transported and accounted for?

Clerical Unit Supplies

How are administrative forms, clerical and housekeeping supplies ordered, transported and controlled?

Laboratory Reports,
Specimens and Supplies

Which clinics or stations dispatch specimens; what are policies and procedures for the management of orders, specimens, reports and resupply of laboratory items on a scheduled or nonscheduled basis?

Radiographic
Films and Files

Which clinics or stations request and receive radiographs on a scheduled and nonscheduled basis; what are policies and procedures for ordering, retrieving, delivering, returning and re-filing of x-ray files?

Assumptions

The entire Medical Records Department will be located in currently assigned space on Levels 1 and 2 of Unit B/C. Active records will be sent, received and stored on Level 2. The Word Processing Center will be located on Level 1.

Medical records of outpatients with appointments will be delivered by cart to the clinics between 5 am and 6 am daily.

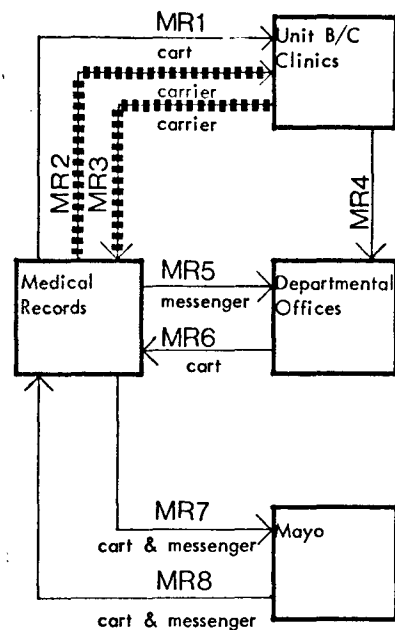
Medical records of outpatients without appointments will be delivered by automated carrier to the clinics upon demand.

Medical records usually will be returned from clinics to active storage within 24 hours. Entries will be made to the medical records by physician during exam in clinic. Charts that accumulate at stations after appointments will be returned by automated carrier throughout the day.

Occasionally, medical records will be sent by messenger from clinics to departmental offices for transcription. Records will then be returned to active storage by messenger. Alternatively, records will be recalled from storage for reference or transcription in departmental offices and be transported by messenger.

Medical record management will continue to include a procedure of signing out (and in) the individual charts being transported from location to location in both the scheduled and non-scheduled systems.

Medical records will be sent by messenger to nursing units, clinics and departments, including emergency, which remain in Mayo Hospital.



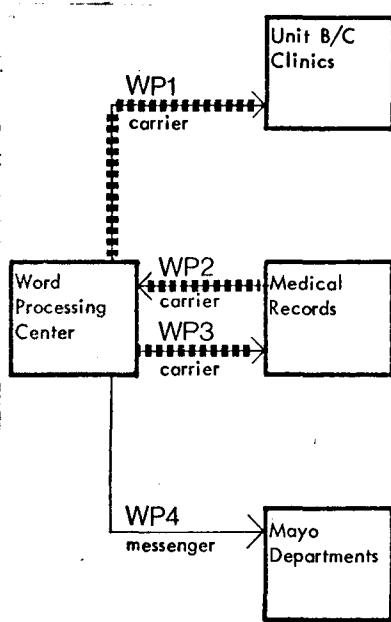
Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
MR 1	Records	500-600	1	X
MR 2	Records	150-200	190-200	
MR 3	Records	800		
MR 4	Records	-	-	-
MR 5	Records	350	1	X
MR 6	Records	-	-	X
MR 7	Records	200		
MR 8	Records	200		

Assumptions

The Word Processing Center will be located on Level 1 in Unit B/C. In general, it will not be the dictation and transcription center for departments other than Medical Records and Radiology.

However, the volume of work will likely increase by including the processing of discharge summaries, management transcription, clinic letters and summaries and pathology reports.



Input will be primarily through the central telephone system to dictation equipment, and transcribed information will be sent by automated carrier within Unit B/C and by messenger to other buildings, principally Mayo Hospital. Deliveries to nursing units will be made by Laboratory personnel. Outpatient radiographic reports will be sent to the Medical Records Department in bulk delivery at the end of each day. Requesting physicians will receive a copy. The medical transcriptionists for radiographic reports will be transferred to the Word Processing Center in the Medical Records Department to provide a 24-hour service.

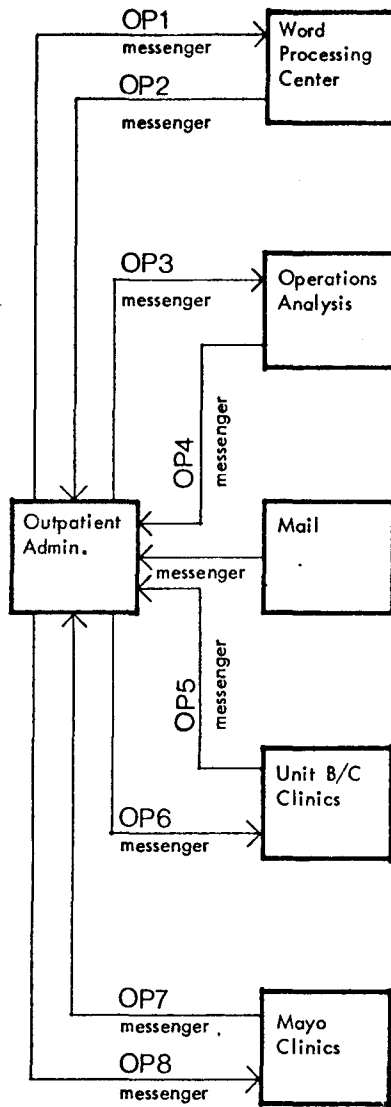
Laboratory reports will be transcribed and delivered by lab personnel. Inpatient reports will be hand-delivered to nursing units and incorporated into charts located at the nurses' stations. Discharged inpatient and outpatient reports will be sent directly to the Medical Records Department in a bulk delivery at the end of each day. Requesting physicians receive a copy. Lab reports will soon be transcribed by computer.

Surgical pathology reports will be transcribed within the department and sent to Medical Records.

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
WP 1	Reports/Forms		1	
WP 2	Records/Forms			
WP 3	Records/Forms		1	X
WP 4	Reports/Forms		1	

Assumptions



Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
OP 1	Forms	20		
OP 2	Forms	20		
OP 3	Schedules		1	X
OP 4	Schedules		1	X
OP 5	Forms			
OP 6	Forms/mail			
OP 7	Forms			
OP 8	Forms/mail			

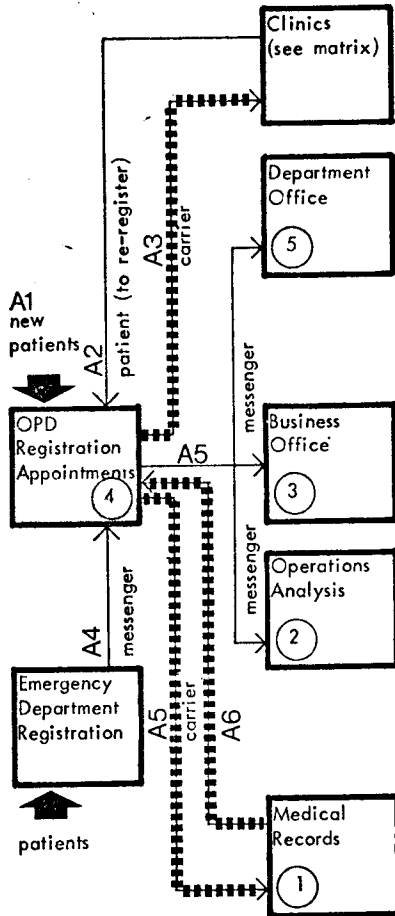
All stenciled forms to be processed will be delivered by messenger from the clinics to Outpatient Administration; forms will then be delivered to the Word Processing Center in Medical Records. Completed forms (100 per week) will be delivered to Outpatient Administration for return to the clinics.

Individual clinic appointment schedules will be delivered to Outpatient Administration each afternoon and then in bulk will be delivered to Operations Analysis by 4 pm before the evening shift. Computer prints of appointment schedules (3 pieces per day per clinic) are delivered to Outpatient Administration at 8 am each morning for distribution to the clinics in Mayo Hospital and Unit B/C.

Mail for clinics (60 pieces per day) will be delivered to boxes in Outpatient Administration. Clinic personnel are responsible to pick-up mail from individual boxes (see Mail Distribution system for schedule).

Small items of equipment (4 per day) will be ordered by clinics through Outpatient Administration, where items will be registered after delivery and distributed to clinics.

Assumptions



Outpatient Registration will consist of offices for registration and appointments and will be located adjacent to the primary pedestrian concourses and Business Offices on Level 2. The Appointment office will receive telephone calls from new patients seeking an appropriate clinic and will arrange for an initial appointment and registration. With the exception of registration in the emergency department, all initial and re-registration of outpatients will be made at this location, usually prior to clinic appointments. Each clinic will independently maintain its appointment schedule.

A new patient will be scheduled to arrive early for the initial clinic appointment and registration (12,000-13,000/year or 20-100/day). A medical record (chart) and patient index number will be issued at the registration office, after a telephone call to the Patient Index file room in Medical Records for the assignment of a number.

Often, patients will be requested to correct out-dated information and return to the registration or admissions office (7,000-8,000/year). Corrections to patient cards or plates also will be requested by telephone from clinics and a new card will then be delivered to the clinic by automated carrier (20-25/day).

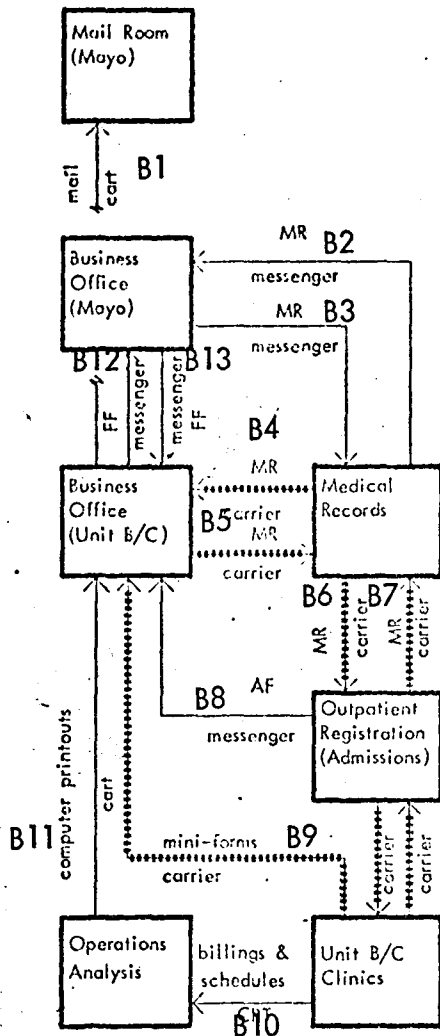
Copies of the Admissions Record will be sent to ① Medical Records, ② Operations Analysis, ③ Business Office and ⑤ the responsible physician (Departmental Office), and one copy ④ will be retained at the Admissions Office for two years.

Medical records (charts) will be sent from the Emergency Department to the Appointment Office to arrange follow-up visits for patients in the clinics (10-40/day).

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
A 1	Patients	20-100	20-100	
A 2	Patients	30	30	
A 3	Card	50-135	25	
A 4	Record	10-40	1	X
A 5	Adm Form	60-175	1	X
A 6	Record	50-55		

Assumptions



Summary of Data

Most Business Office Functions will be located on Level 2 in Unit B/C. Inpatient admission, census and discharge functions will be located on Level 3 in Mayo Hospital.

Requests will be made from the Business Office satellite in Mayo Hospital for medical records and patient financial folders which will be filed in Unit B/C. Information will be transported by messenger unless computer terminals are operational for transmitting such data. Presently, approximately 20 non-scheduled charts per day are transported between Medical Records and Inpatient Admissions.

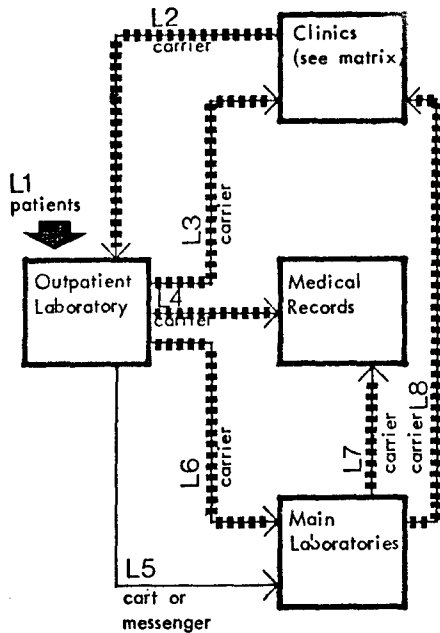
Approximately 60-80 charts per day (in batches of 4 or 5) will be transported from Medical Records to the Business Office. Trips occur mostly in the afternoon and later in the week.

Mini-forms to correct out-dated information will be completed in the clinics and transported to the Business Office by carrier (4-5 trips per day, total).

Computer printouts from Data Processing (approximately 141,000 - 160,000 sheets per month) will be delivered by cart to the Business Office. Most bulk shipments will occur in the morning.

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
B1	Mail			X
B2	Charts			
B3	Charts			
B4	Charts	60-80	12-16	4-5
B5	Charts	60-80	12-16	4-5
B6	Charts	20		
B7	Charts	20		
B8	Adm. Form			
B9	Mini-Form		4-5	X
B10	Billing			
B11	Printouts	8,000		X
B12	Folders			
B13	Folders			

Assumptions



The Outpatient Laboratory will be located on Level 1 in Unit B/C. Five tests will be routinely processed in the Outpatient Laboratory: Hematocrits, hemoglobin, red and white cell counts and differentials.

Outpatients needing tests will come to the Outpatient Lab to leave specimens and approximately 80% of patients will then go to the clinics to await results.

A minimum of specimens and requests, mostly cultures drawn by physicians, will be sent from clinics via an automated transport system.

Specimens not processed in the Outpatient Lab will be transported by cart or automated carrier to the Main Laboratories in Mayo Hospital.

Reports will be sent to the clinic by automated carrier as results become available. This copy is used by the physician and then discarded.

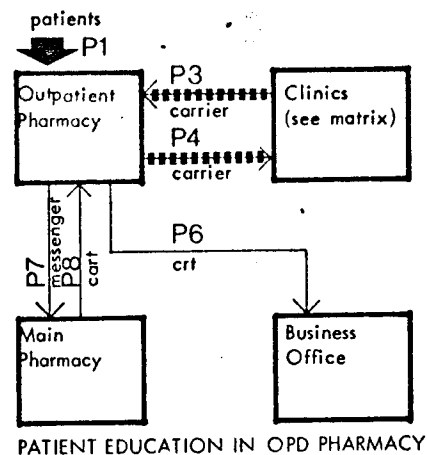
Another copy will be sent to Medical Records by an automated carrier dispatched at the end of the day.

Laboratory results will be computer-transcribed.

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
L 1	Patients	645		
L 2	Specimens	Minimal		
L 3	Reports	137	9	
L 4	Reports	137	1	X
L 5	Specimens	508	9	X
L 6	Specimens		4	
L 7	Reports	508	1	X
L 8	Reports	508	9	

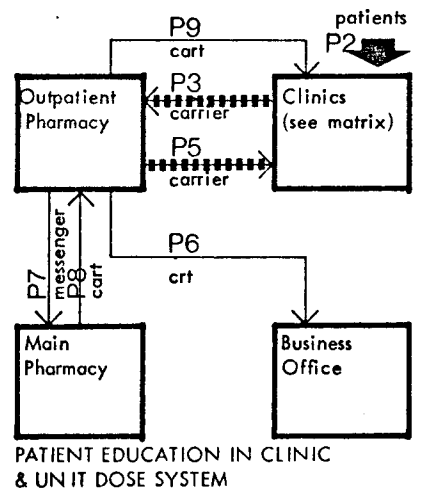
Assumptions



The Outpatient Pharmacy will be located on Level 2 in Unit B/C. After clinic appointments, patients will take prescriptions to Outpatient Pharmacy for processing and self-care instruction. An entry will be made in the patient's medical record at the clinic. Billing information will be transmitted to the Business Office by computer.

Outpatient Pharmacy will not be open after clinic hours, and it will not likely be used by discharged inpatients to fill prescriptions.

A unit dose system will be implemented in which drugs and injections will be prepared for individual dose and distributed by Pharmacy for administration in the clinics.



At present, pharmaceuticals stored in the clinic are restocked by order once or twice a week. With a future unit dose system, prescriptions will be sent to the Outpatient Pharmacy by telephone and/or automated carrier and medicines will be sent by carrier to the clinic for administration.

The automated transport system station at the Pharmacy will not be shared with another service.

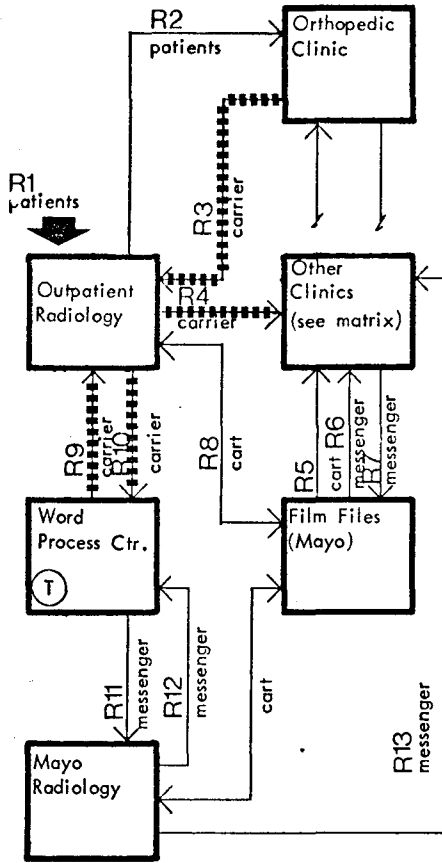
Requests for restocking of the Outpatient Pharmacy will be delivered to the Main Pharmacy by messenger. Bulk orders will be delivered to the Outpatient Pharmacy by cart once a week. Non-scheduled orders will be delivered by messenger once a day.

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
P1	Doses	41	(patients)	
P2	Dose/Inject	86	(patients)	
P3	Orders	86	86	
P4	Injections	45	45	
P5	Dose/Inject	86	86	
P6	Billing	86	86	
P7	Orders		1/week	X
	Orders		1	
P8	Supplies	1 cart	1/week	X
	Supplies	1 cart	1	
P9	Supplies	1 cart	1+/week	X

Assumptions

Outpatient Radiology will be located on Level 1 of Unit B/C. Approximately 100 patients visit Radiology each day. The Orthopedic clinic sends 35-40 patients per day and the other clinics, except Audiology and Eye, send 2-10 patients each.



Patients will carry new X-ray films from Outpatient Radiology to the Orthopedic clinic for use during examination. Films will be returned to Radiology by automated carrier for review by the Radiologist.

Bulk deliveries of old X-ray films will be made by cart once a day from the central files in Mayo Hospital to clinics or Radiology departments.

Non-scheduled requests by telephone, from clinics and Radiology departments, for old X-ray films will be transported by outpatient employees or radiology film desk employees.

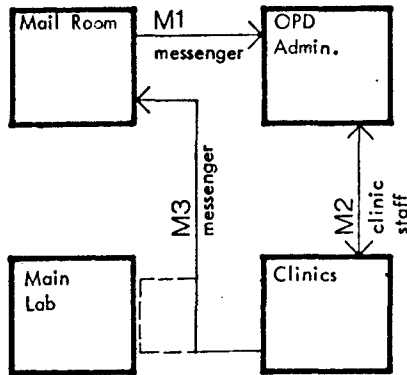
Films will be collected from the clinics by radiology employees at the end of each day.

New and old films will be compared by the Radiologist and reports will be dictated by telephone to transcriptionists in the Word Processing Center of Medical Records. Typed reports will be returned to Radiology departments for signature, sorting and dispatch to the clinics in 1 - 9 days; a second copy will be attached to the film jacket and sent to files in Mayo Hospital; and a third copy will be attached to the medical records. A preliminary report requiring a fourth copy (without signature) will not be used.

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
R1	Patients	100+	100	
R2	Films	40	40	
R3	Films	40		
R4	Film/Report	60+		
R5	Films	100+	1	X
R6	Films			
R7	Film	100+	1	X
R8	Film/Report	100+	1	X
R9	Report Copy	100+		
R10	Report Copy	100+		
R11	Report Copy			
R12	Report Copy			
R13	Report			

Assumptions



The Mail Room, presently located in Mayo Hospital, will be relocated upon completion of Unit B/C. A new location has not been selected.

Federal mail will be delivered to the Mail Room twice a day (6:30 - 7:00 am and 8:30 - 9:00 am), and campus mail will be delivered separately twice a day (8:00 am and 1:00 pm).

Deliveries and collections for nursing units, hospital departments and individuals will begin at 10:30 am and 2:15 pm, and will be made by personnel from the Transportation and Distribution (T & D) department of Materials Services.

Mail for clinics will be delivered to boxes in Out-patient Department Administration. Clinic personnel will be responsible to pick-up mail from individual boxes.

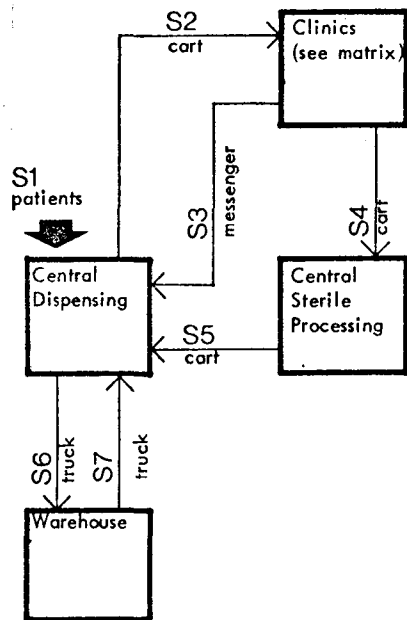
Mail will be collected from clinics by T & D personnel on specimen rounds twice a day.

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
M 1	U S Mail	50	2	X
M 2	U S Mail		2	X
M 3	U S Mail	15	2	X

Assumptions

The Materials Services division is organized to include the departments of Transportation and Distribution (T & D), Central Sterile Processing (CSP) and Purchasing. Operations within T & D include: Central Transportation Service (CTS), Automatic Replacement Service (ARS, Hospital Receiving, Warehouse, and Moving.



Supplies will be delivered to clinics in Unit B/C by personnel from ARS, using computerized order forms which have been completed by the clinic staff. (Presently, the ARS personnel have full responsibility to inventory, order and replace stock for the nursing units in Mayo Hospital.) Medical, sterile and clerical supplies will be delivered by cart to clinics between 6:30-7:00 am, Monday-Friday. (Presently, one fully loaded cart is used to serve all clinics on an average round.) Order forms for the following day will be delivered with each round. Messengers will return forms to Central Dispensing by 5:00 pm and orders will be filled for delivery the next day by 6:00 pm.

Non-scheduled deliveries of supply items to clinics (on a "demand" basis) will be infrequent.

Supplies will be issued at Central Dispensing in Mayo Hospital to outpatients for home care and treatment programs.

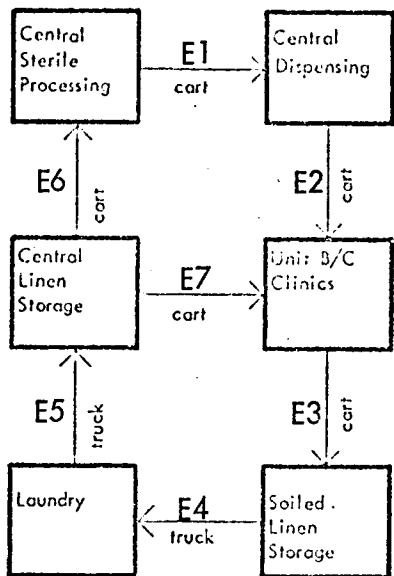
Supplies to be reprocessed are delivered to Central Sterile Processing by messenger.

On Thursday morning, the order forms for warehouse-stored items will be included with the daily form and supplies for each clinic. Warehouse order forms either will be returned by messenger to Central Dispensing or picked up during the Friday morning round. Orders are processed at the warehouse on Friday and delivered to clinics on Monday.

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
S 1	Patients	200	200	
S 2	Supplies	Cart	1	X
S 3	Orders		1	X
S 4	Soiled goods	Cart	1	X
S 5	Sterile goods			
S 6	Orders	Truck	1/week	X
S 7	Supplies	Truck	1/week	X

Assumptions



Linen will be distributed by environmental services personnel to approximately 90 user locations in the University Hospitals and Health Sciences Center. Schedules vary from 1 to more than 5 deliveries per week.

In Unit B/C the storage shelves for linen in clean utility rooms will be maintained on par stock rather than on exchange cart system. Satellite linen rooms will not be provided in Unit B/C.

Sterile linen will be issued to clinics from Central Dispensing (see description of supplies distribution).

Soiled linen will be bagged in the clinics and transported by cart to Soiled Linen Storage once a day.

Clean linen will be transported by truck from the laundry to Central Linen Storage seven times per day.

Summary of Data

Vector in Diagram	Item to be Transported	Items per Day	Trips per Day	Transport in Bulk
E1	Clean Linen			X
E2	Clean Linen			X
E3	Soiled Linen		1	X
E4	Soiled Linen			X
E5	Clean Linen		7	X
E6	Clean Linen			X
E7	Clean Linen			X

Matrix of Trips Between
Transport-System Stations

The automated transport system is to consist of nineteen (19) stations in Unit B/C and one (1) station at the Main Laboratories in Mayo Hospital. The designations for the stations in the matrix below are based on the current architectural plans for Unit B/C. Stations located in shell space are indicated by a light grey tone.

In the summary discussions of the Emmitt Report, dated September 1975, it is recommended that the transport system configuration be amended as follows: delete Station 2 (Radiology), combine Stations 6 and 7 (Surgery/Urology/Ambulatory Surgery/Proctology) and combine Stations 9 and 10 (Admissions and Business Office). A station is not assigned to Out-patient Administration.

The number of trips indicated in the matrix is based on notes from Robert Smith of 20 March 1975 and 5 January 1976, on the Emmitt Report of August 1975, and on notes from meetings with department representatives of November and December 1975.

From Station No:

To Station No:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Clinical Labs	1			?	?	?	?					?	?	?	?					4
Radiology	2		?		10	10	10					10	10	10	10					
Word Process. Ctr.	3		?	1	1	1	1	1				1	1	1	1	1	1	1	1	
Ortho/PM&R/EKG	4		?	1				5			1	1								1
OB/Gyn	5	12		1				8	5		11	5								10
Surg./Urology	6	2		1				7	2		2	2	1							5
Ambul. Surg/Procto	7			1				7	2											
Medical Records	8			1	13	17	1	1			1	10	7	16	7	7	6	23	16	1
Admissions	9			?	?	?	?	1				?	?	?	?	?	?	?	?	
Business Office	10							1												
Pharmacy/Soc Svc	11			1	8		15	1		36		19	10	26	1			6		
Medicine	12	5		1				10	4	2										4
Family Practice	13			1				4	1											1
Pediatrics/Derm	14	2		1				12	1	2	3									5
Neurol/Neuro	15			1				7												
Psychiatry	16			1				2												
Dental	17			1				2												
Audiology/ENT	18			1				7	1			2								5
Ophthalmology	19			1				11												
Main Lab (Mayo)	20				9	9	9	9	1			9	9	9	9					

Trips by Automated Carrier

From descriptions of administrative and operational procedures, the trips in the table below are identified as scheduled or non-scheduled transactions which will use an automated transport carrier between stations. The times projected for dispatching carriers during a typical day indicate periods of peak traffic at 12:00-1:00 and 4:00-5:00 pm.

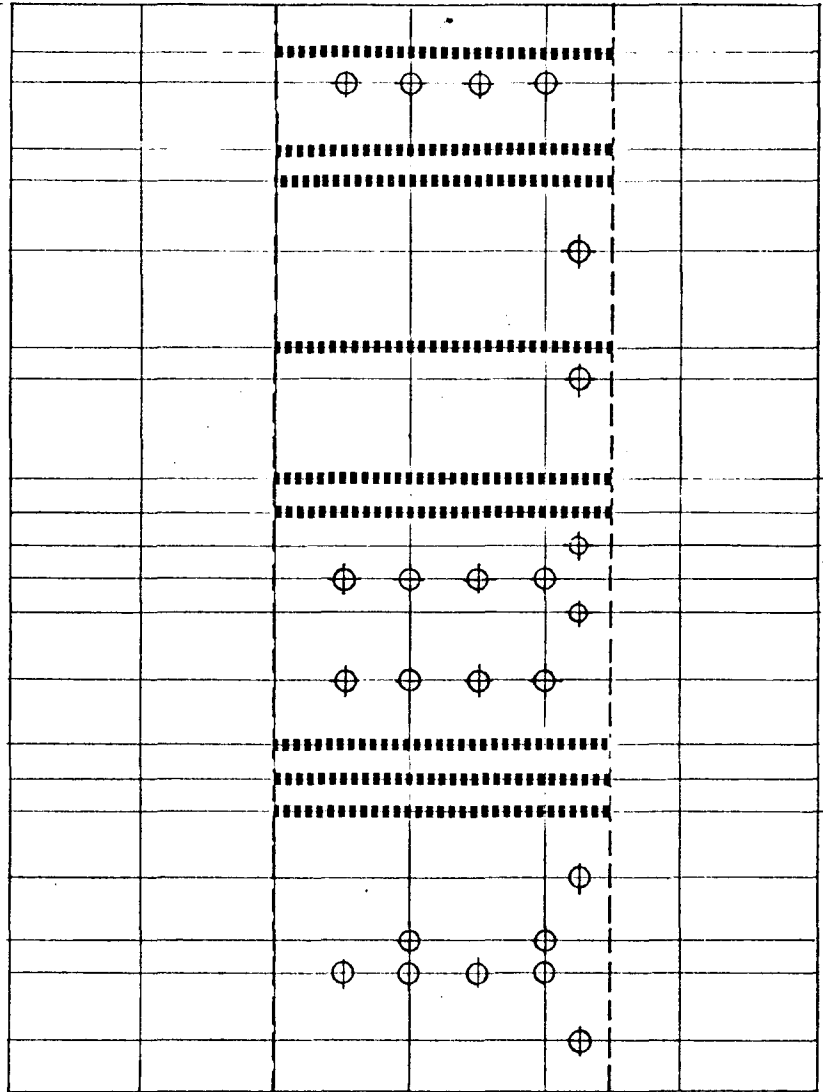
Vector In
Diagram

12:00
Mid

12:00
Noon

12:00
Mid

- MR2 Medical Records to Clinics
- MR3 Clinics to Medical Records
- WP1 Word Process to Clinics
- WP2 Medical Records to Word Process
- WP3 Word Process to Medical Records
- A3 Registration to Clinics
- A5 Registration to Medical Records
- L2 Clinics to OP Lab
- L3 OP Lab to Clinics
- L4 OP Lab to Medical Records
- L6 OP Lab to Mayo Lab
- L7 Mayo Lab to Medical Records
- L8 Mayo Lab to Clinics
- P3 Clinics to OP Pharmacy
- P4 OP Pharmacy to Clinics
- P5 OP Pharmacy to Clinics
- R3 Ortho Clinic to OP Radiology
- R4 OP Radiology to Clinics
- R9 Word Process to OP Radiology
- R10 OP Radiology to Medical Records



clinic hours

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

FREQUENCIES OF TRANSPORT

Trips Between Unit B/C
and Mayo Hospital

From descriptions of administrative and operational procedures in Unit B/C and Mayo Hospital, the trips in the table below are identified as scheduled or non-scheduled transactions which will require the use of messengers or delivery personnel.

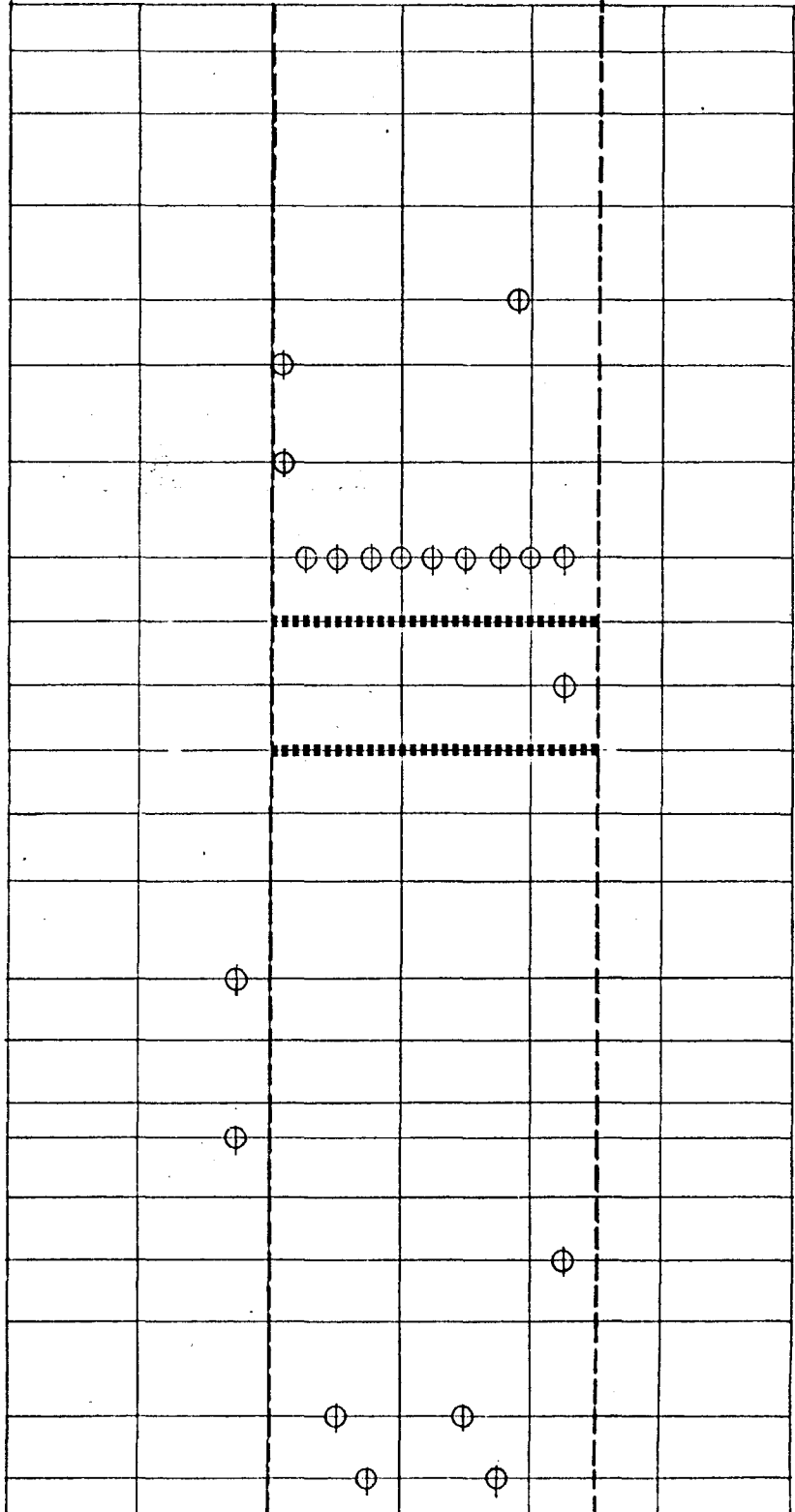
Vector in
Diagram

12:00
Mid

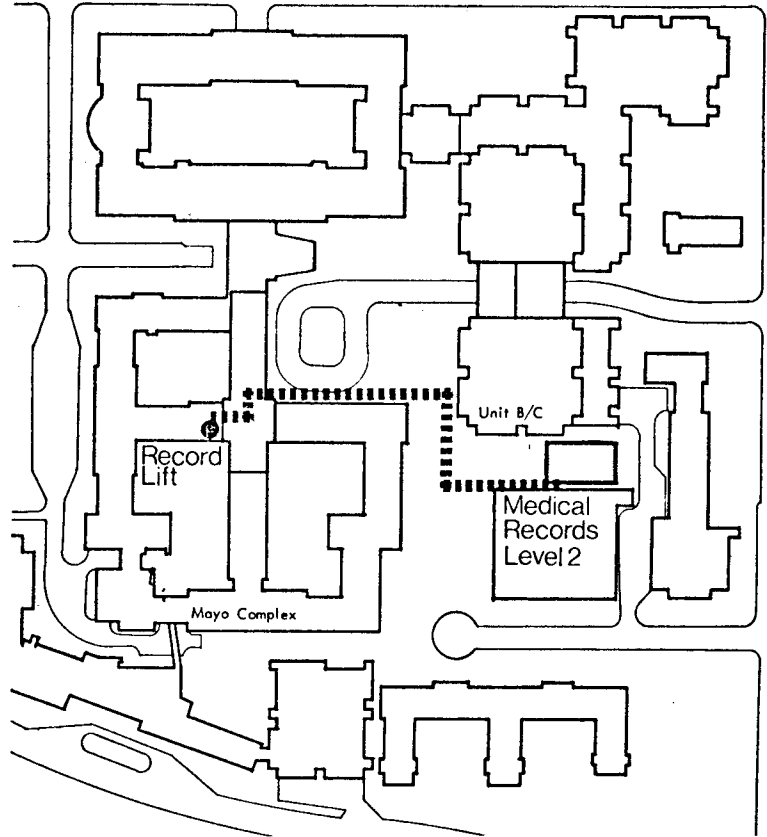
12:00
Noon

12:00
Mid

- MR7 Medical Records to Mayo Departments
- MR8 Mayo Departments to Medical Records
- WP4 Word Process to Mayo Departments
- OP7 Mayo Clinics to OP Administration
- OP8 OP Administration to Mayo Clinics
- A4 Emergency Department to Registration
- L5 OP Lab to Main Lab (bulk)
- L6 OP Lab to Main Lab (stat)
- L7 Main Lab to Medical Records
- L8 Main Lab to Clinics
- P7 OP Pharmacy to Main Pharmacy
- P8 Main Pharmacy to OP Pharmacy
- R5 XR File to Clinics (bulk)
- R6 XR File to Clinics (stat)
- R7 Clinics to XR File
- R8 XR File to OP Radiology
- R11 Word Process to Mayo Radiology
- R12 Mayo Radiology to Medical Records
- R13 Mayo Radiology to Clinics
- M1 Mail Room to OP Administration
- M3 Clinics to Mail Room

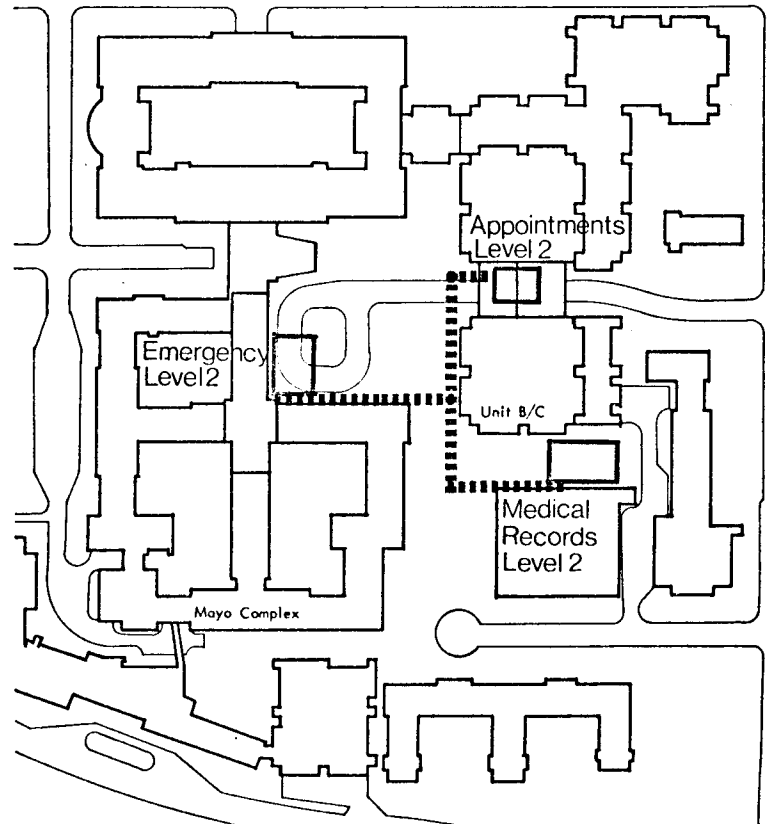


Medical Records Department to
University Hospitals (Mayo)



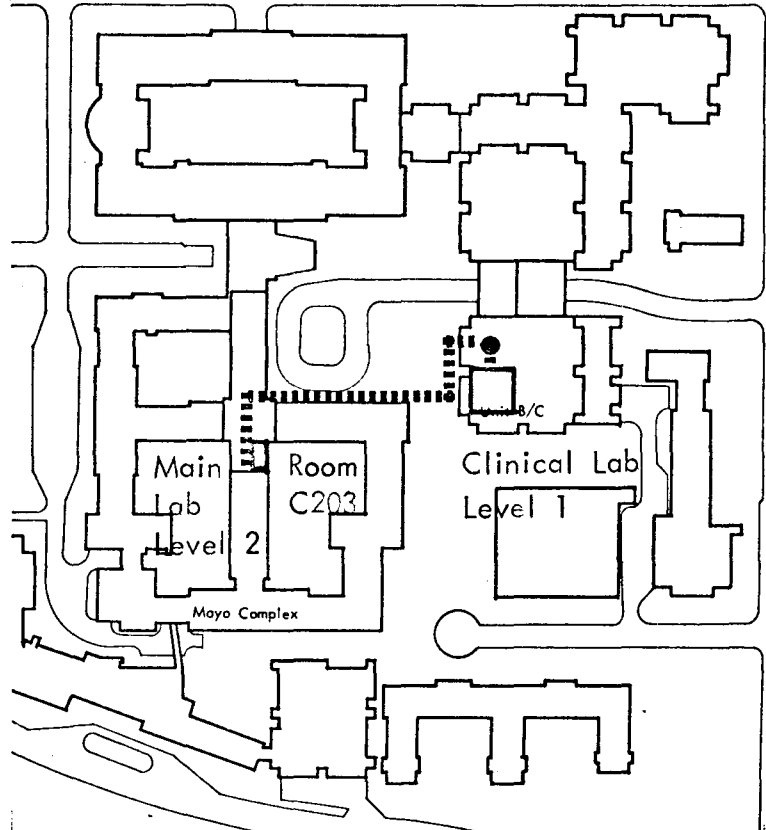
Round Trip Travel Distance = 1100 feet (5.5 minutes)

Emergency Department to
Medical Records



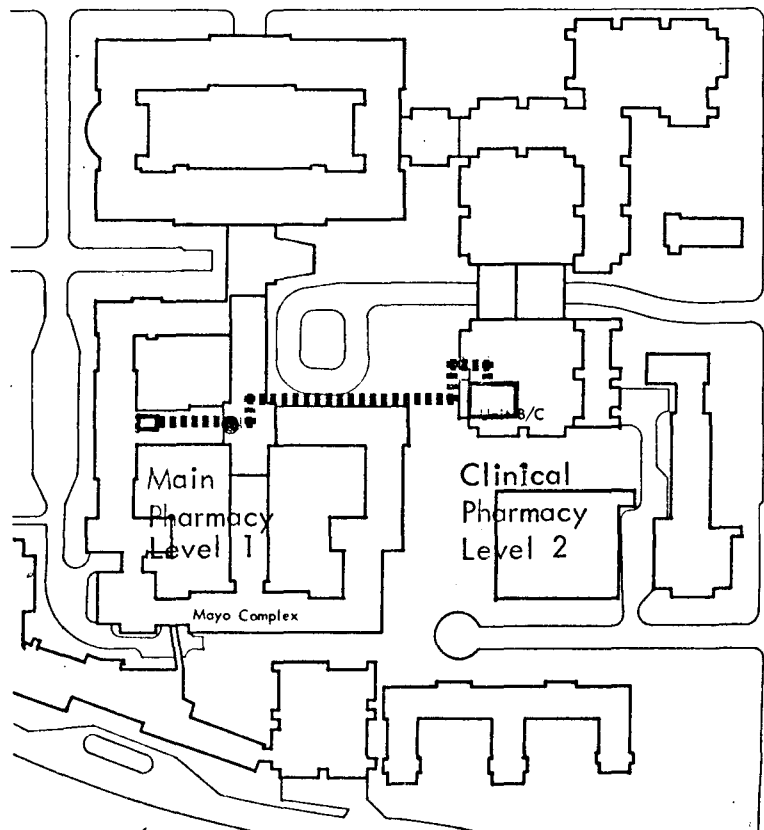
Round Trip Travel Distance = 920 feet (4.6 minutes)

Outpatient Laboratory to
Main Laboratory (Mayo)



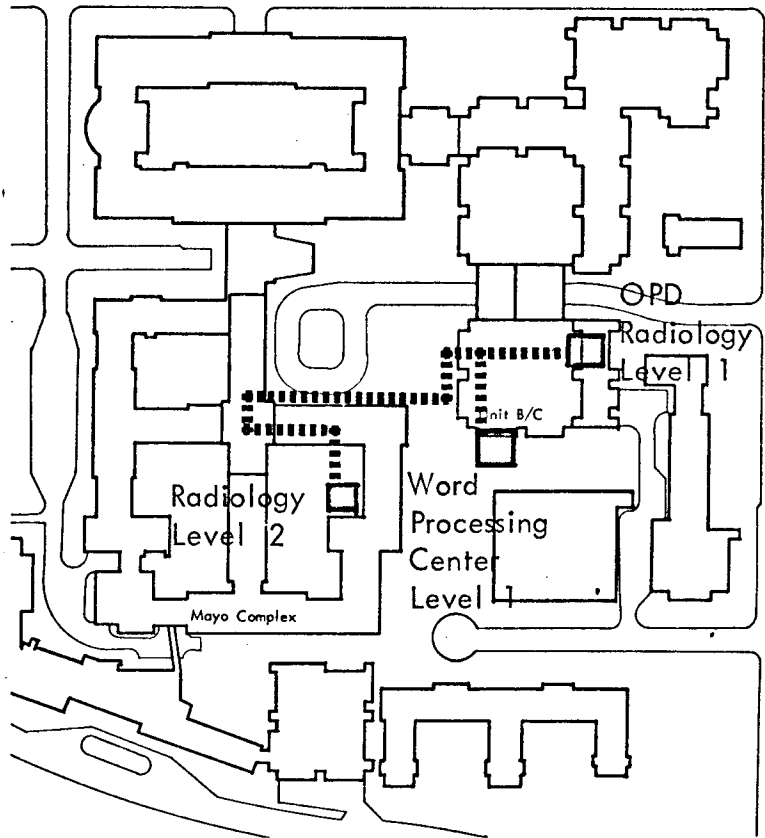
Round Trip Travel Distance = 920 feet (6.6 minutes)

Outpatient Pharmacy to
Main Pharmacy (Mayo)



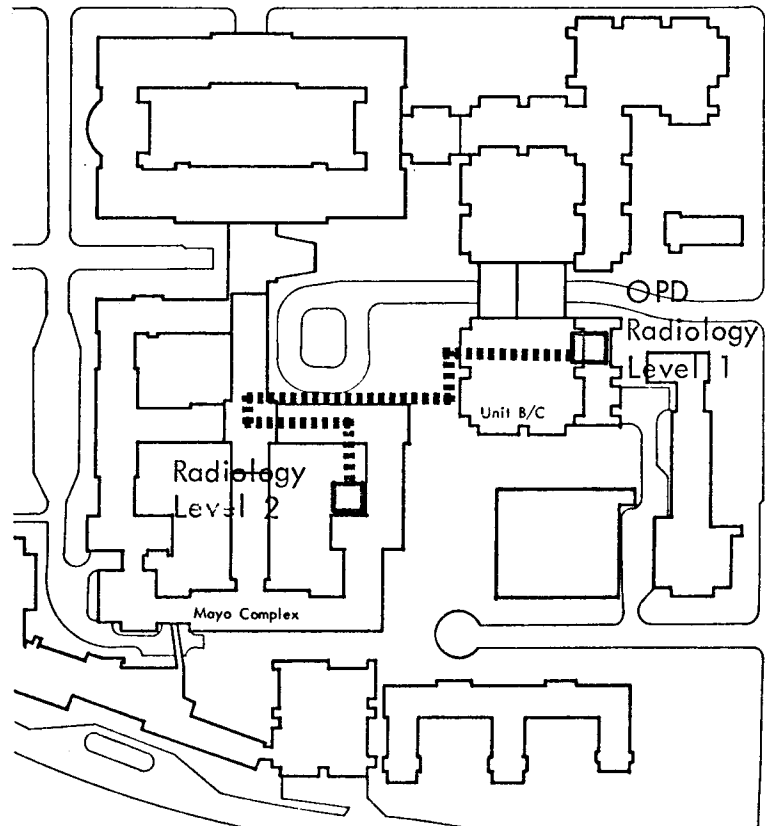
Round Trip Travel Distance - 1000 feet (7.0 minutes)

Word Processing Center to
Main Radiology (Mayo)



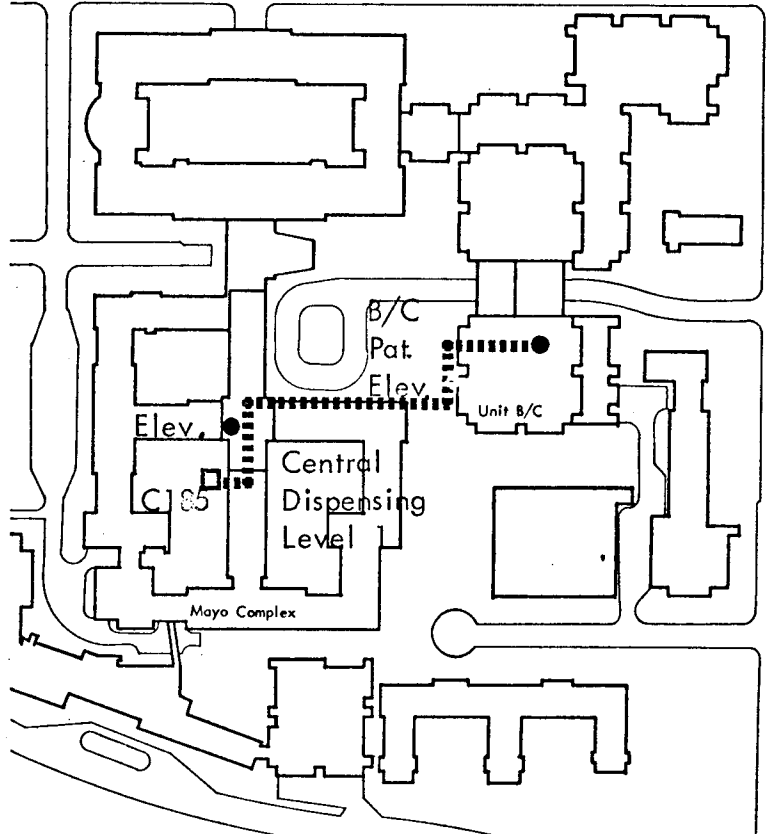
Round Trip Travel Distance = 1300 feet (8.5 minutes)

Outpatient Radiology to
Film Files (Mayo)



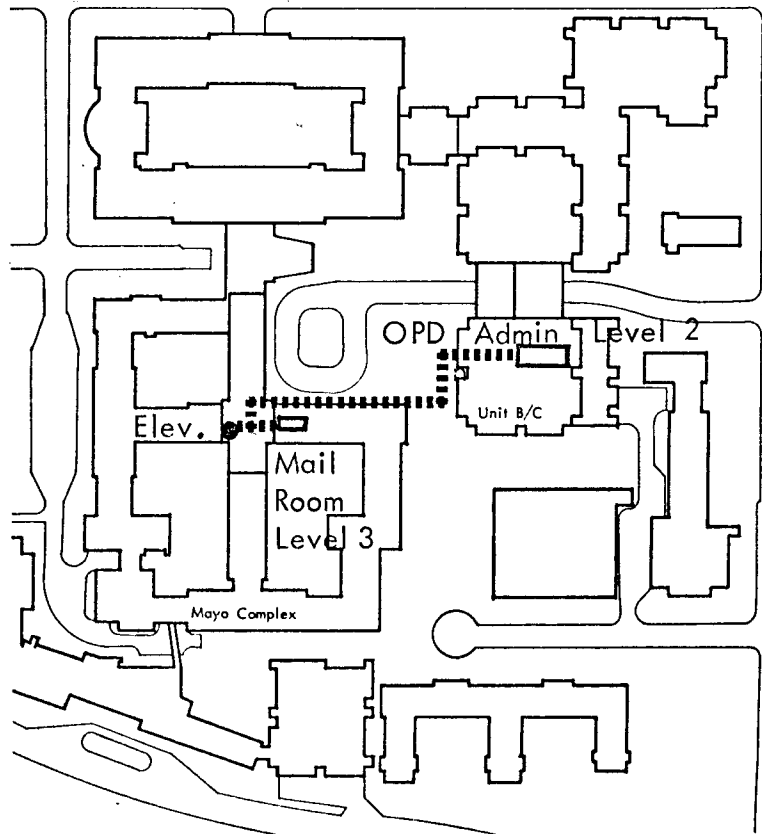
Round Trip Travel Distance = 1400 feet (9.0 minutes)

Outpatients in Unit B/C to
Central Dispensing (Mayo)



Round Trip Travel Distance - 1140 feet (7.7 minutes)

Mail Room to Unit B/C
Outpatient Administration



Round Trip Travel Distance = 860 feet (6.3 minutes)



Paul Maupin
Sept. 28/76.

THE ARCHITECTS COLLABORATIVE INC.

JEAN B. FLETCHER
1945 1965
WALTER GROPIUS
1945 1969
NORMAN FLETCHER
JOHN C. HARKNESS
SARAH P. HARKNESS
LOUIS A. McMILLEN

RICHARD BROOKER
ALEX CVIJANOVIĆ
HERBERT GALLAGHER
WILLIAM J. GEDDIS
ROLAND KLIVER
PETER W. MORTON
H. MORSE PAYNE
ERNEST L. BIRDSALL
TREASURER

ROBERT F. CRANE
HOWARD ELKUS
ALLISON GOODWIN
BASIL HASSAN
JOHN HAYES
JOSEPH HOSKINS
LEONARD NOTKIN
RICHARD SABIN
DAVID SHEFFIELD

QAZI B. AHMED
ROBERT BARNES
KENDALL P. BATES
SERGIO BERIZZI
SERGE CVIJANOVIĆ
ROYSTON DALEY
ROBERT DE WOLFE
GREGORY DOWNES
GAIL HAVIARAS
THOMAS LARSON
RALPH MONTGOMERY
PERRY NEUBAUER
MICHAEL PRODANOU
RICHARD PUFFER
WALTER ROSENFELD
JOHN J. SCOTT
EDMUND SUMMERSBY
KENNETH TAYLOR
MALCOLM TICKNOR
ROBERT TURNER
ROBERT WILSON
LAURENCE ZUELKE

23 September 1976

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SEP 27 1976

UNIV. OF MINN.
HEALTH SCIENCE
PLANNING OFFICE

Mr. Paul J. Maupin
Health Sciences Planning Coordinator
University of Minnesota
4104 Powell Hall
Minneapolis, Minnesota 55455

Regarding: University of Minnesota
Health Sciences Expansion
Unit B/C - Materials Transport System
TAC Job #750

Dear Paul:

As requested in our meeting of 2 September 1976 we are writing to indicate the reasoning behind our suggestion that the contractor who will supply and install the Unit B/C non-scheduled materials transport system be solicited through direct negotiation rather than through standard bidding procedures.

As you know, the Unit B/C construction documents which the University received bids on 3 December 1976 did incorporate and delineate the horizontal and vertical pathway requirements of one specific system and vendor, namely Telelift as manufactured by Mosler Airmatic Systems.

Since that time we have been evaluating various materials transport systems which could be used in Unit B/C by University Hospitals for the transport of small or unit items on a non-scheduled basis. Our efforts have involved gathering and evaluating data received from the vendors directly and that acquired through site visits to manufacturer's plants and other institutions which have such systems in operation. Our analysis concentrated on three belt conveyor systems with box carriers, two rail guided systems with powered carriers and one chain driven system with box carriers.

The systems and manufacturers were as follows:

- | | | |
|---|-----------------------|------------------------------------|
| ✓ | Pathfinder | by Sovex-Marshall |
| ✓ | X Distributor | by Ada-Bec Systems, Ltd. |
| ✓ | X Horizontal/Vertical | by Diebold Inc., Lamson Division |
| ✓ | → Telelift | by Mosler Airmatic system Division |
| | X Rallypost | by Diebold Inc., Lamson Division |
| | X Transflex | by Anchor Conveyors |



THE ARCHITECTS COLLABORATIVE

Page 2
Paul Maupin
23 September 1976

Each of the systems and their individual components differ physically, technically and operationally from one another and must therefore be independently evaluated against the criteria established by University Hospitals and ourselves. In addition, each system studied is proprietary in nature. For these reasons it is impossible to establish a bidding situation whereby one system is the base bid and the others are approved equals. The only bidding option seems to be to establish one system as the base bid and allow the others to be considered unequal alternates submitting bids as such. *This still requires a subjective judgement be made by the Owner regarding contract award.

In the attached document entitled Unit B/C Non-Scheduled Materials Transport System Part 3: Summary of Proposals, 28 June 1976, the specifics of each system, it's equipment, operational characteristics, pathway location etc., are indicated and compared to the establish design criteria. The preliminary findings contained therein recommended for various reasons, that three vendors be dropped from further consideration and that specifications and bid documents be prepared with a belt type of conveyance system as the base bid and that the other system be bid as an alternate.

Since submission of our report a number of changes have occurred which modify the recommendations contained in the report. These changes have prompted and support our present recommendation to negotiate directly with a particular vendor. These changes are as follows:

Distributor by
Adlabac

1. The financial resources of one of the vendors have been over extended due to a number of contracts which have not yet been completed. The scope of our project, considering his present situation, would exceed his current bonding limits, therefore his ability to sign a new contract is restrained by his completion of present contracts and their limits of liability. A discussion on 13 August 1976 with the vendor indicated that if offered a contract with the University, he could not sign such within the time frame we outlined to him. We conclude that he must therefore be dropped from further consideration.
2. Another vendor, although able to enter into an agreement does not yet have an installation of the type he proposes for Unit B/C in operation in the United States. It should be noted that the entire system including controls, is manufactured in Europe. It appears to various Hospital personnel and ourselves that the system is still in the research and development stage. In addition, this vendors preliminary proposal did not adequately respond to the information we requested he supply us for our evaluation.



THE ARCHITECTS COLLABORATIVE

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Paul Maupin
23 September 1976

Since the data submitted by the vendor is very incomplete, coupled with the fact that the system is not operational, we must assume that the system is not yet a reliable one which can meet the establish design criteria and therefore recommend that it be dropped from further consideration.

3. Finally, a change in the Unit B/C construction schedule allowed the start date of rough-in work on Floors One and Two for the HVAC and plumbing trades to occur 9 - 10 months earlier than originally anticipated by the construction schedule. As you know, the rough-in work has already been completed on Floor One, a critical floor for the Material Transport System since this is the floor on which the primary horizontal travel pathway is located. Due to the noted construction change, together with the work already in place, the fabrication and installation schedule for any material transport system being considered is now critical as it affects the installation of the building ceiling system and other finishing work.

For these reasons, together with the data and analysis contained in the attached document, we recommend negotiation with the one remaining viable system and vendor. We believe concurrence with our recommendation should foster;

1. the least time schedule conflicts with on-going construction activities and schedule.
2. the least modification to the M.T.S. pathways delineated on the Unit B/C Construction Documents.
3. minimal change order costs resulting from interface conditions with other contracts.
4. minimal impact on the M.T.S. vendor's preliminary proposal and the costs contained therein.

In closing, we believe the magnitude of the M.T.S. contract as noted in the preliminary proposal (\$550,000) could be reduced through direct negotiation.



THE ARCHITECTS COLLABORATIVE

Page 4
Paul Maupin
23 September 1976

We await your direction on this matter and also wish to be advised of any University policies or procedures regarding negotiation should you concur with our recommendation.

Very truly yours,

THE ARCHITECTS COLLABORATIVE, INC.

John J. Scott
John J. Scott
l.jg

cc: Clint Hewitt
E.A. Kogl
Robert Dickler
Tom Jones
HSAE

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

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General

The purpose of this report is to summarize and evaluate the information obtained from site visits and proposals by vendors to install a non-scheduled materials transport system in Unit B/C.

The background information about basic economic constraints, assumed administrative procedures and performance criteria for the system is contained in Appendix 1.

A comparative analysis of the systems, including aspects of functions, procurement, installation, maintenance and costs is contained in Appendix 2.

This report concerns the performance characteristics of the following materials transport systems:

- PATHFINDER (Sovex-Marshall)
- DISTRIBUTOR (Ada-Bec Systems, Ltd.)
- TELELIFT (Mosler Airmatic Systems Division)
- RALLYPOST (Diebold Inc., Lamson Division)
- HORIZONTAL/
VERTICAL (Diebold Inc., Lamson Division)
- TRANSFLEX (Anchor Conveyors)

Preliminary Findings

The preliminary findings which follow are based on product data, initial vendor proposals, meeting notes and site visits:

1. The Rallypost system is temporarily unavailable for procurement. Diebold indicates that further contracts will not be accepted through December 1976 and that a firm date for remarketing has not been projected.
- OK.* The Telelift (Mosler) system is the only rail-guided, powered-carrier system which is available at this time.

2. In addition to Telelift, two systems which combine lightweight horizontal belt conveyors with vertical lifts are suitable and available for procurement. The Distributor (Ada-Bec) and Pathfinder (Sovex-Marshall) systems are generally accommodated within the present pathway layout and station configurations, assuming slight modifications to slab opening dimensions and/or locations

1. However, Ada-Bec indicates that due to current commitments full performance bonding can be obtained only after August 1976.

3. The Horizontal/Vertical (Diebold) system also combines horizontal belt conveyors with vertical lifts but uses larger and heavier components to provide more handling capacity for bulk items than the Pathfinder, Distributor or Telelift systems.

Preliminary investigation indicates that the larger pathway dimensions are generally accommodated within the ceiling space of Unit B/C, but redesign and change orders of shafts, slab-openings and stations are more extensive than are required for the smaller systems.

The estimated total installation and change order costs on a preliminary basis indicate that the Horizontal/Vertical (Diebold) system exceeds the projected costs for the Telelift, Distributor and Pathfinder systems by approximately \$256,000 to \$309,000.

Based on comparative performance of the system, the allowable project budget and criteria which assumes a primary requirement to transport relatively small amounts of non-scheduled items, the system is not recommended for installation in Unit B/C.

4. When limited to the transport of non-scheduled items on a demand basis, the Transflex (Anchor) system is not suitable for installation in Unit B/C due to several factors: the extent to which modifications are required in existing pathway and station layouts, the high initial cost indicated for fabrication and installation, and its general performance when compared with other systems.

Other factors for not considering procurement of the Transflex system include the urgency of Unit B/C construction and the time available for change orders, the length of time required to reformulate a comprehensive plan for materials management in the Health Sciences complex that incorporates the advantages of such a system, and the general status of engineering and operational experience with the system as presently developed.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

Recommendations

Based on the preliminary findings and conclusions and on the comparative data in Appendix 2, the following recommendations are made for procuring a system through bidding:

1. Prepare specifications and bidding documents to include the Pathfinder (Sovex-Marshall) and Distributor (Ada-Bec) systems, with the Telelift (Mosler) system as an alternate.
2. Issue a change order that temporarily defers the casting of slab openings for stations on Floors 3 through 9, to provide adequate clearances for any of the above systems..
3. Develop plans, sections and details as bidding information to describe conditions for constructing one station on Levels 1 and 2 in Mayo Hospital, adjacent to the present record lift room.
4. Proceed with schematic floor plans to relocate the following transport system stations (and slab openings where applicable):

Station 3	Word Processing Center
Station 8	Medical Records
Station 9	Admissions
Station 10	Business Office (combined with Station 9)
5. Modify the system configuration as listed in the Emmett Study as follows:
 - a. Retain Station 2 (Radiology)
 - b. Retain Station 7 (Ambulatory Surgery)
 - c. Combine Stations 9 and 10 (Admissions/Business Office)
 - d. Add a station at the record lift room on Level 1 in Mayo Hospital, below Station 20 on Level 2.
6. Designate Station 8 (Medical Records) as the system reject station.
7. As a deduct alternate, delete all system hardware at Stations 15, 16, and 17 (Levels 5, 6, and 7) for a potential cost reduction of \$12,000 - 15,000.

Unit B/C Drawings

The contract documents for Unit B/C, dated 2 September 1975, provide for a system of 19 stations on Levels 1 through 9 by reserving space and openings for vertical and horizontal pathways, shafts and stations. The pathway configuration is based on track or rail-guided powered carriers and equipment, such as the Telelift (Mosler) or Rallypost (Diebold) systems. All items of system hardware, fire dampers and electrical distribution are excluded from present contract work.

Emmett Study

An economic justification of a complete system, contained in the Emmett Study and Summary Discussion of August 1975, recommends only 13 stations in Unit B/C, 1 station in Mayo Hospital and a separate point-to-point system connecting stations assigned to the Medical Records department on Levels 1 and 2 in Unit B/C. Stations which are located in shell space, including Station 10 (Business Office), Station 15 (Neurology/Neurosurgery), Station 16 (Psychiatry/Psychology) and Station 17 (Dental) are omitted from the system. Stations which are projected to be underutilized, such as Station 2 (Radiology) and Station 7 (Ambulatory Surgery) also are omitted.

The economic analysis is based on estimated costs for the system which range from \$370,000 to \$430,000, escalated through December 1977, and on a projected life expectancy for the system of 15 years. Cost estimates are based on information obtained from representatives of Mosler (Telelift), Diebold (Rallypost) and Ada-Bec (Distributor and Interlect) systems.

The study projects a savings of personnel in the Medical Records, Outpatient Administration, Pharmacy and Laboratory departments, assuming a commitment to use an automated system for transporting non-scheduled charts, records and unit-dose drugs to clinics within Unit B/C and specimens to the main laboratories in Mayo Hospital.

Summary Discussion

The Summary Discussion of the Emmett Report concludes that further investigation is required to identify other and potential uses for the system and to confirm the number and location of stations; specifically:

- Establish a need for a station in Outpatient and/or Main Radiology to distribute x-ray film files.
- Establish a need for a station in Outpatient Administration.
- Establish a need for separate station in Business Office or the feasibility to combine stations at Outpatient Admissions (by providing an annunciator signal).

- Determine the feasibility to combine the station at Ambulatory Surgery with Surgery/Urology (by providing an annunciator signal).
- Determine the feasibility to vertically realign or horizontally combine other stations which are proximate at levels 1 and 2 to achieve installation cost savings.

Secondly, further investigation is required to identify all suitable hardware systems and compare aspects of the equipment that pertain to function or operation with assumptions noted in the Emmett Study; namely:

1. Estimate the projected elapsed time intervals between stations for dispatch and receipt of items, based on the rate(s) of travel, availability of containers and reliability of the system.
2. Determine the acoustic characteristics at stations and along travel routes, particularly where the pathway passes above the ceiling over examination and consultation rooms.
3. Estimate the initial installation costs of the system, additional change order costs to the owner, and the projected annual maintenance and operating costs.

Summary of Assumptions

Operational plans for the non-scheduled materials transport system, indicating commitments on a departmental basis to use the system, are described in the Summary of Assumptions, dated January 1976 and revised in March 1976. The assumptions are based on information contained in memoranda and notes of meetings with administrative staff members during the period October-December 1975.

In the summary, transactions between administrative, diagnostic and supply departments and the outpatient clinics in Unit B/C are described and separately diagrammed to identify items that will be transported by automated carrier. The projected number of items and the number of trips per day are tabulated to indicate the traffic characteristics at each department.

Administrative Transactions

Transactions with administrative departments, including Medical Records, Word Processing Center, Outpatient Administration, Outpatient Registration and Business Office, will almost exclusively involve the transport of paper such as admission forms, patient charts, reports, correspondence or computer forms. The following factors are noted:

1. The prime use of the system will be to transport medical records from file storage to clinics on a non-scheduled basis.
2. In consolidating file storage and record processing at Level 2 in the Medical Records department, and assigning transcription and research functions to Level 1, the separate point-to-point pathway of the materials transport system (as justified in the Emmett Report) can be deleted.
3. To promote use of the system, the elapsed time between the request of a non-scheduled medical record and its receipt at the particular clinic must be minimized.
4. When returning medical records in bulk from clinics to file storage (or in transporting bound computer forms) there is a potential to exceed the rated weight capacity of small carriers.

Laboratory Transactions

Most of the transactions at Outpatient Laboratory will involve the transport of specimens over an extended and circuitous pathway to the main laboratories in Mayo Hospital. The following factors are noted:

1. To control the spread of infection, spillage of potentially contaminated specimens must be prevented enroute, by securing a lid on all specimen containers, maintaining the specimen in an upright position, and/or sealing the lid on the automated carrier. A special insert is required to hold the specimen container(s) within the carrier.
2. The carrier and insert must be cleaned or sterilized periodically.
3. The specimen must be safeguarded against excessive speed and motion, or damage from impact during travel along the pathway.
4. The elapsed time between dispatch and receipt of specimens in "stat" conditions must approximate messenger service if the transport system is to be used.

Pharmacy Transactions

Most of the transactions at Outpatient Pharmacy will involve transport of unit-dose drugs or injections to clinics in Unit B/C. The following factors are noted:

1. The item to be transported must be cushioned from damage enroute, requiring a special insert for the carrier.
2. A latched cover, preferably with a lock, is requested by pharmacy personnel to ensure the control of drugs enroute to clinics.
3. To promote use of the system and minimize the number of patients waiting in the clinics, the elapsed time required to deliver prescriptions must be equivalent to messenger service.

Radiology Transactions

Many of the transactions with Outpatient Radiology involve the transport of reports for signature and distribution to clinics or files. However, the capability to transport x-ray film files is most critical to including this station in the system. The following factors are noted:

1. To promote use of the system in transporting x-ray film files, the carrier proportions must accommodate file jackets, measuring 14-1/2 x 17 inches, without creasing the films. Taldift Box = 8" x 12" x 18"
2. To avoid overloading by users, the rated weight capacity of the carrier must be proportionate to the volume of film jackets which can be transported at one time.

Supply Transactions

The present plans for material management at University Hospitals do not include the use of an automated transport system for delivery of mail, medical and sterile supplies or linen. However, the volume and weight capacity or availability of carriers may be factors if the following modifications are made in the arrangements:

1. By adding a station at Level 1 near Central Sterile Processing or Central Dispensing in Mayo Hospital, medical and sterile solutions and supplies can be dispatched to stations in Unit B/C, by carrier.

2. The turnover rate of medical supplies and the limited amount of storage space available in clinics may require more frequent delivery of non-scheduled items than now assumed.
3. Future relocation of the present mail room to space adjacent to a transport system station in Mayo Hospital will facilitate the dispatch (and collection) of mail and correspondence to departments in Unit B/C, particularly the Business Office.

Inventory of Trips per Day

The projected number of daily trips between currently assigned department and clinic stations in Unit B/C are summarized in a matrix to identify stations of highest use and to indicate total system traffic. The data is compiled from several sources and is generally based on present hospital operations.

A total of approximately 600-700 trips per day is indicated in the matrix. Assuming that all transactions occur within the 10 hour period of clinic operation, the system will be transporting an average of 60-70 carriers per hour.

Frequencies of Transport

The frequencies of trips within Unit B/C and between Unit B/C and Mayo Hospital are diagrammed to indicate the extent that carriers may be dispatched on a scheduled basis (and induce "peak-load" conditions).

The policy of scheduling dispatches, or accumulating items to be sent for bulk dispatch, is used primarily to conserve messenger services. However, the tendency to "schedule" dispatches will likely be reduced where carriers are available at a particular station for immediate dispatch of records or specimens, or where accumulated carriers need to be returned to home or reserve stations to keep the local station open. Where lab specimens or results (reports) are now held for messengers while patients wait, it is expected that by fully utilizing the system, the waiting intervals can be reduced.

Typical peak-traffic periods, which are due to unscheduled appointments, are identified by department as follows:

Medical Records	9:00-10:00 AM	1:00-2:00 PM
Outpatient Radiology	10:00-11:00	12:00-2:00
Outpatient Laboratory	7:30- 8:30	3:30-4:30

Connection Between
Unit B/C and Mayo Hospital

Many of the daily transactions between departments in Unit B/C and Mayo Hospital involve the transport of items by messenger, either on a demand or scheduled basis. The particular routes between departments are diagrammed to determine the travel time for each round trip. Using the same criteria as the Emmett Study of 200 feet per minute walking and 1 minute for elevator travel when applicable, the round trip times vary from about 5 to 9 minutes each.

From descriptions of the assumed administrative and operational procedures, the principal departments in Mayo Hospital which will use the non-scheduled materials transport system are as follows:

Department in Mayo Hospital	Items per Day	Trips per Day (stat)	Trips per Day (bulk)
Radiology File Storage	100+	?	1
Central Sterile Process	?	?	1
Central Dispensing	?	?	1
Main Laboratories	508	4	9
Emergency	10-40	10-40	1
Radiology	?	?	?
Business Office (satellite)	20	20	-
Mail Room	50+	-	2

In addition to the above figures, an estimated 200 medical records will be transported by messenger to departmental offices in Mayo Hospital and returned. The number of expected trips on a demand or "stat" basis is not available from the radiology or supply departments.

The numbers of demand or scheduled trips to transport specimens from the clinical to the main laboratories are based on holding specimens for up to one hour before delivery by messenger (and cart) rather than on the continuous basis of an automated transport system.

Location of Mayo Station

To determine the feasibility of extending a pathway from Unit B/C, the station in Mayo Hospital is assumed to be located in one of three locations on Level 2: Room A201 (Copy Center) near the Emergency Department; or Room C103

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

BACKGROUND

Location of Mayo Station
(continued)

(Lab Office), the location assumed by the Emmett Study; or Room D205 (Record Lift), the preferred location to link the existing record lift with the projected transport system.

Other considerations for selecting a pathway include the options to branch from the present horizontal loop above the ceiling of Level 1 in Unit B/C; available clearances between structure, suspended ceiling and mechanical ductwork or piping; the present functions in rooms affected by installation of the pathway; and future access for maintenance.

Performance Criteria

The proposals by vendors to install a non-scheduled materials transport system in Unit B/C generally respond to the following considerations of hardware performance as they relate to aspects of function, procurement, installation, maintenance, and costs:

Function

- 1) Carrier capacity (volume and allowable weight)
- 2) Rate(s) of travel and elapsed travel time between stations
- 3) Acoustic characteristics at stations and pathways
- 4) Infection control in operations and housekeeping
- 5) Protection for laboratory specimens and fluids
- 6) Carrier security for control of drugs and records
- 7) Selective dispatch controls from any station
- 8) Reject mechanisms for miscoded carriers
- 9) Simplicity and safety of operation for using personnel
- 10) Overload and protection devices for system hardware
- 11) Centralized or decentralized monitoring capabilities

Procurement

- 1) Schedule for engineering, fabrication and delivery
- 2) Schedule for installation and testing
- 3) Proprietary features which limit market competition
- 4) List of previous installations and references

Installation

- 1) Riser diagram of pathway system and stations
- 2) Plans indicating compatibility with building systems
- 3) Space requirements and arrangements for stations
- 4) Access panels, fire dampers and other components
- 5) Space requirements and locations for power sources
- 6) Requirements for electrical power and distribution
- 7) Provisions to expand system (pathways, stations, controls)

Maintenance

- 1) Length of time that features have been marketed
- 2) Availability of components and trained service personnel
- 3) Warranty of system and components during useful life
- 4) Reliability of system and expectations for downtime
- 5) Manual alternatives during system malfunctions
- 6) Operating instructions and maintenance schedules

Costs

- 1) Installation costs for Unit B/C and Mayo Hospital
- 2) Cost reductions for stations deleted or shelved
- 3) Annual operating and maintenance costs

UNIT B/C NON-SCHEDULED MATERIALS TRANSPORT SYSTEM

SITE VISITS

Purpose

Site visits have the primary purpose to obtain information about the actual performance of system hardware as experienced by administrative and maintenance personnel at existing installations. Such aspects include details of pathway and station design; operational characteristics of the carriers and coding devices; type of items transported in the system; requirements for capacity and travel rates; schedules for preventative maintenance and training; and system reliability or service experience during the initial and subsequent period of operation.

Selection of Sites

The particular transport systems that are being evaluated for Unit B/C have considerably different records in product development, engineering, marketing, installation and maintenance of domestic projects. The number of installations for the systems range from one to over five hundred.

The selection of example installations from lists furnished by vendors is based on the following assumptions:

1. The inspection of one (semi-operational) installation for each system is necessary to evaluate mechanical and acoustical aspects of the hardware.
2. The configuration and use of the representative system is similar to the projected system in Unit B/C.
3. The site is either in the Midwest or Northeast regions.
4. Aspects of engineering or maintenance are especially pertinent.

Installations

General impressions and evaluations of the transport systems are based on observations and discussions at the following sites:

<u>Installation</u>	<u>City</u>	<u>System</u>
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Trip No. 1 (7-9 April 1976):

Anchor Conveyors	Dearborn, MI	Transflex
Midland Hospital	Midland, MI	Transflex
McMasters Medical Cnt.	Hamilton, Ont.	Telelift

Installations (continued)

Installation	City	System
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Trip No. 2 (19-23 April 1976):

· Rhode Island Hospital	Providence, RI	Horiz/Vert
· Place of Justice	Montreal, Que.	Autopage
· Ada-Bec Systems	Montreal, Que.	Distributor
· Tufts NEMC	Boston, MA	Telegift
· Children's HMC	Boston, MA	Horiz/Vert
· John Hancock Center	Boston, MA	Horiz/Vert

Trip No. 3 (13-14 May 1976):

· Columbus Hospital	Chicago, IL	Horiz/Vert
· LaGuardia (HIP) Hospital	New York, NY	Pathfinder

Findings

The following comments are based on notes from meetings and discussions with administrative and maintenance staff members who are routinely involved with the transport system operation at the various sites:

1. The institutions with existing pneumatic tube systems now tend to discontinue or curtail operation of the systems due to requirements for more capacity and reliability rather than reduced delivery time.
2. The automated materials transport systems are generally used in conjunction with messenger services for "stat" situations and manual carts for bulk handling of supplies, in spite of intentions to include the transport of all items in a single mode.
3. Where administrative guidelines for mandatory use of the transport system are informal or based on departmental "preferences," the system appears to be underutilized.
4. Confidence in the reliability and efficiency of the system depends on the response and success of the maintenance staff to correct malfunctions, particularly during the initial period of operation, and on supervisory staff to adequately and frequently train personnel in the proper use of the system. These factors of maintenance and operation also affect the the utilization of the system.

Findings (continued)

5. In some cases, the system is not used intentionally. For example, at McMasters University Medical Center, laboratory specimens are not transported in the Telelift (Mosler) system to avoid contamination through spillage from the carrier, and x-ray film file jackets are deliberately oversized for the carrier to prevent the dispatch of records from the Radiology Department.
6. Except for the Transflex (Anchor) system installation in open supply and service areas, noise induced from continuous operation of the pathway is generally un-noticed, particularly in areas with acoustic tile ceilings or generally higher levels of background sound. At Tufts New England Medical Center, where the Telelift (Mosler) system pathway passes above the suspended ceiling in some examination rooms, the acoustic conditions are reported as satisfactory. At many installations, the vertical lifts are enclosed by rooms with fire-rated doors and partitions to further isolate noises from the system.
7. Most of the conditions which cause carriers to jamb or to "orbit" in horizontal and vertical pathways of the system or which cause carriers to be sent to a reject station (and result in delays) are attributable to errors in the dispatch and receiving procedures at a station; namely:
 - a) The overloading of a carrier by volume (where the cover bulges or lifts or loads project above the rim and which causes the carrier to jamb in the pathway at points of low clearance) can be avoided by using a rigid cover with positive latch or lock, by not filling the carrier to capacity or by installing a low-clearance bar at the dispatch portal to prevent a carrier from entering the pathway system.
 - b) Incoming carriers are most frequently sent into a recirculating loop or "orbit" in the system when the receiving station is filled to capacity with accumulated carriers. Audio and/or visual signals at the local station and at a central supervisory center are required to monitor the system for this condition.
 - c) Carriers can also be sent into recirculating orbits or directly to a reject station if encoding tabs are improperly set at the time of dispatch. Adequate training of personnel can minimize this situation.

Findings (continued)

- d) In systems that are operated over a 24-hour period, carriers are sometimes dispatched by inquisitive house-keeping staff from stations which are normally closed overnight. The carriers recirculate in orbit until rejected if the code is set for a non-existent station. A keyed lock installed on the dispatch control at each unsupervised station can prevent use of the system by unauthorized personnel.
 - e) The operator may not have time to properly set the encoding tabs or station selector dial before the carrier is injected into the system, when dispatch is automatic after a carrier is placed on the transfer mechanism at a vertical lift. This can be controlled by installing a manual rather than an automatic dispatching switch.
 - f) Time is wasted when several staff members respond to remote annunciator signals which indicate the arrival of a carrier without differentiating between the various departments sharing the station. Separate annunciator signals should be activated by the unique carrier code or be manually controlled by assigned personnel.
 - g) Remote monitoring signals indicating the arrival of a carrier, an overloaded station or a system malfunction often are unnoticed. Response can be improved by combining audio and visual signals and by locating monitoring panels in active areas and in convenient view from adjacent desks or work counters.
8. At the institutions included in the tours, most of the systems are operated from 9 to 16 hours per day and from 5 to 7 days a week. The pathways generally are cleared at the end of each day by diverting all carriers remaining in the system to the reject station for overnight storage and dispatch the following morning.
 9. After initial testing and the first year of operation under the warranty, the maintenance personnel assigned by the Hospital are more familiar and innovative with adjustments of the system than service representatives of the manufacturer. Where maintenance programs are particularly successful, a single mechanic/technician is responsible for continuing operation of the equipment as a "tool" of materials management.

Findings (continued)

10. In the layout and installation of the pathway, it is essential to provide convenient access to power supplies, drive motors, conveyor take-up assemblies and other items which require adjustment, lubrication and/or servicing. It is equally essential that all horizontal pathway intersections and turns, risers or junctions with vertical lifts be accessible to retrieve carriers when jams occur at these locations.
11. A service log generally is maintained with the equipment, including motors, carriers (if motorized), switches or diverting mechanisms and transfer devices along the pathways or at stations. Spare parts including power supplies are stocked within the institution to minimize downtime required to obtain materials. With the Teletlift (Mosler) system, a test center including a workbench with track and power source is required for maintenance programs.
12. Pathways in the Teletlift (Mosler) system are cleaned with a vacuum car after operating hours to avoid acoustic disturbance. In the operation of conveyor systems, debris is deposited on the horizontal surface below the end roller assembly of each conveyor belt.
13. After the first (and atypical) year of operation, the annual costs for maintenance and parts are generally stabilized. For two of the Teletlift (Mosler) systems inspected, the amount budgeted annually for parts ranges from \$5,000 to \$7,000. Most of the institution visited estimate that one man working from half to full time is required to adequately maintain the system.

Number and Cost of Carriers

Tables on a following page indicate the number and approximate distribution of transport carriers that are proposed for each of the systems. Recommendations by vendors are assumed to be based on projected traffic data as outlined in the Summary of Assumptions, revised March 1976, and on the number of stations as noted. Ten of the motorized Telelift carriers are assigned as spares for maintenance, service, peak-load use or reassignment to high-use stations after the system is operational. Spare carriers in the Transflex system are held in reserve (holding) loops while most of the remaining carriers are constantly recirculated within the pathway system, spaced apart at 50-foot intervals.

Also indicated are the approximate unit costs and total inventory value of the carriers. Costs range from \$65 - \$80 each for open tray types with imbedded encoding plates (Diebold and Anchor) which are sufficiently inexpensive and versatile to consider using spares as pre-sorting bins for records or supplies; to \$125 - \$130 each for portable brief-case types with movable-tab encoding devices and hinged covers (Ada-Bec and Sovex-Marshall); to \$950 - \$1000 each for a motor powered vehicle type (Mosler).

Capacity of Carriers

The nominal compartment dimensions, interior volume and rated weight capacities are also listed for each carrier.

In the Pathfinder and Distributor systems, records and files are transported on edge (vertically, as in a briefcase). In the Horizontal/Vertical and Transflex systems, records and files are transported in a stacked or flat condition. In the Telelift system, the compartment (and contents) are rotated during ascent or descent along the pathway and a special gimbal device within the compartment is required to maintain an upright position enroute for lab specimen containers.

A smaller Telelift carrier (Model 850) is also available with nominal compartment dimensions of 18 x 12 x 4 inches and an interior volume of 864 cubic inches. This model is rated for the same weight capacity as the Model 1700 carrier, but it is not proposed for the system in Unit B/C because the required gimbal device is not designed for the smaller compartment.

Evaluation of Carrier Capacity

Figures indicating the actual useable capacity of the carriers for transporting medical records, x-ray films, computer forms and laboratory specimens, are listed in a separate table which follows.

The figures for the Pathfinder carrier are based on a non-stacking prototype with straight sides and ends, and with nominal interior dimensions as noted. Ada-Bec representatives indicate that the new carrier available for the Distributor system is similar in capacity. For either system, an actual carrier is not available for evaluation at this time and it is assumed that the useable volume is not appreciably reduced by hinged covers or latching mechanisms.

Medical Records & Computer Forms

The tests conducted by staff members of University Hospitals indicate that the Pathfinder (and Distributor) carriers can hold an average of 10 medical records, that the Telelift carrier and Diebold tray can hold an average of 20 or more records and that the Transflex container can hold more than 30 average records. Based on information contained in the Summary of Assumptions, not more than 5 non-scheduled medical records are generally requested or dispatched at one time.

Tests also indicate that, when filled to capacity with medical records or computer forms, the rated capacity for the large model Telelift carrier is exceeded by approximately 30%. If operated under this condition, overload devices may disconnect power to the carriers at points of vertical ascent on the pathway to prevent damage to drive motors or on-line switches. This could occur with some frequency if records are accumulated in clinics and normally returned in bulk to file storage, particularly when few carriers are available (Mosler proposes only 2 carriers per station).

The rated capacity of the Pathfinder carrier is exceeded by approximately 35-40% only when fully loaded with computer forms. Over a particular section of powered belt-conveyor or vertical lift, in any of the systems other than Telelift, the load of all carriers enroute over that section is averaged, and an occasional carrier overloaded by weight is not critical to the continuous functioning of the drive mechanism.

X-Ray Film Files

According to the figures listed, the carrier for the Pathfinder (and presumably the Distributor) system is proportioned for the transport of x-ray film files set on edge. The dimensions of a file jacket are approximately 14-1/2 x 17 inches. The interior volume and the rated capacity by weight are correlated, as indicated in the table, so that transport of files in bulk normally will not overload the system.

If the Distributor (Ada-Bec) carrier is supplied with a cover, the files must be placed at an angle or slightly bent within the compartment and the number of files transported per trip will be reduced.

The Telelift carrier will hold an average of only 5 x-ray film files, slightly bent within the compartment during transit. The Diebold carrier can be overloaded with x-ray film files, with files transported in a stacked or flat condition.

Laboratory Specimens

A typical laboratory container for specimens other than blood is assumed to have a maximum cylindrical volume approximately 3 inches in diameter and 6 inches high. The shape will accommodate standard urinalysis and urine culture containers or a cluster of approximately 10 tubes of blood specimens set in a cup-type container in transit.

According to the figures listed, the larger Telelift (Mosler) carrier with gimbal or basket inserts will transport 10 cylindrical container volumes (5 in each basket) at one time. This is equivalent to 10 urinalysis or 60 blood specimen containers.

Assuming 2 stacked trays per carrier, the Pathfinder (Sovex-Marshall) and Distributor (Ada-Bec) system carrier will transport 24 containers at one time. The larger carriers in the Horizontal/Vertical (Diebold) and Transflex (Anchor) systems will transport up to 35 containers.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT

NUMBER AND CAPACITY OF CARRIERS

Manufacturer System	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT	Anchor TRANSFLER
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The figures below indicate the number, cost, type and capacity of carriers and are based on information contained in the proposals for each system or in meeting notes:

Total Number of Carriers	100	96	50	150	788
Number of Stations	20	16	20	19	20
Carriers per Station	5	6	2	7-8	10
Carriers in Pathway	-	-	-	-	400
Spare Carriers	-	-	10	-	188
Unit Cost per Carrier	\$ 125	\$ 130	\$ 950	\$ 65	\$ 80
Total Cost of Carriers	\$12,500	\$12,480	\$47,500	\$9750	\$63,040
Type or Model Number	-	-	No. 1700	Type D	-
Nominal Dimensions (in)	18x6x15h	18x6x14h	18x12x8h	21x16x8h	22x16x10h
Interior Volume (cu. in.)	1620	1512	1728	2688	3520
Rated Capacity (lbs)	20	20	20	40	100
Design Capacity (lbs)	20	20	20	40	30
Aspect of Carrier	vertical	vertical	horiz/vert	horizontal	horizontal

The figures below are derived from tests conducted by staff members of University Hospitals in evaluating the actual useable capacity of the carriers for transporting medical records, x-ray films, computer forms and laboratory specimens

Number of Medical Rcds.	10	-	20	22	33
Weight of Medical Rcds.	14.0 lbs.	-	28.6	30.8	44.0
Number of X-Ray Files	19	-	5	58	75
Weight of X-Ray Files	20.9 lbs.	-	5.5	70.4	106.7
Weight of Computer Forms	27.5 lbs.	-	31.0	34.1	39.6
Number of Lab Containers	24	24	10	35	35

UNIT B/C NON-SCHEDULED MATERIALS TRANSPORT SYSTEM

ESTIMATED TRAVEL TIME BETWEEN STATIONS

Travel Time Functions

The tables on following pages indicate the estimated elapsed time for carrier travel between selected stations. This elapsed time is a function of the horizontal and vertical rates of travel, the length of intermediate pathways, the direction of travel, and the number of cross-over switches installed to avoid major loops in the system.

The figures for each system are based on data furnished by vendors with the initial proposals. A time matrix is not available for the Pathfinder (Scovex-Marshall) system and the proposal for the Distributor (Ada-Bec) system does not contain a complete matrix.

Transport of Medical Records

The average elapsed time for carrier travel, in transporting non-scheduled medical records from Station 8 (Medical Records file processing and storage functions) to the outpatient clinics in Unit B/C, will be approximately 3 minutes with the Distributor and Telelift systems to 5 or 6 minutes with the Horizontal/Vertical or Transflex system.

These figures can be compared to calculations in the Emmett Study where the average elapsed travel time from Medical Records to the outpatient clinics is estimated to be 2 minutes by walking and 2 to 3 minutes by automated carrier.

In responding to requests from Inpatient Admissions or the satellite Business Office, it will require an average of 5 to 7 minutes to transport records by carrier from Station 8 (Medical Records) to Station 20 (Mayo Hospital) with the Distributor or Telelift system and 9 or 13 minutes with the Horizontal/Vertical or Transflex system.

As indicated in the Summary of Assumptions, revised March 1976, the estimated round trip travel time between Station 8 and Station 20 at Level 2 is approximately 5 - 6 minutes for messenger service.

Transport of Pharmaceuticals

The average elapsed time for carrier travel, in transporting unit dose drugs or injections from Outpatient Pharmacy to clinics in Unit B/C, will be approximately 4 to 6 minutes with the Distributor, Telelift and Horizontal/Vertical systems or 9 minutes with the Transflex system.

These figures can be compared to calculations in the Emmett Study where the average elapsed travel time from Outpatient Pharmacy to the clinics is estimated to be 2 minutes by walking and 4 to 5 minutes by automated carrier.

Transport of Lab Specimens

It is assumed that most of the specimens from ambulatory patients will be collected at the Clinical Laboratory. The specimens will be transported to the main laboratories in Mayo Hospital (if not processed at the satellite facility) and the results will be sent directly to the clinics where patients have returned to wait. The processing time will vary according to the type of test(s), available technicians, workload and capacity of equipment. However, from data furnished by the vendors, the approximate time required for transport of both specimen and lab report can be established:

The average elapsed time for carrier travel, in transporting specimens from Station 1 (Clinical Laboratory) to Station 20 (Mayo Hospital), will be approximately 4 or 5 minutes with the Distributor and Telelift systems to 8 or 9 minutes with the Horizontal/Vertical and Transflex systems.

These figures can be compared to calculations in the Emmett Study where the average elapsed travel time from the Clinical Laboratory to Room C203 near the main laboratories in Mayo Hospital is estimated to be 3 to 4 minutes by walking and 4 to 5 minutes by automated carrier.

The figures below indicate the combined round-trip travel time and the minimum assumed loading and unloading time in minutes for one carrier-cycle in the Distributor (Ada-Bec) and Telelift (Mosler) systems from Clinical Laboratories in Unit B/C to Mayo Hospital and return:

	Ada-Bec DISTRIBUTOR	Mosler TELELIFT
Station 1 to Station 20	3.5	4.7
Station 20 to Station 1	3.0	7.2
Total round trip (minutes)	6.5	11.9
Load/unload time	5.0	5.0
Total cycle time (minutes)	11.5	16.9
Number of cycles per hour	5.2	3.5
Number of cycles per day	47	32

UNIT B/C NON-SCHEDULED MATERIALS TRANSPORT SYSTEM

ESTIMATED TRAVEL TIME BETWEEN STATIONS

Transport of Lab Reports

The average elapsed time for carrier travel, in transporting laboratory reports from Station 20 (Mayo Hospital) to the clinics in Unit B/C, will be approximately 5 or 7 minutes with the Distributor and Telelift systems to 14 or 17 with the Horizontal/Vertical and Transflex systems.

These figures can be compared to calculations in the Emmett Study where the average elapsed travel time from Room C203 (near the main laboratories in Mayo Hospital) to the clinics in Unit B/C is estimated to be 3 to 4 minutes by walking and 7 to 8 minutes by automated carrier.

Waiting Interval for Lab Results

The following figures indicate the minimum and maximum total elapsed time required for transporting specimens from the Clinical Laboratory to the main laboratories and sending reports to clinics in Unit B/C, not including processing or holding time:

Distributor (Ada-Bec)	8 to 10 (average 9) minutes
Telelift (Mosler)	10 to 13 (average 12) minutes
Horizontal/Vertical (Diebold)	17 to 24 (average 22) minutes
Transflex (Anchor)	20 to 35 (average 26) minutes

Transport of X-Ray Files and Medical Supplies

The elapsed time required to transport laboratory reports from a central and shared station on Level 2 in Mayo Hospital to the outpatient clinics in Unit B/C will be approximately the same as the time required to transport X-ray film files or medical supplies from a second and proximate station located on Level 1 to the same clinics.

Summary

As first shown by calculations in the Emmett Study, non-scheduled items are more rapidly transported by messenger service than by mechanical systems of the type proposed for installation in Unit B/C. The assumptions contained in the study, regarding the probable elapsed time required for carrier travel between stations, correlate with the time matrix furnished by Mosler in the proposal for the Telelift system.

In general, the figures indicate that with the Distributor (and presumably the Pathfinder) system, the elapsed time for carrier travel between stations will be less than with the Telelift system. The figures also indicate that elapsed travel times with the Telelift system are doubled with the Horizontal/Vertical and Transflex systems, particularly in transporting medical records to the clinics and in transactions between Unit B/C and Mayo Hospital.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

ESTIMATED TRAVEL TIME BETWEEN STATIONS

Manufacturer System	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT	Anchor TRANSFLEX
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The figures below indicate the estimated elapsed time in minutes for carrier travel between Station 8 (Medical Records) and the clinics in Unit B/C including Station 3 (Word Processing and Medical Information Center) and Station 20 (Mayo Hospital):

4 Orthopedics/PM&R/EKG	2.0		2.2	5.8	5.9
5 Obstetrics/GYN			0.9	.4	4.9
6 Surgery/Urology/Derm			3.0	5.0	6.9
7 Ambulatory Surg/Procto			3.6	4.0	8.0
12 Medicine	2.0		2.3	5.6	5.9
13 Family Practice/Neuro	4.5		2.4	5.4	6.9
14 Pediatrics	4.0		2.6	5.2	6.6
15 Shell			2.7	5.0	6.4
16 Shell			2.9	4.8	6.2
17 Shell			3.0	4.6	6.0
18 ENT/Audiology/Psych			3.2	4.4	5.9
19 Ophthalmology	<u>3.2</u>		<u>3.3</u>	<u>4.2</u>	<u>5.6</u>
Average	3.1		2.7	4.9	6.3
3 Word Proc. Center			4.2	4.7	4.3
20 Mayo Hospital			6.7	9.0	12.7

The figures below indicate the estimated elapsed time in minutes for carrier travel between Station 11 (Pharmacy) and the clinics in Unit B/C:

4 Orthopedics/PM&R/EKG			4.8	4.9	8.8
5 Obstetrics/GYN			3.5	7.0	7.8
6 Surgery/Urology/Derm			5.5	4.2	9.9
7 Ambulatory Surg/Procto			6.1	3.0	11.0
12 Medicine			4.9	4.7	8.5
13 Family Practice/Neuro	4.2		4.9	4.5	9.6
14 Pediatrics	4.0		5.1	4.3	9.3
15 Shell			5.2	4.1	9.1
16 Shell			5.4	3.9	8.9
17 Shell			5.5	3.7	8.7
18 ENT/Audiology/Psych			5.7	3.5	8.6
19 Ophthalmology	<u>3.2</u>		<u>5.8</u>	<u>3.3</u>	<u>8.3</u>
Average	3.8		5.65	4.2	9.0

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

ESTIMATED TRAVEL TIME BETWEEN STATIONS

Manufacturer
System

Sovex-Marshall
PATHFINDER

Ada Bec
DISTRIBUTOR

Mosler
TELELIFT

Diebold
HORIZ/VERT

Anchor
TRANSFLEX

The figures below indicate the estimated elapsed time in minutes for carrier travel between clinics in Unit B/C to Station 1 (Clinical Laboratory) for the transport of specimens collected in the clinics:

4 Orthopedics (PM &R/EKG		1.3	5.0	4.1
5 Obstetrics/GYN		2.4	3.4	5.0
6 Surgery/Urology/Derm		2.7	5.6	10.9
7 Ambulatory Surg/Procto	2.5	2.1	5.7	11.9
12 Medicine		1.4	4.8	4.1
13 Family Practice/Neuro		5.8	4.6	6.0
14 Pediatrics		5.6	4.4	5.8
15 Shell		5.5	4.2	5.5
16 Shell		5.3	4.0	5.3
17 Shell		5.2	3.8	5.1
18 ENT/Audiology/Psych		5.0	3.6	
19 Ophthalmology	3.5	4.9	3.4	
Average	3.0	3.9	4.4	6.4

The figures below indicate the estimated elapsed time in minutes for carrier travel between Station 1 (Clinical Laboratory) in Unit B/C and Station 20 (Main Labs) in Mayo Hospital for the transport of specimens not processed in the satellite facility:

3.5	4.7	8.3	9.3
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The figures below indicate the estimated elapsed time in minutes between Station 20 (Main Labs) in Mayo Hospital to clinics in Unit B/C for the transport of laboratory results:

4 Orthopedics /PM&R/EKG	4.5	6.7	15.6	10.3
5 Obstetrics /GYN	5.0	5.4	12.4	14.3
6 Surgery/Urology/Derm	6.0	7.4	9.5	22.4
7 Ambulatory Surg/Procto	6.5	8.1	8.4	25.5
12 Medicine	4.5	6.8	15.4	10.3
13 Family Practice/Neuro	6.7	6.9	15.2	
14 Pediatrics		7.0	15.0	
15 Shell		7.2	14.8	
16 Shell		7.3	14.6	
17 Shell		7.5	14.4	
18 ENT/Audiology/Psych	5.7	7.6	14.2	
19 Ophthalmology	5.5	7.8	14.0	
Average	5.5	7.1	13.6	16.6

Rate of Travel

In addition to the number of cross-over switches installed to avoid major loops in the pathway system, the elapsed time for carrier travel between stations is a function of the horizontal and vertical rates of travel, the length of intermediate pathway and direction of travel.

The rates of travel for each of the systems are tabulated on a page which follows. In the systems using light belt-conveyors (Pathfinder and Distributor), the horizontal rate of travel is more than 3 times the vertical rate(s) of the lift components. In the other systems, the rate of travel for the horizontal is the same as for the vertical components.

If the high rate of travel for horizontal conveyors is reduced during operation of the Pathfinder or Distributor system (to prolong component life or conserve energy), the elapsed time of carrier travel between stations as indicated in a previous section will increase proportionately.

Station Capacity

Another factor in determining the elapsed time for carrier travel, from dispatch to arrival, is the capacity of a typical station to receive incoming carriers. A table on a following page indicates for each of the systems the number of carriers that can accumulate at typical stations before subsequent carriers are sent into recirculating orbit(s) or loop(s). Extra carriers need to be returned to home or reserve stations to keep the local station open.

When several carriers are scheduled for dispatch to a single station in rapid succession, as with a procedure discussed in a subsequent section to transport medical records in bulk, personnel at the receiving station must be prepared to remove incoming carriers at once or the station capacity must be increased to accommodate the "surge" condition.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

PATHWAY AND STATION CAPACITY

Manufacturer System	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT	Anchor TRANSFLE
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The figures below indicate the rates of travel in feet per minute on horizontal and vertical components of system pathways:

Horizontal Rate of Travel	200	200	100	75	70
Vertical Rate of Travel	60	60	100	75	70

The figures below indicate the handling capacity of pathway components expressed as the number of carriers per minute:

Horizontal Path Capacity	10	-	-	8	14
Vertical Path Capacity	10	-	-	8	8
Branch Lift Capacity	2	-	-	4	-

The figures below indicate the distance in feet that carriers are automatically spaced apart during travel on horizontal pathways:

Spacing of Carriers	-	10	-	-	5
---------------------	---	----	---	---	---

The figures below indicate the number of carriers that can accumulate at typical stations before subsequent carriers are sent into a recirculating loop:

Station Capacity (Flrs 1-2)	3	3	2	3	3
Magazine Capacity	$\frac{1}{4}$	$\frac{3}{6}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{4}$
Total per Station					
Station Capacity (Flrs 3-9)	3	2	2	3	3
Magazine Capacity	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{4}$
Total per Station					

The figures below indicate the approximate length of pathways in linear feet for each of the systems including main line, recirculation or storage loops, spurs to stations and shafts:

Horizontal Pathway	1760	2400	2050	1850	3500
Vertical Pathway	<u>300</u>	<u>320</u>	<u>330</u>	<u>300</u>	<u>400</u>
Total Pathway	2060	2720	2380	2150	3900

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

CAPACITY OF SYSTEM FOR BULK DELIVERY

Bulk Delivery of Records

The factors which need to be established, if it is anticipated that the system may be used to transport some bulk or scheduled items, such as medical records, include an estimate of the volume to be transported at one time, the capacity of carriers, the number of carriers available and the capacity of stations to receive carriers in rapid succession (which is discussed in a previous section).

Carriers Required/
Station Capacity

As an example, the table below indicates the number and capacity of carriers that are required at the beginning of a clinic day to transport the scheduled charts in bulk from medical record storage to each of the clinic stations in Unit B/C. If the present arrangement for retrieving, processing and holding medical records is continued and all scheduled records are dispatched at one time, an overload condition is shown at most of the receiving stations if the Pathfinder, Distributor, or the small Telelift system carrier is used (which hold up to 10 records), and if personnel are not available at the time of delivery to remove incoming carriers. Also, more carriers are required than are proposed to be assigned at several of the stations or included in the entire Telelift system.

If a larger carrier is used (such as the Diebold type which holds 20 or more records by weight and volume), the receiving capacity at typical stations is exceeded in several clinics only during peak conditions.

Information in the following table is derived from data compiled by the Medical Record department over a 6-month period:

Station	No. of Scheduled Medical Records/Day		No. Carriers Req'd. for Bulk Delivery	
	Average	Peak	10/carrier	20/carrier
4 Orthopedic/PM&R/EKG/Neuro	28	36	3- 4	2-2
5 Obstetrics/GYN	61	100	6-10	3-5
6 Surgery/Urology /Derm*	-	-		
7 Ambulatory Surgery/Proct	53	90	5- 9	3-5
12 Medicine	86	99	9-10	4-5
13 Family Practice/Neurology	26	26	3	2
14 Pediatrics	97	129	10-13	5-6
15 Shell	54	77	5- 8	3-4
16 Shell	11	10	1	1
17 Shell	10	12	1	1
18 ENT/Audiology/Psych	45	67	5- 7	3-4
19 Ophthalmology	86	86	9	5
Total Number of Carriers Required			56-75	30-40

* combined with Station 7, Ambulatory Surgery

Specimen Transport Study

The figures below are the daily average number of specimens processed per hour through the present Out-patient (Clinical) Laboratories, according to a study discussed in a Hospital memorandum dated 25 Nov. 1975:*

	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30
	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30
Blood specimens to be tested at OPD Laboratory	23	17	21	13	14	15	10	12	12
Blood specimens to be tested at Chemistry Lab	146	31	42	32	15	18	17	19	82
Urine (24-hour) specimens sent to Chemistry Lab	8	3	2	2	2	1	1	0	0
Routine urinalysis specimens sent to Chemistry Lab	19	9	10	7	7	9	10	10	6
Total number of specimens received at OPD Laboratory (645 specimens per day)	196	60	75	54	38	43	38	41	100
Total number of specimens dispatched from OPD Lab (508 specimens per day)	173	43	54	41	24	28	28	29	88

Capacity of System

Based on figures listed in previous sections which discuss the number and capacity of carriers (page 3.3) and the estimated travel time between stations (page 3.6), the performance of the systems to transport laboratory specimens can be compared as follows:

With the Distributor (Ada-Bec) system, a round trip cycle between the Clinical Laboratory and Mayo Hospital will be approximately 12 minutes, which provides 5 cycles per hour. A single carrier loaded with 24 containers can transport 120 specimens per hour. Using all 6 carriers assigned to the station, one carrier can be dispatched every 2 minutes.

* From Nancy Kay Omundson (University Hospitals) to John Scott (TAC).

Capacity of System (cont)

With the Telelift (Mosler) system, an equivalent round trip cycle will be approximately 17 minutes, which provides only 3 cycles per hour. A single carrier loaded with 10 containers can transport approximately 50 specimens per hour. Two carriers are assigned to a typical station. However, to transport the peak loads that are listed in the survey, a minimum of 4 carriers will be required during the first hour of a day. Then one carrier can be dispatched at 4 rather than 8 minute intervals.

Pathway Location

The horizontal pathway at Level 1 passes above the ceiling and over functional spaces in which acoustic isolation from system-induced noise is of primary importance to medical and administrative staff members. To indicate the location of such spaces relative to the transport system pathway, a tone is applied to the composite pathway and floor plan of Level 1 which follows. Included within the toned area are examination, consultation, dictation, treatment and office spaces. Not included are waiting and reception spaces; utility and toilet rooms; radiographic and special procedure rooms; and general administrative and circulation spaces.

Sources of Noise

Technical data is generally not available to adequately describe the acoustic characteristics of system operation. Based on field trip experience, it is evident that sounds which are potentially disturbing are emitted from intermittent switching, diverting or transfer operations (all systems); from motorized carriers, particularly when ascending or descending on the pathway or at stations (Tel lift); from impact noises of carrier against carrier at stations (all systems); from carriers on roller sections of pathway (Horizontal/Vertical and Transflex); from sprocket contact with chain or dog linkages on the horizontal pathway (Transflex); and from sprocket contact with linkages at the base of continuous vertical lifts (all conveyor and lift systems). The chain-driven Transflex system installation is considered to have the highest noise level of all systems inspected.

Acoustic Control

It is evident from the floor plan which follows that the projected pathway does not pass above all acoustically sensitive spaces. This condition is limited to approximately 15 locations in the nearly 100 spaces identified.

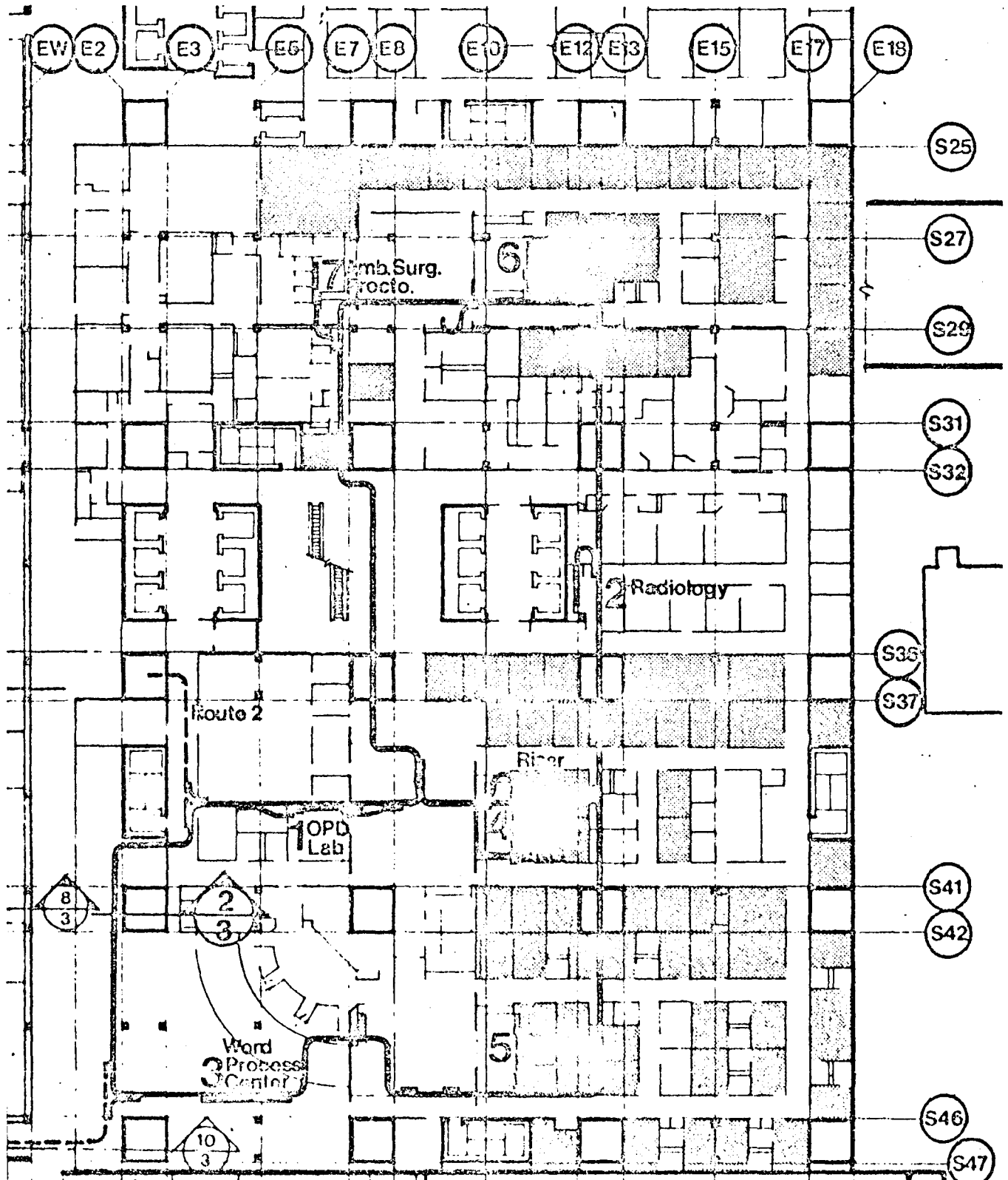
The following precautionary measures are available to control system-induced noise and ensure a satisfactory acoustic environment in the affected spaces:

1. The suspended acoustic-tile ceiling in combination with an ambient background sound from the air conditioning system will attenuate most or all of the noise attributable to segments of the general horizontal pathway.
2. Vertical lifts or shafts with transfer devices are enclosed with 1 or 2 hour rated construction.

Acoustic Control

3. Drive motors, switches, or diverting mechanisms can be located above corridors or other non-sensitive spaces where possible to provide access for maintenance and reduce the potential for acoustic disturbance
4. Vibrating mechanisms can be installed with isolation devices at points of support.
5. System components are proposed which generally do not include live or free rollers along the pathway.
6. Remedial acoustic insulation can be applied if required after system is operational.

The reserved pathway of the transport system is shown below, projected on the floor plan of Level 1 in Unit B/C. The toned areas indicate spaces assigned to examination, consultation or administrative functions which require maximum acoustic isolation from noise attributed to carriers, drive motors, switches, or other devices along the pathway.



Strata Assigned to Pathway

The floor-to-floor height between Levels 1 and 2 in Unit B/C is 14'-0" and a typical floor-to-ceiling height of 9'-0" is provided throughout most of Level 1. Above the suspended ceiling at this level, the horizontal pathway for the automated materials distribution system is integrated with structural, mechanical and electrical elements.

The horizontal pathway passes beneath most rolled steel framing members, between and through the long-span steel trusses and between primary risers in the HVAC and plumbing systems. Segments of the pathway that are oriented east and west are centered on the space between diagonal members of the trusses to provide maximum vertical clearances for moving carriers, as indicated in the diagrammatic sections that follow.

The carrier and pathway assemblies for each of the proposed systems, with the exception of Transflex, are proportioned to pass between the fireproofed diagonals or trusses. To accommodate the Transflex pathway, the ceiling must be lowered from 9'-0" to 8'-0" throughout most of Level 1.

The return loop segment of a continuous belt in the Distributor (Ada-Bec) system usually is installed in the same horizontal plane and directly beside the first loop segment to form a dual (two-way) pathway. By contrast, in the Pathfinder (Sovex-Marshall) system, two independent and continuous belts are used to provide a dual pathway. To pass between the diagonals or the trusses, the pathway segments of the Distributor system must be separated as shown.

The general elevation for the bottom of the pathway is set on top of the lower chord of the trusses, approximately 2'-2" above the finished ceiling, or 11'-2" above the finish floor, including allowances for sprayed fireproofing. Slight vertical rises and falls in the pathway are required at intersections with deep framing members or ductwork to maintain proper clearances.

Access to Pathway

The ceiling system throughout most of Level 1 consists of movable acoustic and service panels which provide almost full access to the pathway. Access is less convenient above the plaster ceiling in the elevator and escalator lobbies and over some examination rooms.

For all the transport systems considered, convenient access to the pathway is required either to adjust photoelectric beams or magnetic sensors; maintain motor drives or switches; replace belts, rollers or traction parts and retrieve carriers after system malfunction. It is an advantage therefore to install the pathway immediately above the suspended ceiling and lighting stratas (and below ductwork and piping).

In Unit B/C, the pathway is necessarily assigned to a higher strata for coordination with structure and other building systems, and some mechanical services will be unavoidably installed below the pathway. The configuration of a higher and partially inaccessible pathway must be simple to minimize the number of conditions (such as turns, bends, switches and transfer mechanisms) which cause carriers to jamb enroute.

Comparison of Pathways

On a following page, pathways of the 4 systems which combine horizontal conveyors and vertical lifts are compared to the continuous-track pathway of the Teletift system in the ceiling above Level 1. As shown, the Pathfinder system layout most nearly coincides with the pathway configuration that is provided in the contract drawings.

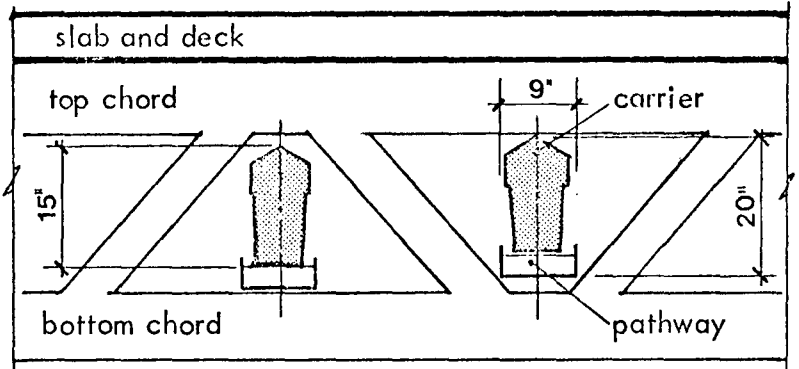
In the layout for the Horizontal/Vertical (Diebold) system, the pathway is simplified to a single loop with two-way spurs to remote stations. In part, this is achieved by a vertical realignment of several stations on Levels 1 and 2 (and above), which requires redesign of the reception areas.

A dual pathway arrangement is used in the Distributor (Ada-Bec) system layout. It generally coincides with most of the Teletift pathway to minimize additional coordination and redesign. Other advantages include the consolidation of two-way conveyors along a principal right-of-way to simplify the number of access points required for maintenance, and the deletion of pathways above the plaster ceiling in the escalator lobby to avoid deep beams and problems with access.

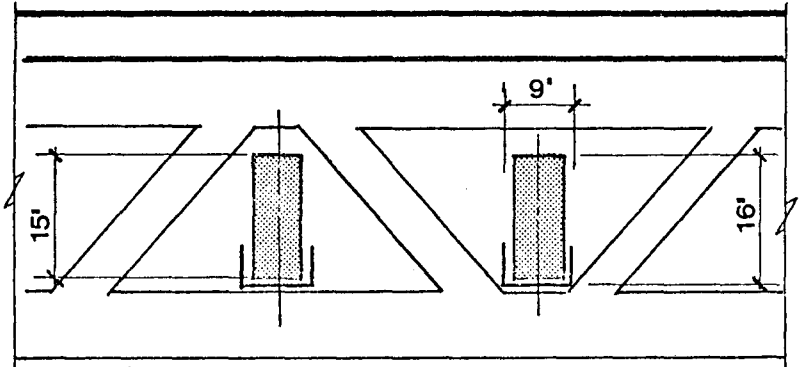
The alternative pathway for the Transflex system is shown with storage loops in 3 areas, which hold most of the 188 spare carriers. The storage loops are to be used as "dispensers" of empty carriers or as "parking lots" of bulk-loaded carriers to be dispatched on a following day. The pathway strata is relocated below the bottom chords of trusses which requires a lower ceiling height throughout most of Level 1.

The sections below at scale 1/2" = 1'-0" indicate the profile and dimensions of system pathways as they pass through the framing members of long-span trusses:

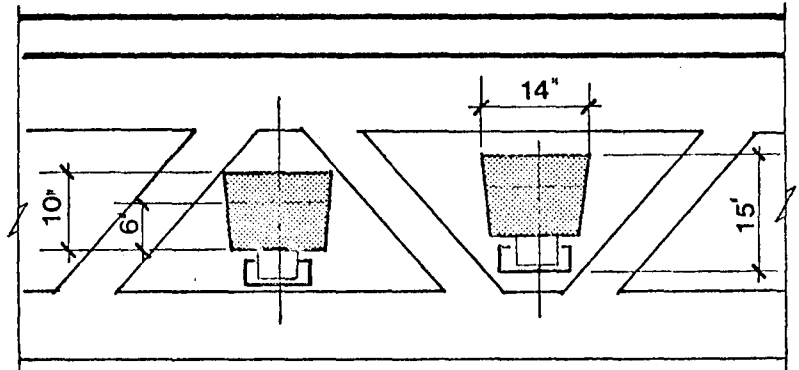
Sovex-Marshall
Pathfinder System



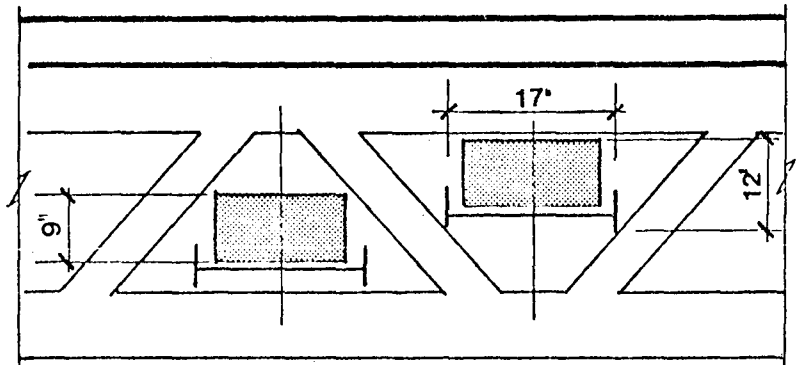
Ada-Bec
Distributor System



Mosler
Telelift System



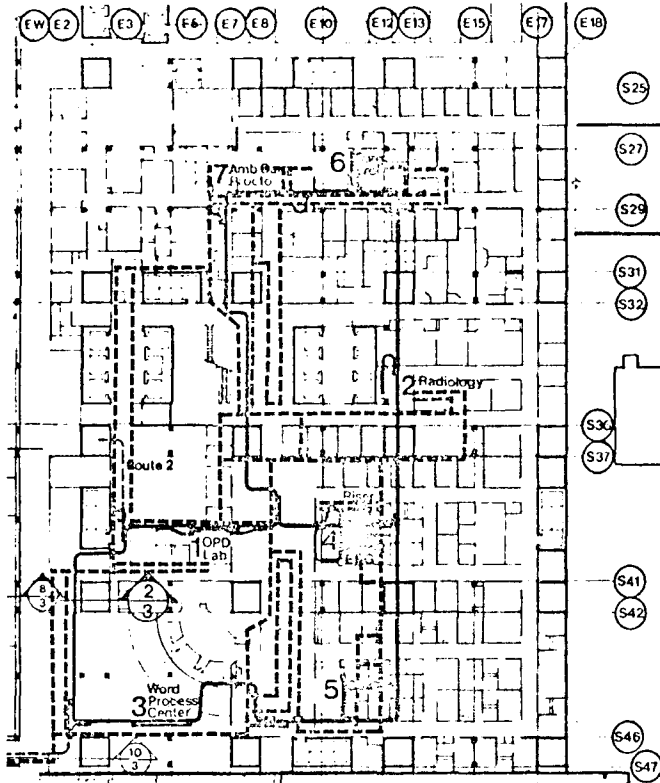
Diebold
Horizontal/Vertical System



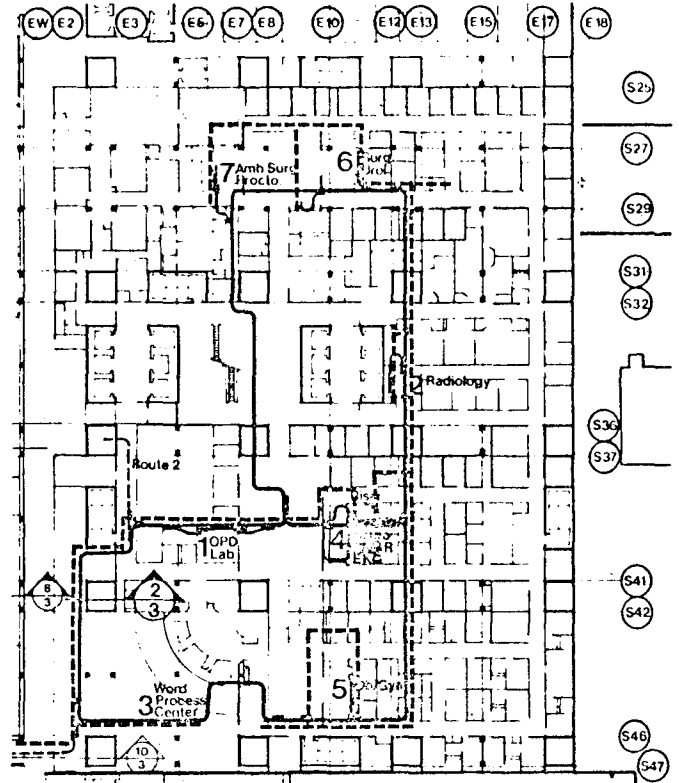
UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

CLEARANCES FOR PATHWAY IN CEILING STRATA

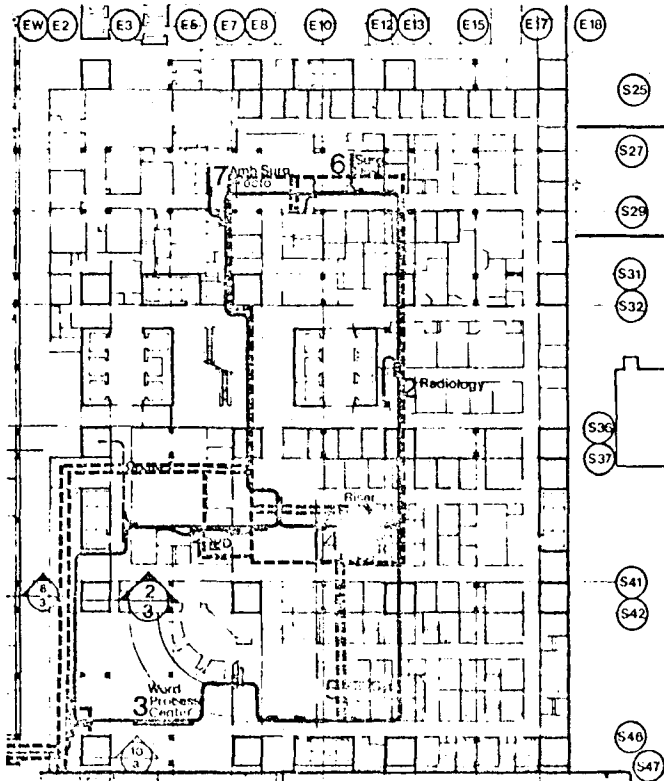
The plans below compare the proposed pathway layout above the ceiling of Level 1 for each system (dashed lines) with the present pathway based on the Telelift system (solid line):



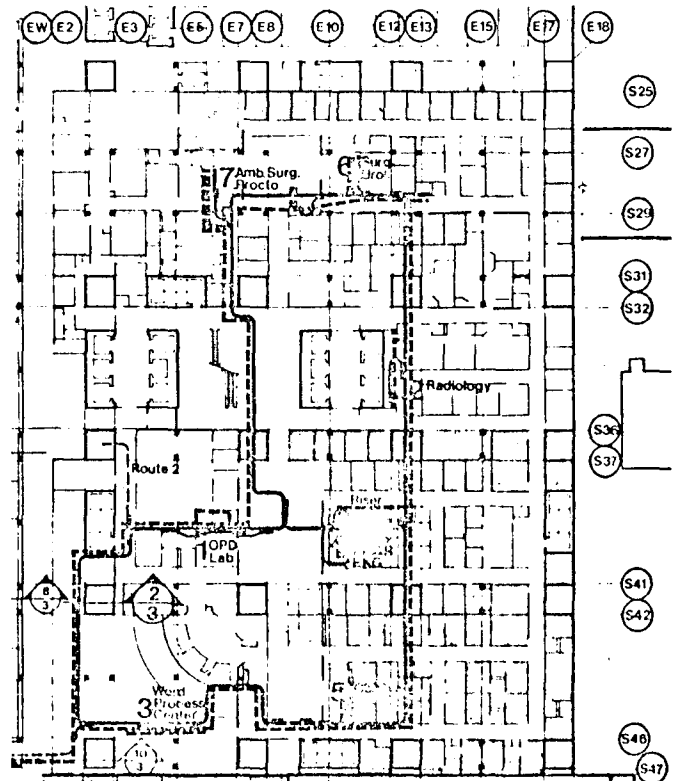
Transflex System (Anchor)



Distributor System (Ada-Bec)



Horizontal/Vertical System (Diebold)



Pathfinder System (Sovex-Marshall)

Alternate Pathway Strata

The alternative pathway configuration for the Transflex system is based on reducing the height of the suspended ceiling from 9'-0" to 8'-0" throughout most of Level 1, to locate the pathway strata below the bottom chord of trusses. This proposed modification has the following implications:

1. On a floor plan of Level 1 which follows, a tone is applied over rooms in which a ceiling height of 9'-0" (or more) must be maintained:

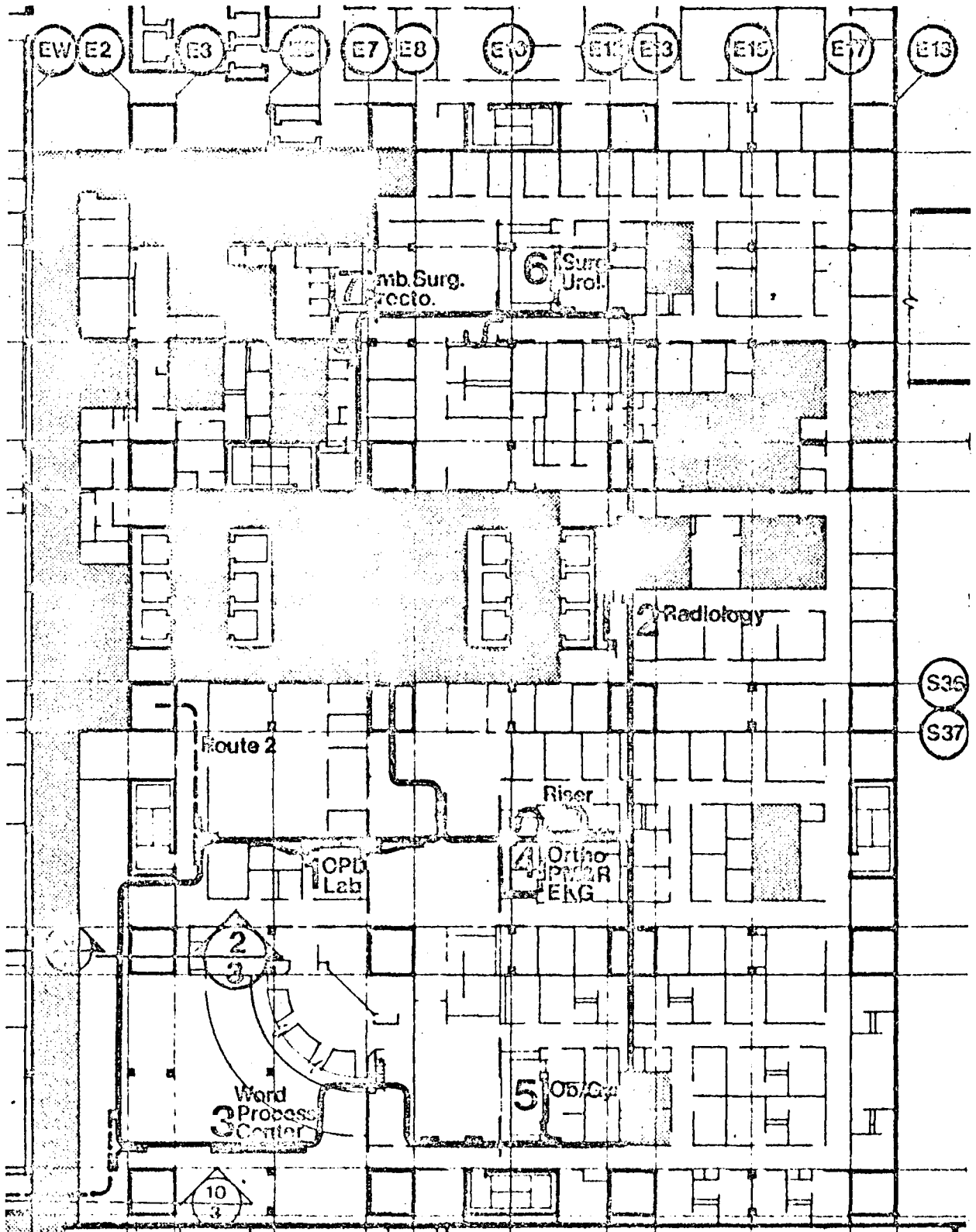
Room	Description	Room	Description
1-292	Minor Operating	1-333	Treatment
1-297	Minor Operating	1-334	Treatment
1-283	Minor Operating	1-130	Treatment
1-296	PAR	1-131	Treatment
1-306	Treatment		
1-307	Isolation Treatment	1-235	Radiographic
1-299	Anesthesia Work	1-232	Radiographic
1-295	Storage	1-240	Radiographic
1-276	Procto Exam	1-242	Radiographic
1-277	Procto Exam	1-243	Radiographic
1-176	Cast Room	1-318	Urology
		1-319	Treatment

2. In addition, the ceiling in the public elevator and escalator lobbies and in the main service corridor should be maintained at 9'-0".
3. Other aspects which affect the contract documents include a substantial reduction of wall area and painting; an increase in the amount of lead sheet acoustical barriers above the ceiling; a reduction in the height of hollow metal door frames and panels, including access doors to the service shafts; an increase in the length of vertical piping at sprinkler heads; and a reduction of the mounting height for wall clocks and nurse call signals.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

REDUCTION OF CEILING HEIGHT TO 8'-0" (LEVEL 1)

The reserved pathway of the transport system is shown below, projected on the floor plan of Level 1 in Unit B/C. The toned areas indicate spaces in which a ceiling height of 9'-0" (or more) must be maintained:



Budget Estimates

The budget estimates contained in the proposals by vendors provide for furnishing, installing and testing of equipment for horizontal and vertical pathways, stations, controls and carriers. The unadjusted figures from each proposal are tabulated on a page which follows. The estimated costs for the pathway and remote station in Mayo Hospital are separated from costs of the primary system in Unit B/C.

The proposal for the Transflex (Anchor) system installation provides for complete bulk distribution of scheduled and non-scheduled items and includes additional carriers and storage loops. It presumes future extensions to Unit K/E, Unit J and other buildings of the Health Sciences complex. From informal discussions with representatives, it is apparent that the scope of the system may be reduced approximately 40 percent to meet only the requirements for demand delivery. However, these reduced installation costs amount to more than twice the estimated cost of the Diebold system.

Cost per Station

The economic analysis contained in the Emmett Study is based on a cost per station of \$26,300 for 14 stations in Unit B/C and \$64,600 for the pathway and station in Mayo Hospital. This data is derived from budget estimates prepared by Mosler for the Telelift system. The comparable cost per station for the Distributor (Ada-Bec) system is listed at \$13,800.

Figures in the table which follows indicate the cost per station (based on the current budget estimates) for each of the systems evaluated in this summary. Based on the system in Unit B/C only, the figures range from approximately \$21,200 to \$31,600, with the average cost per station for the Telelift system listed at approximately \$25,300.

Range of Estimates

Total budget estimates for systems other than Transflex (Anchor) range from \$462,500 for the Pathfinder (Sovex-Marshall) system to \$730,000 for the Horizontal/Vertical (Diebold) system, a separation of approximately 37 percent. Estimates of \$490,000 for the Distributor (Ada-Bec) and \$546,382 for the Telelift (Mosler) system are approximately 6 percent and 15 percent higher, respectively, than the estimate for the Pathfinder (Sovex-Marshall) system.

Cost Reduction for Shell Stations

The proposal from Ada-Bec is based on a system of 16 active stations in Unit B/C and 1 station in Mayo Hospital. Stations in shell space on Levels 5 through 7 are excluded. Based on information subsequently furnished from vendors of the other systems, in deleting all switches, transfer mechanisms, controls, station fronts and run-outs at the 3 stations on the vertical pathway, the estimates can be reduced by the following amounts:

Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
\$15,000	-	\$15,450	\$11,500

Maintenance and Spare Parts

Only the budget estimate from Diebold includes spare parts. A value of \$4,500 can be deducted from the total amount to adjust the estimate for comparison with other systems.

All proposals include a warranty on materials and equipment for one year. Defective parts will be replaced without charge during the warranty period.

Additional Fire Dampers

Generally, fire dampers in slab or shaft openings at stations on Levels 2 through 9 are included in the budget estimates for all of the systems except Telegift. Additional fire dampers along the pathway at rated walls or mechanical shafts are not included. The proposal from Mosler excludes all fire dampers. Assuming an installation cost of \$650 at single pathway locations and \$750 at double pathway locations, the budget estimates may be increased by the following amounts to include all dampers:

Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
\$8,200	\$7,500	<u>\$18,750</u>	\$6,900

Belt Replacement

Estimated costs for labor and materials to replace the fabric belts on horizontal conveyor pathways are not included in the proposals. Based on information from site visits and meetings with vendors, it is expected that belts in the Pathfinder (Sovex-Marshall) and Distributor (Ada-Bec) system will be replaced after 5 years of operation and that original belts in the Horizontal/Vertical (Diebold) system may continue in use through a projected 20-year system life. Assuming figures for labor and materials as listed below, the estimated costs to replace belts during a 20 year period are as follows:

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF BUDGET ESTIMATES

	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
Pathway (linear feet)	1760	2400	-	-
Length of Belt (linear feet)	x 2 = 3520	x 1.5 = 3600		
Cost of Belt (\$2 per foot)	\$7,040	\$7,200		
Labor (40 hours x \$20)	800	800		
Total Replacement Cost	<u>\$7,840</u>	<u>\$8,000</u>		
Total (4 times in 20 years)	\$31,360	\$32,000		?

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF BUDGET ESTIMATES

Manufacturer System	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT	Anchor TRANSFLE
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The figures below are based on budget estimates contained in the proposal for each system and include station, pathway, control, and carrier equipment, installed and tested:

System in Unit B/C	\$402,500	\$425,000	\$480,291	\$600,000	\$2,702,50
System in Mayo	60,000	65,000	66,091	130,000	447,50
Total Estimate	<u>\$462,500</u>	<u>\$490,000</u>	<u>\$546,382</u>	<u>\$730,000</u>	<u>\$3,150,00</u>

The figures below indicate the proposed cost reductions for omitting stations in Unit B/C (according to recommendations contained in the Emmitt Report summary):

Station 2 Radiology	\$16,000	\$20,000	\$ 8,902	\$ 26,000	-
Station 6 Surgery/Urology	\$16,000	\$15,000	\$ 3,674	\$ 36,000	\$ 130,10
Station 9 Admissions	\$16,000	-	\$ 9,180	\$ 27,000	\$ 129,50
Station 10 Business Office	\$16,000	\$19,000	\$ 3,063	\$ 36,000	-

The budget estimates, according to the proposals for each system, are based on the following number of active stations:

Stations in Unit B/C	19	16	19	19	19
Stations in Mayo	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
Total Stations	20	17	20	20	20

Based on the budget estimates for the installation in Unit B/C, the average cost per station for each system is as follows:

Cost per Station	\$ 21,184	\$ 26,562	<u>\$ 25,278</u>	\$ 31,578	\$ 142,23
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UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF CHANGE ORDER COST ESTIMATES

Related Work By Owner

The budget estimates contained in the proposals by vendors are based on the amount of labor and materials required to furnish and install items of system hardware, controls and carriers. The composite lists of items which follow are assumed by vendors to be separately contracted as work and expense by the owner related to the installation and operation of the system:

Building Systems

The following items are related to elements of building systems in Unit B/C and Mayo Hospital:

Cost 2

1. Provide and protect the right-of-way (pathway) space necessary to ensure the satisfactory clearances and conditions to install and operate the system.
2. Provide excavation, foundations, masonry and concrete of any kind.
3. Provide necessary structural framing and alterations to building, machinery and equipment.
4. Provide and install forms, sleeves and reinforcement for required slab and wall penetrations.
5. Provide and install enclosure, necessary fire-protection and architectural finishes at stations and other installed equipment related to system.
6. Provide cutting, patching and painting of equipment other than factory finish.
7. Provide and install wall or ceiling access door and/or panels as required to gain access to equipment for maintenance and service.
8. Provide removal, modification and/or replacement of ceilings.
9. Provide all required electrical power source, outlets and fused disconnects, wiring, conduit and power connections to system equipment.
10. Provide lighting source and convenience power outlets along horizontal and vertical pathway for maintenance and service of equipment.
11. Provide electrical control wiring, sensors, alarms and equipment required for smoke and/or fire detection system.
12. Provide and install all sound insulation or isolation treatment of the system and operating equipment.

Construction Site Services

The following items are related to the on-site construction process during the installation and testing of the system:

Cost 2

1. Provide unloading and carting of materials and equipment at job site from the common carrier to assigned storage area on site.

Cost 2

2. Provide safe, dry and adequate storage space on site for materials, tools, and work.
3. When required by applicable codes and inspecting authority, provide safety devices, guard rails, fire doors and enclosures.
4. Provide temporary electrical lighting and power for conveyor contractor's tools and equipment, toilet facilities and heat (during cold weather).
5. Provide hoisting and elevator services for conveyor contractor's work force and equipment.
6. Provide for the removal of debris (resulting from conveyor contractor's work) placed at location designated by purchaser or his agent.

Scope of Work in Unit B/C

The estimated costs of change order work in Unit B/C, for each of the systems except Transflex, are tabulated on a page which follows. Estimates are based on conditions which vary for each system and include factors for the relative length of pathways to be coordinated with present building systems; the number of new slab openings that require additional steel framing; the number of slab openings to be relocated and re-cut; the amount of additional rated and non-rated partitions required at shafts and stations; the number of access doors required and the approximate scope of electrical distribution required for drive motors, switches, controls, lighting and power outlets along system pathways.

Scope of Work in Mayo

It is assumed that change order costs for installing the pathway in Mayo Hospital with stations on Levels 1 and 2 near the present record lift will be approximately the same for each of the systems, excepting Transflex. The figures in the table which follows include work required to provide temporary protection and services and maintain operation of functions and circulation adjacent to the area of construction; remove existing plaster ceilings and lighting; cut and patch new openings in walls and slabs; demolish unused hoistway and equipment near record lifts; relocate ducts and piping as required; add shaft and station enclosures with access doors and finishes; and install new acoustic tile suspended ceiling with recessed or cove lighting in corridors, lobbies and selected rooms. The electrical distribution required for drive motors, switches, controls, lighting and power outlets along the pathway in Mayo Hospital is included with work in Unit B/C, separately tabulated for each system.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF CHANGE ORDER COST ESTIMATES

Scope of Work in Unit B/C

Assuming modifications are required at a maximum number of slab openings, the estimated total costs of change orders to install each of the transport systems (except Transflex) in Unit B/C are as follows:

	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
Relocation of slab openings at Level 2 (horizontal pathway)	\$ 5,000	\$ 5,000	\$ 4,000	\$ 5,000
Revision of slab openings at Levels 2-9 (vertical lift)	\$ 8,000	\$ 8,000	-	\$ 8,000
Additional rated partitions at shafts and stations	\$ 3,300	\$ 2,000	-	\$ 6,300
Additional non-rated partitions at stations	\$ 2,500	\$ 2,500	\$ 2,500	\$ 5,000
Additional rated access doors at shafts and stations	\$ 3,500	\$ 3,500	\$ 3,500	\$ 7,000
Additional non-rated access doors at stations	\$ 2,100	\$ 2,100	-	\$ 4,200
Allowance for modifications to other building systems	\$ 20,000	\$ 40,000	\$20,000	\$ 40,000
Electrical distribution from power source to remote components*	\$ 25,200	\$ 25,200	\$18,000	\$ 27,600
Electrical distribution and light fixture for maintenance*	\$ 30,800	\$ 30,800	\$28,700	\$ 27,300
Total labor and materials	\$100,400	\$119,100	\$76,700	\$130,400
Site services, contingencies, commissions and profit (30%)	\$ 30,120	\$ 35,700	\$23,000	\$ 39,100
Total cost of change orders	\$130,520	\$154,800	\$99,700	\$169,500

*includes work in Mayo Hospital

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF CHANGE ORDER COST ESTIMATES

Scope of Work in Mayo

The estimated total cost of change orders to install all of the transport systems (except Transflex) in Mayo Hospital is as follows:

<u>Item</u>	<u>Amount</u>
Removal of ceilings in Mayo corridors and rooms	\$ 900
Cutting and patching for new wall openings	\$ 2,500
Demolition and new work at station (Levels 1 and 2)	\$ 2,600
New acoustic tile ceilings in Mayo corridors and rooms	\$ 2,800
New plaster ceiling and cove in Mayo lobby	\$ 1,200
Relocation of mechanical and plumbing services	\$20,000
Removal of existing lighting fixtures in corridors	\$ 2,000
Installation of temporary lighting as required	\$ 2,000
Installation of new recessed lighting fixtures	\$ 4,500
Installation of new cove lighting	\$ 2,000
	<u>\$40,500</u>
Site services, contingencies, commissions and profit (30%)	<u>12,500</u>
Total cost of change order	<u>\$53,000</u>

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF CHANGE ORDER COST ESTIMATES

Summary

The total cost of change orders for work by the general and other contractors to install the transport system in Unit B/C and Mayo Hospital are as follows:

	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
Unit B/C	\$130,520	\$154,800	\$ 99,700	\$169,500
Mayo Hospital	<u>53,000</u>	<u>53,000</u>	<u>53,000</u>	<u>53,000</u>
Total	\$183,520	\$207,800	\$152,700	\$225,500

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF REDESIGN WORK

Revised Schedule of Stations

To install any of the transport systems proposed for Unit B/C, including Telelift (Mosler), design modifications and revisions to the present contract documents are required.

The following schedule indicates the stations which are likely to be modified based on code and installation requirements, recommendations contained in the Emmett Study and on projections to redevelop shell space:

Station	Floor	Slab Openings		Remarks
		Small	Large	
1 Clinical Laboratory	1	-		
2 Radiology	1	-		
3 Word Process	1	-		Relocate
4 Orthopedic, et. al.	1	-		
5 OB/Gyn	1	-		
6 Surgery/Urology	1	-		
7 Ambulatory Surgery	1	-		Delete
8 Medical Records	2	2		Relocate
9 Admissions	2	1		Delete
10 Business Office	2	1		Relocate
11 Pharmacy	2	2		
12 Medicine	2	1	1*	
13 Family Practice	3		1	
14 Pediatrics	4		1	
15 Neurology, et. al.	5		1	Shell
16 Psychiatry	6		1	Shell
17 Dental	7		1	Shell
18 ENT/Audiology	8		1	
19 Ophthalmology	9		1	
20 Mayo Hospital	2	<u>1</u>	<u> </u>	Add
Total Slab Openings		8	8*	

Slab Openings

The following comments refer to the number of slab openings required for stations and pathways:

1. Stations located on Level 1 do not require slab openings (7 stations) since the horizontal pathway is located below the slab and above the suspended ceiling at this level.

*see item 3 on the following page

Slab Openings

2. Slab openings for stations along the horizontal (one-way) pathway at Level 2 are smaller and require lighter structural framing than the slab openings for the vertical (two-way) pathway from Level 2 through Level 9.
- *3. One slab opening on the vertical pathway at Level 2 is independent of adjacent Station 12 (Medicine).
4. At high-volume Station 8 (Medical Records) and Station 11 (Pharmacy), the separate exit and entry paths for the Telelift system require 2 slab openings per station.

Summary of Basic Revisions

In addition to extending the system into Mayo Hospital, 8 of 19 stations in Unit B/C are likely to be revised (3 relocated, 2 deleted or relocated and 3 enclosed as shafts). The following general comments indicate the scope of basic redesign work required to install any of the materials transport system:

1. Rated shaft enclosures from floor to structural slab are required at 3 stations in shell space on Levels 5 through 7 to by-pass future Station 15 (Neurology/Neuro-Surgery), Station 16 (Psychiatry/Psychology) and Station 17 (Dental).
2. Slab openings and shaft enclosures will likely be relocated at 3 stations in shell space on Levels 1 and 2 in the redevelopment of departments at Station 3 (Word Processing), Station 8 (Medical Records) and Station 10 (Business Office).
3. Remote annunciator signal devices may be installed at 2 (or more) locations on Levels 1 and 2 if Station 7 (Ambulatory Surgery) and Station 9 (Admissions) are deleted to reduce installation costs.
4. Pathway conditions and station(s) at Levels 1 and/or 2 in Mayo Hospital must be developed in detail to extend the system beyond Unit B/C.

Pathway Revisions

Design modifications are required to install any other system except Telelift in space reserved for pathways and stations in Unit B/C. In a previous section describing clearances within the ceiling strata, the horizontal pathway layout for each of the proposed systems is compared to the present pathway.

Pathway Revisions

Where other pathways deviate from the Telelift pathway clearances for right-of-way, transfer points and drive mechanisms need to be coordinated with the structural, mechanical, plumbing, electrical lighting and fire protection systems, all of which are located in stratas above the suspended ceiling system at Level 1.

According to the proposed layouts, the horizontal pathways for the Pathfinder (Sovex-Marshall) and Telelift (Mosler) systems nearly coincide. By contrast approximately 20 percent of the horizontal pathway for the Distributor (Ada-Bec) system, 50 percent of the Horizontal/Vertical (Diebold) system and 95 percent of the Transflex (Anchor) system deviate from the horizontal Telelift system pathway in Unit B/C.

Station Revisions

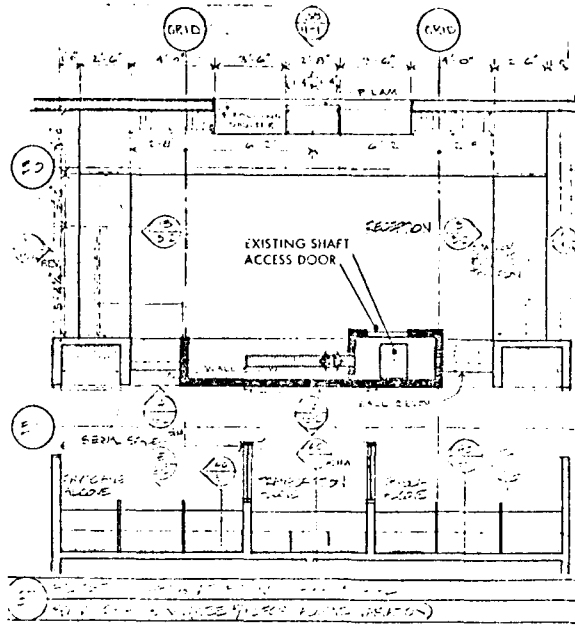
The configuration of typical stations on Levels 1 and 2 and upper Levels 3 through 9 for each of the systems except Transflex (Anchor) are shown on pages which follow. The diagrams indicate that the installation of the Pathfinder (Sovex-Marshall) or the Distributor (Ada-Bec) system requires minor relocation of slab openings, partitions, casework or ceiling elements within the general linear area reserved for the Telelift (Mosler) system at Levels 1 and 2.

The installation of the Horizontal/Vertical (Diebold) or the Transflex (Anchor) system requires modification to the basic conditions at a typical station, including slab opening size and structural framing; shaft size and proportion; adjacent work-counter configuration; partition and casework layout; number and location of access doors; and the ceiling tile and lighting fixture patterns. This amount of redesign work to accommodate the Diebold (or Anchor) system at Levels 1 and 2 is substantially more than required for other systems.

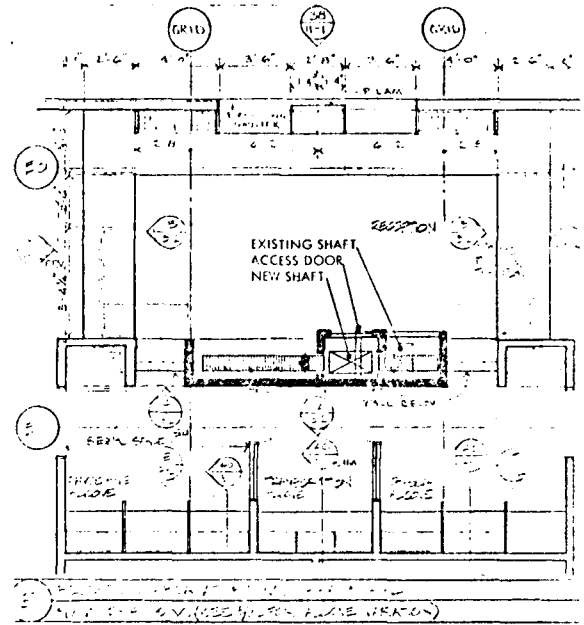
At upper levels 3 through 9, the shaft and receiving platform for each of the systems are more similar in configuration and generally retain most of the partition, casework and ceiling elements adjacent to the station enclosure. Space requirements range from approximately 45 square feet for the Pathfinder, Distributor and Telelift systems to 75 square feet for the Horizontal/Vertical system.

The slab openings for the systems vary in size, orientation and proportion. To accommodate systems other than Telelift, modifications are required to relocate one or two minor beams below the steel deck and to alter the configuration of the slab opening.

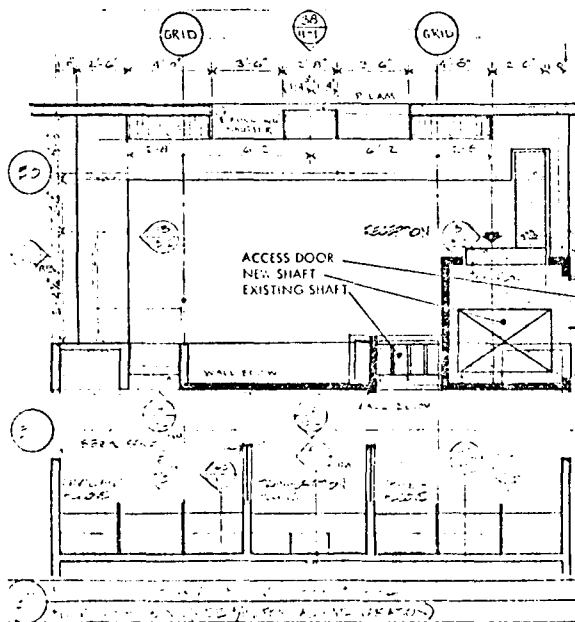
The plans below indicate the layout of riser shaft(s) with receiving and dispatch tables for each of the systems at Station 12 (Medicine), a typical condition on Levels 1 & 2:



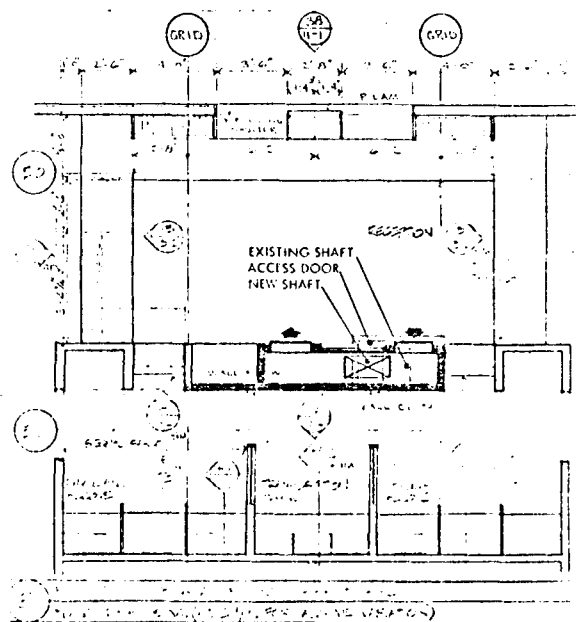
Telelift System (Mosler)



Distributor System (Ada-Bec)

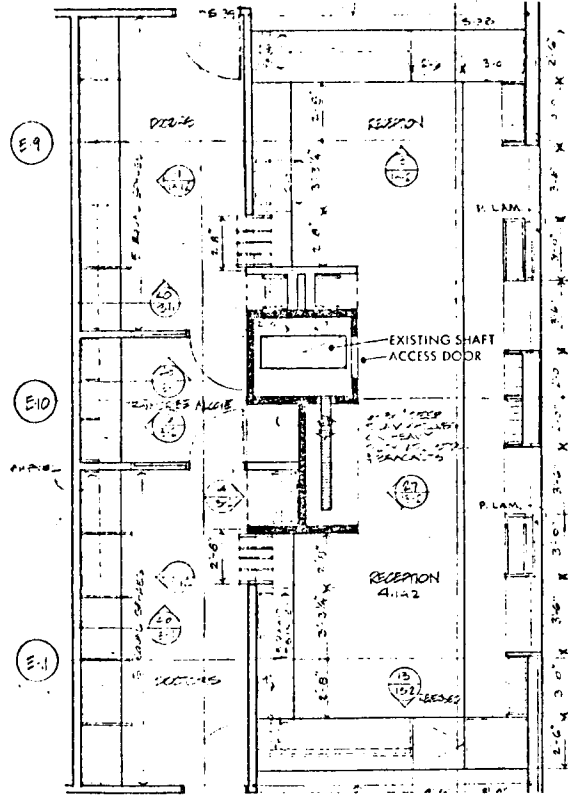


Horizontal-Vertical System (Diebold)

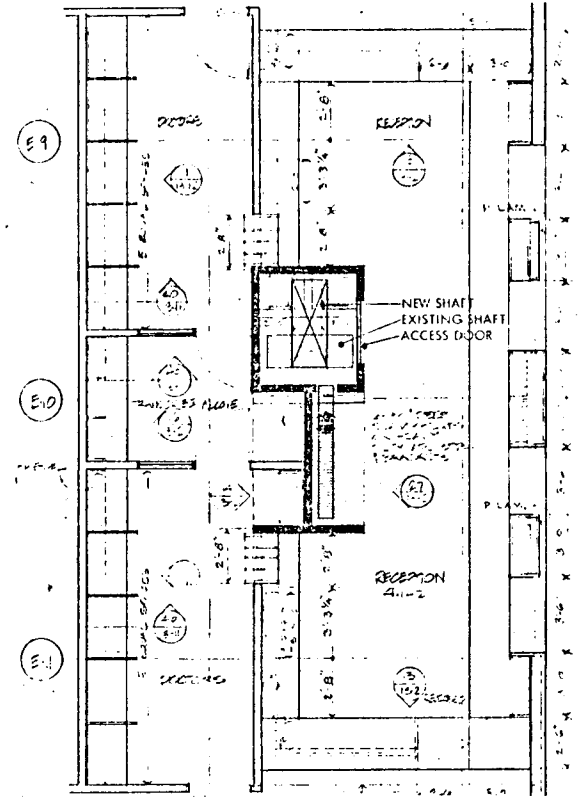


Pathfinder System (Sovex-Marshall)

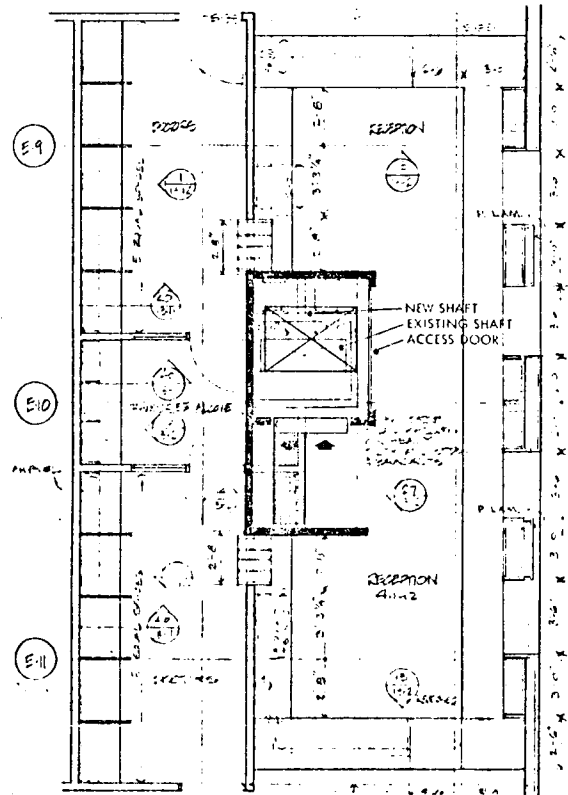
The plans below indicate the configuration of the riser shaft with receiving and dispatch tables for each of the systems at a typical station on Levels 3 through 9:



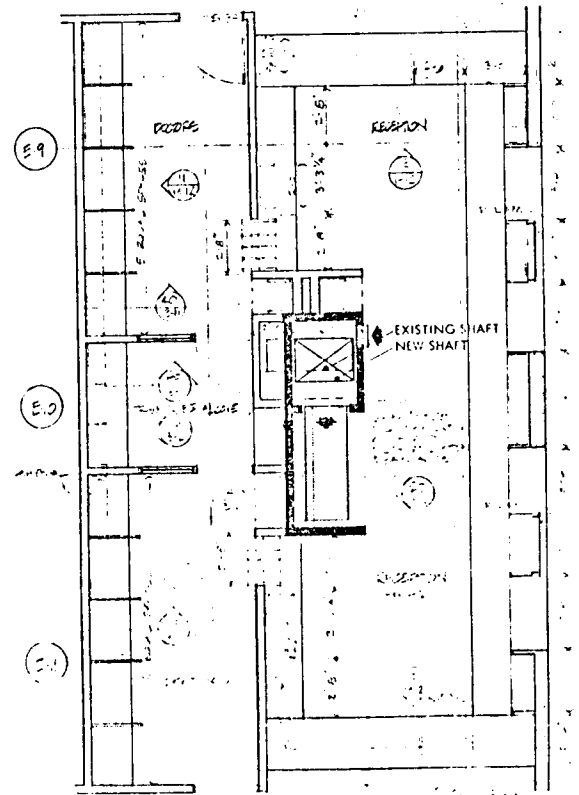
Telelift System (Mosler)



Distributor System (Ada-Bec)



Horizontal-Vertical System (Diebold)



Pathfinder System (Sovex-Marshall)

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF PROJECT COSTS

Total Building Costs

The following summaries combine the cost estimates for the procurement and installation of system hardware as contained in the proposals by vendors and the related change order modifications and construction work by the owner to indicate the total building costs for each system except Transflex (Anchor):

	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
Vendor Proposals:				
System in Unit B/C	\$ 402,500	425,000	480,291	600,000
System in Mayo	60,000	65,000	66,091	130,000
Total Estimate	\$ 462,500	490,000	546,382	730,000
Change Orders:				
System in Unit B/C	\$ 130,520	154,800	99,700	169,500
System in Mayo	53,000	53,000	53,000	53,000
Total Estimate	\$ 183,520	207,800	152,700	225,500
Total System:				
Vendor Proposals	\$ 462,500	490,000	546,382	730,000
Change Orders	183,520	207,800	152,700	225,500
Total	\$ 646,020	697,800	699,082	955,500

The following summaries indicate the separate building costs of the non-scheduled materials transport system in Unit B/C and Mayo Hospital:

	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
Unit B/C:				
Vendor Proposals	\$402,500	425,000	480,291	600,000
Change Orders	130,520	154,800	99,700	169,500
Total	\$533,020	579,800	579,991	769,500
Mayo Hospital:				
Vendor Proposals	\$ 60,000	65,000	66,091	130,000
Change Orders	53,000	53,000	53,000	53,000
Total	\$113,000	118,000	119,091	183,000

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF PROJECT COSTS

Non-Building Costs

Assuming the scope of redesign and change order work as discussed in previous sections, the estimated non-building costs are tabulated as follows:

	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
Basic Services (A/E):				
Summary of Assumptions				
Instructions to Vendors				
Site Visits				
Summary of Vendor Proposals *	\$ 51,540	51,450	51,450	51,450
Bid Documents and Award	6,000	6,000	6,000	6,000
Unit B/C Change Orders (7%)				
System in Mayo Hospital (7%)	\$ 9,136	10,836	6,979	11,865
	3,710	3,710	3,710	3,710
Total	\$ 70,386	72,086	68,229	73,115
Reimbursables (A/E):				
Travel Expenses				
Consultants				
Printing and Telephone				
Total	\$ 16,600	16,600	16,600	16,600
Supervision (U/M):				
Unit B/C Change Orders (1 1/4%)	\$ 1,631	1,935	1,246	2,118
System in Mayo Hospital (1 1/4%)	662	662	662	662
Total	\$ 2,293	2,597	1,908	2,780
Contingency (U/M):				
Unit B/C Change Orders (5%)	\$ 6,526	7,740	4,985	8,475
System in Mayo Hospital (5%)	2,650	2,690	2,690	2,650
Total	\$ 9,176	10,390	7,635	11,125
Administration Review (U/M):				
Development of Assumptions				
Site Visits				
Review				
Total	_____	_____	_____	_____
Initial Training (U/M):				
Operation of System				
Maintenance of System				
Total	_____	_____	_____	_____

*Services through completed phase 25 June 1976

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF PROJECT COSTS

Summary of Project Costs

The following figures combine the estimated building and non-building costs exclusive of Hospital administrative and training expenses to summarize the total project costs:

	Sovex-Marshall PATHFINDER	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Diebold HORIZ/VERT
Building Costs:				
Vendor Proposals	\$462,500	490,000	* 546,382	730,000
Change Orders	183,520	207,800	* 152,700	225,500
Non-Building Costs:				
Basic Services (A/E)	70,386	72,086	* 68,229	73,115
Reimbursables (A/E)	16,600	16,600	* 16,600	16,600
Suspension (U/M)	2,293	2,597	* 1,908	2,780
Contingency (U/M)	9,176	10,390	* 7,635	11,125
Administrative Review (U/M)	-	-	-	-
Initial Training (U/M)	-	-	-	-
TOTAL	\$744,475	799,473	793,454	1,059,120

First Addendum to conditions, specifications, related documents and drawings entitled:

RECEIVED

UNIT B/C OF THE
UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION
PROJECT NO. MINN. 18 (HP)
MATERIALS TRANSPORT SYSTEM

NOV 8 1976

UNIV. OF MINN.
HEALTH SCIENCE
PLANNING OFFICE

THE ARCHITECTS COLLABORATIVE Inc. Cambridge, Massachusetts

HEALTH SCIENCES ARCHITECTS AND ENGINEERS, INC.
2829 University Avenue, Minneapolis, Minnesota 55414

The additions, revisions, omissions, corrections and clarifications contained herein shall be made to the Drawings and Specifications for the project and shall be included in scope of work and in the bids to be submitted. All bids and the construction documents shall be based on these modifications.

Each Bidder shall notify such sub-bidders as may be affected by this Addendum.

The Owner wishes to draw the Bidders' attention to the conditions already stated as to the basis of award; that is, award will be based on price and performance together, rather than either price or performance.

The Bidders' attention is directed to a new bid opening time and date of 10:00 A.M. on November 16, 1976. This is an extension of the date established in the ADVERTISEMENT FOR BIDS and INSTRUCTIONS TO BIDDERS.

SPECIFICATION REVISIONS:

Item 1: Table of Contents: In place of Table of Contents page originally provided with the documents, insert new Table of Contents page, attached hereto.

Item 2: Page A2-2, Paragraph 2.2.6: Delete as written and insert therefor the following:

"2.2.6 The Bid shall be deemed to not include any additional stipulations or alternates or qualifications except as specifically provided for in a letter, on the Bidder's letterhead, signed and sealed as per the Bid Form, and attached to the Bid. In that letter the Bidder shall: identify all assumptions that will affect the cost of the work; note conflicts between the Drawings and

Specifications with respect to the Bidder's standard products and installation procedures; note existing obstructions along the pathway not now indicated on the Drawings; propose alternatives that could lower the cost of the work; and identify any other aspects significant to the bid."

Item 3: Page A2-10, Paragraph 15.1.1: Change "minimum wage rate requirements of the Federal government" to read "minimum wage rate requirements as included in these documents".

Item 4: Page A2-12, Paragraph 18.1.2: Change last sentence to read:

"Arrangements shall be coordinated between Paul Maupin of the University's Health Sciences Planning Office (Phone 612-373-8981) and Eugene Kogl, Project Construction Analyst at the University (Phone 612-373-4522)."

Item 5: Pages C-48 thru C-54: Delete Article 17, since this project is not a Federally assisted construction project.

Item 6: Wage Rates: In place of the 9 pages of wage rates originally provided with the documents, insert the wage rates pages C2-1 thru C2-15 attached hereto.

Item 7: Page 14700-4, Paragraph 2.2, Subparagraph D: In third line change "all" to "off", and in last line change "park" to "peak".

Item 8: Page 14700-6, Paragraph 2.4, Subparagraph F: Change horizontal speed to approximately 120 feet per minute", and change vertical speed to "approximately 90 feet per minute".

Item 9: Page 14700-12, Paragraph 3.4: Add:

"D. Within the system, the minimum time requirement for one-way carrier travel between any two stations in Unit B/C shall be 10 minutes, and the minimum time for one-way carrier travel between any station in Unit B/C and Mayo Station shall be 15 minutes."

Item 10: New Section: After Section 14700 insert new Section 14701, attached hereto.

DRAWING REVISIONS:

Item 11: Drawing MTS1: Add the following notes:

"8. Provide independent dispatch control both sides of Station 11 (Pharm. - T & D).

9. Increase station capacity by providing additional on-line storage for incoming cars at Stations 8, 11, 20 and 21, as required for peak traffic conditions.

10. In addition to the stations on the Station Lists, this sheet (including shell space stations), provide for future expansion of system to a total of up to 30 stations."

Item 12: Drawing MTS1, 1 Station List: Add the following:

STATION LIST (Alternate as per Section 14701)

STATION NUMBER	FLOOR NUMBER	STATION DESIGNATION	STATION TYPE	NUMBER CARS	REMARKS
1	1	Clinical Lab	B On Line	6	
2	1	Radiology	B On Line	6	
3	1	Word Processing	B End	6	
4	1	Orthopedic	B On Line	6	
5	1	OB/GYN	B On Line	6	
6	1	Surgery/Urology	B On Line	6	
7	1	Ambulatory Surgery	B End	6	Alternate MTS-4
8	2	Medical Records	C End	6	Reject Station
10	2	Business Office	C End	6	Alternate MTS-5
11	2	Pharmacy, T&D Dispensing	C On Line	6	Access both sides
12	2	Medicine	C On Line	6	
13	3	Family Practice	A Transfer	6	
14	4	Pediatrics	A Transfer	6	
15	5	Neurology	A Transfer	6	Alternate MTS-3
16	6	Psychiatry	A Transfer	6	Alternate MTS-2
17	7	Dental	A Transfer	6	Alternate MTS-1
18	8	ENT/Audiology	A Transfer	6	
19	9	Ophthalmology	A Transfer	6	
20	1	Mayo 1	B End	6	Alternate MTS-6
21	2	Mayo 2	C End	6	Alternate MTS-7

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BID FORM REVISIONS:

Item 13: In place of Pages A5-1 through A5-5, insert new Pages A5-1 through A5-6, attached hereto, on which bids shall be submitted.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

<u>TABLE OF CONTENTS</u>	<u>PAGES</u>
<u>ALL CONTRACTS</u>	
PROJECT IDENTIFICATION	
Title Page	1 Page
Table of Contents	1 Page
DIVISION A - BIDDING REQUIREMENTS	
A1 Advertisement for Bids	A1-1 thru A1-2
A2 Instruction to Bidders	A2-1 thru A2-12
A3 Bid Form	A3-1 thru A3-6
A4 Bid Bond	A4-1
A5 Equal Opportunity and Affirmative Action Program Forms	A5-1 thru A5-5
DIVISION B - CONTRACT FORMS	
B1 Agreement	B1-1 thru B1-4
B2 Contractor's Bond	B2-1 thru B2-2
DIVISION C - CONDITIONS OF THE CONTRACT	
C1 General Conditions	C-1 thru C-54
C2 Wage Rate Determination	C2-1 thru C2-15
DIVISION 1 - GENERAL REQUIREMENTS	
01010 Summary of Work and Special Requirements	01010-1 thru 01010-19
01100 Description of Alternates	01100-1 thru 01100-3
01150 Payment	01150-1 thru 01150-3
01200 Contract Time	01200-1 thru 01200-2
01250 Construction Schedule	01250-1 thru 01250-4
01300 Submittals	01300-1 thru 01300-4
01400 Not Used	
01500 Temporary Facilities	01500-1 thru 01500-7
01700 Project Close Out	01700-1 thru 01700-4
DIVISION 2 - 12 (Not Used)	
DIVISION 14 - TECHNICAL SPECIFICATIONS	
14700 Materials Transport System	14700-1 thru 14700-12
14701 Materials Transport System (Alternate)	14701-1 thru 14701-15
MATERIALS TRANSPORT SYSTEM	CONTENTS

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Basic Wage Rate Per Hour		
	Eff. 10/1/75	Eff. 5/1/76	Eff.
Anoka			
Carver			
Chisago			
Dakota			
Hennepin			
Isanti			
Pine			
Ramsey			
Scott			
Sherburne			
Washington			
Wright			

Other Building Work	Basic Wage Rate Per Hour		
	Eff. 10/1/75	Eff. 5/1/76	Eff.
Laborers			
<u>Classifications</u>			
Air Actuated Tool	\$ none	\$ none	\$ none
Bituminous Baker, floater & utility man	none	none	none
Bituminous Shoveler	none	none	none
Block Tender	none	none	none
Block Tender handling 12 inch concrete blocks or larger	none	none	none
Bottom man (sewer, water or gas trench)	none	none	none
Bricklayer Tender	none	none	none
Burning Torch Demolition	7.45	7.80	none
Carson worker	7.70	8.15	none
Carpenter Tender	7.35	7.80	none
Cement Coverman (batch trucks)	none	none	none
Cement Gun Operator (1 1/2" and over)	none	none	none
Cement Hand Mixer	none	none	none
Cement Handler (bag or bulk - over 2 hrs. per day)	none	none	none
Cement Mortar (1 bag)	none	none	none

County	Basic Wage Rate Per Hour		
	Eff. 10/1/75	Eff. 5/1/76	Eff.
Anoka			
Carver			
Chisago			
Dakota			
Hennepin			
Isanti			
Pine			
Ramsey			
Scott			
Sherburne			
Washington			
Wright			

Other Building Work	Basic Wage Rate Per Hour		
	Eff. 10/1/75	Eff. 5/1/76	Eff.
Laborers			
<u>Classifications</u>			
Chain Saw Man	\$ none	\$ none	\$ none
Chipping Hammer Operator	7.50	7.95	none
Cofferdam Work	none	none	none
Common Laborer	7.35	7.80	none
Compaction Equipment (Hand operated)	none	none	none
Concrete Mixer Operator (1 bag capacity)	none	none	none
Concrete Shoveler, Tamper & Puddler (paving)	7.50	7.95	none
Concrete Vibrator Operator	7.50	7.95	none
Conduit Layers (without wire)	none	none	none
Ditch Man	none	none	none
Drill Runner (wagon, truck, etc.)	none	none	none
Dump Man	none	none	none
Dynamite Men - power drillers (for blasting purposes & tunnel miners)	8.055	8.50	none
Dynamite Man	8.055	8.50	none
Earth Dump Man	7.35	7.80	none
Flagman	7.75	7.80	none
Formsetter (municipal type curb, sidewalk)	none	none	none
Formsetter (pavement)	none	none	none
Gunite Machine Operator	none	none	none
Hand Frame - pneumatic concrete & power operated tamper operator	none	none	none
Handling Creosote	none	none	none
Hod Carrier	none	none	none
Hot Tar Caulker & Corker	7.50	7.95	none
House Moving	none	none	none
Jackhammer Man Operator	7.50	7.95	none
Joint Sawyer Operator	7.45	7.80	none
Kettleman (bituminous or lead)	none	none	none
Laborer on rope swing scaffold (not safety scaffold)	7.50	7.95	none
Leadman	none	none	none
Landscape gardner, sod layer & nurseryman	none	none	none
Mason Tender	7.45	7.80	none
Men handling cement (2 hours per day) (bulk or sack excluding Mortar Mix)	7.45	7.90	none
Men unloading cars of dry sack cement or bulk cement (over 4 hours per day)	none	none	none
Miner Helper	none	none	none
Mortar Mixers	7.50	7.95	none
Nozzelman	7.75	8.20	none

FRINGE BENEFITS - In addition to the wages set forth herein, 40¢ shall be paid into the Health and Welfare Fund, 45¢ per hour to the Pension Fund, plus 40¢ per hour to the Vacation Fund, effective 10/1/75.

Effective 5/1/76 Health & Welfare - 45¢, Pension - 45¢, Vacation - 40¢.

NOTICE TO BIDDERS, WAGE DETERMINATIONS

The wage determinations include classifications which the Commissioner of the Department of Labor and Industry has determined to be the classes of labor and mechanics commonly employed in building construction work. Additional classifications may develop between certifications by the Commissioner. Therefore, no inference may be drawn from the omission of classifications which have local usage. Further, the state will not be liable for increased labor costs if and when additional classifications are subsequently required or wage rates increase prior to the awarding of contracts.

UM HEALTH SCIENCES
 UNIT B/C C2-1
 MATERIALS TRANSPORT SYSTEM

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1975 - Chapter 724
 10/1/75

County Anoka Hennepin Scott
 Carver Isanti Sherburne
 Chisago Pine Washington
 Dakota Ramsey Wright

Other Building Work

Basic Wage Rate Per Hour

Laborers

Eff. Eff. Eff.
 10/1/75 5/1/76

Classifications

Paving Buster	\$ 7.50	\$ 7.95	\$ none
Paving Breaker Operator	none	none	none
Pipe Layer Gas	7.65	8.10	none
Plasterer Tender	none	none	none
Powderman	none	none	none
Power Buggy Operator	7.35	7.80	none
Power Drillers for blasting purposes	8.055	8.50	none
Pumpman Operator	none	none	none
Pump Operator (3" and under)	none	none	none
Rebar Operator	none	none	none
Reinforced Steel Handler	7.40	7.85	none
Salamander Heater & Blower Tender	7.50	7.95	none
Sheeting Setters & Drivers or Heavy Building Excavation	none	none	none
Signal Man	7.45	7.90	none
Snowblower Operator	none	none	none
Steel Joist Handler (erection)	7.55	7.80	none
Stone Mason Tender	none	none	none
Tunnel Laborer (atmospheric pressure)	none	none	none
Tunnel Miner	none	none	none
Tunnel Work	none	none	none
Underground Work (8 feet or more below the adjoining ground where the excavation is not more than 8 feet wide)	7.60	8.05	none
Underpinning Work	7.70	8.15	none
Watchman	6.35	6.80	none
Wrecking & Demolition (not including remodeling)	7.45	7.90	none
Foreman	7.85	8.35	none

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1975 - Chapter 724
 10/1/75

County Aitkin Crow Wing Jackson Morrison Scott
 Anoka Dakota Kanabec Mower Sherburne
 Beltrami Dodge Koochiching Nicollet Sibley
 Benton Faribault Lake Nobles Stearns
 Big Stone Fillmore Lake of the Olmsted Steele
 Blue Earth Freeborn Woods Pine Todd
 Brown Goodhue LeSueur Pipestone Wabasha
 Carlton Hennepin Mahnomon Ramsey Wadena
 Carver Houston Martin Red Lake Waseca
 Chisago Hubbard McLeod Rice Washington
 Clearwater Isanti Meeker Rock Wilkin
 Cook Itasca Mille Laos St. Louis Winona
 Grant Lincoln Roseau Traverse Wright

Other Building Work

Basic Wage Rate Per Hour

Power Equipment Operators

Eff. Eff. Eff.
 10/1/75 5/1/76 5/1/77

Classifications

Air Compressor Operator, 375 CFM or over, Pump and/or Conveyor Operator, Fireman, Temporary Heat	\$ 8.90	\$ 9.55	\$ 10.20
Air Compressor Operator, 375 CFM or over, Pump Operator and/or Conveyor Operator, 2 or more Machines	9.53	10.18	10.83
Doom Truck Operator	9.45	10.10	10.75
Brakeman	8.90	9.55	10.20
Concrete Batch Plant Operator	9.18	9.83	10.45
Concrete Mixer Operator	9.45	10.10	10.75
Derrick (Guy or Stiff Leg)	9.65	10.30	10.95
Drill Rigs - Heavy Rotary or Churn when used for Caisson drilling for elevator cylinder on building construction	9.45	10.10	10.75
Fireman, Chief License	9.75	10.40	11.05
Fireman, 1st Class License	9.18	9.83	10.45
Fork Lift Operator	9.55	10.18	10.83
Front End Loader Operator	9.45	10.10	10.75
Gunite Operator	9.18	9.83	10.45
Helicopter Operator (hoisting material)	12.85	15.50	17.15
Hoist Engineer (One Drum)	9.45	10.10	10.75
Hoist Engineer (Two Drums)	9.55	10.18	10.83
Hoist Engineer (Three Drums or More)	9.65	10.30	10.95
Locomotive Operator	9.65	10.30	10.95
Master Mechanic	9.90	10.55	11.20
Mechanic or Welder	9.55	10.18	10.83
Mechanical Space Heater (Temporary Heat)	8.45	9.10	9.75

FRINGE BENEFITS - Plus 45¢ payable to the Health & Welfare Fund, and 35¢ payable to the Pension Fund beginning 10-1-75.

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 UNIT B/C C2-2
 MATERIALS TRANSPORT SYSTEM

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
Laws 1973 - Chapter 724
10/1/75

County	Aitkin	Crow Wing	Jackson	Morrison	Scott
	Anoka	Dakota	Kanabec	Nower	Sherburne
	Beltrami	Dodge	Koochiching	Nicollet	Sibley
	Benton	Faribault	Lake	Nobles	Stearns
	Big Stone	Fillmore	Lake of the	Olmsted	Steele
	Blue Earth	Freeborn	Woods	Pine	Todd
	Brown	Goodhue	LeSueur	Pipestone	Wabasha
	Carlton	Hennepin	Mahnomen	Ramsey	Wadena
	Carver	Houston	Martin	Red Lake	Waseca
	Chisago	Hubbard	McLeod	Rice	Washington
	Clearwater	Isanti	Meeker	Rock	Wilkin
	Cook	Itasca	Mille Lacs	St. Louis	Winona
	Grant	Lincoln	Roseau	Traverse	Wright

Other Building Work	Basic Wage Rate Per Hour		
	Eff. 10/1/75	Eff. 5/1/76	Eff. 5/1/77
Power Equipment Operators			
<u>Classifications</u>			
Oiler or Greaser	\$ 8.45	\$ 9.10	\$ 9.75
Overhead Crane Operator (Inside building perimeter)	9.65	10.30	10.95
Pick-up Sweeper (1 cu. yd. & over hopper capacity)	8.90	9.55	10.20
Power Plant Engineer (100 KWH & over on Multiples equal to 100 KWH and over)	9.45	10.10	10.75
Pumperete and Concrete Pumping Machine Operator	9.53	10.18	10.83
Straddle Carrier Operator	9.45	10.10	10.75
Tower Cranes - stationary	9.65	10.30	10.95
Tractor Operator, D-2 or similar size and Front End Loader Operator up to 1 cu.yd.	9.13	9.83	10.43
Tractor Operator, Over D-2	9.45	10.10	10.75
Tractor Operator with Boom	9.65	10.30	10.95
Traveling Tower Cranes	10.00	10.65	11.30
Truck and Crawler Cranes up to and not including 150 ft. of boom including jib	9.65	10.30	10.95
Truck and Crawler Cranes with 150 ft. of boom up to and not including 200 ft. of boom including jib	10.10	10.75	11.40
Truck and Crawler Cranes with 200 ft. of boom and over including jib	10.45	11.10	11.75
Truck Crane Oiler	8.90	9.55	10.20
Welding Machine Operator	8.90	9.55	10.20
Well Point Pump Operator	9.45	10.10	10.75

UM HEALTH SCIENCES
UNIT B/C C2-3
MATERIALS TRANSPORT SYSTEM

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
Laws 1973 - Chapter 724
10/1/75

County	Anoka	Cook	Lake	Sherburne
	Carlton	Dakota	Ramsey	Washington
	Carver	Hennepin	St. Louis	Wright
	Chisago	Itasca	Scott	

Truck Drivers	Basic Wage Rate Per Hour		
	Eff. 10/1/75	Eff. 5/1/76	Eff.
<u>Classifications</u>			
<u>Group 1 (Five axels or more)</u>			
Truck Driver (hauling machinery for Employer's own use, including operation of hand and power operated winches)	\$ 8.25	\$ 8.75	\$ none
Truck Trains	8.25	8.75	none
Mechanic-Welder	8.25	8.75	none
Tractor Trailer Driver	8.25	8.75	none
Off-Road Truck Driver	8.25	8.75	none
<u>Group 2</u>			
Tri Axle Trucks	7.95	8.45	none
<u>Group 3</u>			
Bituminous Distributor Driver	7.85	8.35	none
Bituminous Distributor (one man operation)	7.85	8.35	none
Tandem Axle Trucks	7.85	8.35	none
Slurry Drivers	7.85	8.35	none
<u>Group 4</u>			
Bituminous Distributor Spray Oper. (Rear End Oiler)	7.65	8.15	none
Boom and "A" Frame Driver	7.65	8.15	none
Dumpman	7.65	8.15	none
Greaser and Truck Serviceman	7.65	8.15	none
Pilot Car Driver	7.65	8.15	none
Ready-Mix Concrete Truck Driver	7.65	8.15	none
Tank Truck Helper (gas,oil,road oil & water)	7.65	8.15	none
Teamster & Stableman	7.65	8.15	none
Tractor Oper. (wheel type used for any purpose)	7.65	8.15	none
Self-Propelled Packer	7.65	8.15	none
Slurry Operator	7.65	8.15	none
Single Axle Trucks	7.65	8.15	none

FRINGE BENEFITS - In addition to the wages as set forth herein, an additional 35¢ shall be paid into the Health & Welfare Fund, plus 45¢ per hour payable to the Pension Fund, effective 10/1/75.
Effective 5/1/76 - Health & Welfare Pension 40¢ per hour
45¢ per hour

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
Laws 1973 - Chapter 724

10/1/75

MINIMUM RENTAL RATES FOR TRUCK HIRE

Paid To Those Who Own And Operate The Truck For
All Counties Of The State

All minimum rates listed in the following schedule include compensation for all costs of operating such trucks except the owner-operator's wages and workmen's compensation insurance or any other assessments or taxes based on such wages.

TRUCKS, TRACTORS, TRAILERS, ETC.

Trucks, tractors and trailers and trailing units shall be paid for on the following hourly basis. (This shall be payment in full.)

Service/Utility Truck Rates based on manufacturers ratings shall be:

Pickups of all classes	1.50/hr.
1 Ton & 1½ Ton	1.75/hr.
2 Ton	2.10/hr.
2½ Ton	3.00/hr.

Dump Trucks and Trailing units will be paid for on the following basis:

Trucks	5 cy	4.80	9½ cy	8.50
	6 cy	5.30	10 cy	8.85
	8 cy	7.50	12 cy	9.50
	8½ cy	7.80	14 cy	10.55
	9 cy	8.15	16 cy	11.10
			over 16 cy	11.90

Pups 3.90

Special consideration will be given when other than ordinary conditions exist.

Specially equipped trucks shall be paid for at a rate combining equipment and truck rental rates on a monthly basis.

PREVAILING HOURS OF LABOR

The "prevailing hours of labor" for all classes of laborers and mechanics to be employed on State contract highway construction work are eight hours per day and forty hours per calendar week.

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UNIT B/C C2-4
MATERIALS TRANSPORT SYSTEM

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
Laws 1973 - Chapter 724

10/1/75

County	Anoka	Grant	Olmsted	Winona
	Benton	Hennepin	Ramsey	Wright
	Big Stone	Houston	Rice	
	Blue Earth	Isanti	Scott	
	Brown	Kanabec	Sherburne	
	Carver	LeSueur	Sibley	
	Chisago	McLeod	Stearns	
	Dakota	Martin	Steele	
	Dodge	Meeker	Todd	
	Faribault	Hille Lacs	Traverse	
	Fillmore	Morrison	Wabasha	
	Freeborn	Mower	Waseca	
	Goodhue	Nicollet	Washington	

Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff.	Eff.	Eff.
10/1/75	6/1/76	

Classification

Asbestos Worker

\$ 9.82	\$ 10.57	\$ none
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DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County Anoka Isanti
 Carver Ramsey
 Chisago Scott
 Dakota Washington
 Hennepin Wright

Other Building Work

Special Trades

Basic Wage Rate & Fringe
 Benefits Per Hour

Eff. Eff. Eff.
 10/1/75 10/15/75 5/1/76

Classification

Bricklayers/Stone Masons \$ 10.355 \$ 10.555 \$ 11.155

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Aitkin	Hubbard	Pipestone
	Anoka	Isanti	Ramsey
	Beltrami	Itasca	Red Lake
	Benton	Jackson	Rice
	Big Stone	Kanabec	Rock
	Blue Earth	Koochiching	Roseau
	Brown	Lake	St. Louis
	Carlton	Lake of the Woods	Scott
	Carver	LeSueur	Sherburne
	Chisago	Lincoln	Sibley
	Clearwater	Mahnomen	Stearns
	Cook	Martin	Steele
	Crow Wing	McLeod	Todd
	Dakota	Mecker	Traverse
	Dodge	Mille Lacs	Wabasha
	Faribault	Morrison	Wadena
	Fillmore	Nower	Waseca
	Freeborn	Nicollet	Washington
	Goodhue	Nobles	Wilkin
	Grant	Olmsted	Winona
	Hennepin	Pine	Wright
	Houston		

Other Building Work

Special Trades

Basic Wage Rate & Fringe
 Benefits Per Hour

Eff. Eff. Eff.
 10/1/75 10/1/75

Classification

Boilermaker \$ 11.17 \$ none \$ none

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Aitkin Anoka Beltrami Benton Big Stone Blue Earth Brown Carlton Carver Chisago Clearwater Cook Crow Wing Dakota Dodge Paribault	Fillmore Freeborn Goodhue Grant Hennepin Houston Hubbard Isanti Itasca Jackson Kanabec Koochiching Lake Lake of the Woods LeSueur Lincoln	Mahnomen Martin McLeod Meeker Mille Lacs Morrison Mower Nicollet Nobles Olmsted Pine Pipestone Ramsey Red Lake Rice Rock	Roseau St. Louis Scott Sherburne Sibley Stearns Steele Todd Traverse Wabasha Wadena Waseca Washington Wilkin Winona Wright
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Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff. 10/1/75	Eff. 5/1/76	Eff. 5/1/77
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Classification

Carpet/Linoleum Layers

\$ 9.52 \$ 10.52 \$ 11.30

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Anoka Carver Chisago Dakota Hennepin Isanti Kanabec (Southern part)	McLeod (Eastern part) Mille Lacs (Lower east half) Pine (Southern part) Ramsey Scott Sherburne (Eastern half) Washington Wright
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Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff. 10/1/75	Eff. 5/1/76	Eff.
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Classification

Carpenter

\$ 10.11 \$ 10.51 \$ none

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Aitkin	Hubbard	Pipestone
	Anoka	Isanti	Ramsey
	Beltrami	Itasca	Red Lake
	Benton	Jackson	Rice
	Big Stone	Kanabec	Rock
	Blue Earth	Koochiching	Roseau
	Brown	Lake	St. Louis
	Carlton	Lake of the Woods	Scott
	Carver	LeSueur	Sherburne
	Chisago	Lincoln	Sibley
	Clearwater	Mahnomen	Stearns
	Cook	Martin	Steele
	Crow Wing	McLeod	Todd
	Dakota	Meeker	Traverse
	Dodge	Mille Lacs	Wabasha
	Faribault	Morrison	Wadena
	Fillmore	Mower	Waseca
	Freeborn	Nicollet	Washington
	Goodhue	Nobles	Wilkin
	Grant	Olmsted	Winona
	Hennepin	Pine	Wright
	Houston		

Other Building Work

Special Trades

Basic Wage Rate & Fringe Benefits Per Hour

Eff.	Eff.	Eff.
10/1/75	11/1/75	
\$ 9.04	\$ 9.24	\$ none
<u>9.93</u>	<u>10.13</u>	<u>10.71</u>

Classification

Tile & Marble Helper
 Marble Setter

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DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Aitkin (Southern part)	Freeborn	Meeker	Scott
	Anoka	Goodhue	Mille Lacs	Sherburne
	Beltrami	Grant	Morrison	Sibley
	Benton	Hennepin	Mower	Stearns
	Big Stone	Houston	Nicollet	Steele
	Blue Earth	Hubbard	Nobles	Todd
	Brown	Isanti	Olmsted	Traverse
	Carver	Jackson	Pino	Wabasha
	Chisago	Kanabec	Pipestone	Wadena
	Clearwater	LeSueur	Ramsey	Waseca
	Crow Wing	Lincoln	Red Lake	Washington
	Dakota	Mahnomen	Rice	Wilkin
	Dodge	Martin	Rock	Winona
	Faribault	McLeod	Roseau	Wright
	Fillmore			

Other Building Work

Special Trades

Basic Wage Rate & Fringe Benefits Per Hour

Eff.	Eff.	Eff.
10/1/75		

Classification

Millwright

\$ 10.13	\$ none	\$ none
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DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County Anoka Kanabec
 Carver Scott
 Hennepin Sherburne (Southern part)
 Isanti Wright
 McLeod

Other Building Work

Special Trades

Basic Wage Rate & Fringe
 Benefits Per Hour

Eff. 10/1/75	Eff. 11/1/75	Eff. 5/1/76
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Classification

Painters	Eff. 10/1/75	Eff. 11/1/75	Eff. 5/1/76
Brush	\$ 9.65	\$ 10.02	\$ 10.32
Structural Steel	10.15	10.50	10.82
Spray	10.15	10.50	10.82
Swing Stage	10.15	10.50	10.82

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County Anoka Mille Lacs
 Carver Scott
 Hennepin Sherburne (Eastern part)
 Isanti Wright
 McLeod

Other Building Work

Special Trades

Basic Wage Rate & Fringe
 Benefits Per Hour

Eff. 10/1/75	Eff.	Eff.
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Classification

Pipefitter/Steamfitter	\$ 10.31	\$ none	\$ none
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DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Anoka Carver Hennepin Isanti Kanabec McLeod	Mille Lacs Scott Sherburne Sibley Wright	Basic Wage Rate & Fringe Benefits Per Hour		
			Eff. 10/1/75	Eff. 5/1/76	Eff.
Other Building Work					
Special Trades					
<u>Classification</u>					
Plasterer			\$ 10.31	\$ 10.94	\$ none

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Anoka Carver Hennepin Isanti	McLeod Mille Lacs Scott Sherburne	Wright	Basic Wage Rate & Fringe Benefits Per Hour		
				Eff. 10/1/75	Eff.	Eff.
Other Building Work						
Special Trades						
<u>Classification</u>						
Plumbers				\$ 10.29	\$ none	\$ none

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Aitkin	Dakota	Lincoln	Pipestone	Todd
	Anoka	Goodhue	Martin	Ramsey	Wabasha
	Benton	Hennepin	McLeod	Rice	Wadena
	Big Stone	Hubbard	Meeker	Rock	Washington
	Brown	Isanti	Mille Lacs	Scott	Wright
	Carver	Jackson	Morrison	Sherburne	
	Chisago	Kanabec	Nicollet	Sibley	
	Crow Wing	LeSueur	Nobles	Stearns	

Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff.	Eff.	Eff.
10/1/75		

Classification

Roofers

\$ 10.11	\$ none	\$ none
<u>10.11</u>	<u>none</u>	<u>none</u>
<u>none</u>	<u>none</u>	<u>none</u>

Build-Up
 Composition
 Kettleman

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Anoka	Kanabec	Wright
	Carver	McLeod	
	Hennepin	Scott	
	Isanti	Sherburne (Southern part)	

Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff.	Eff.	Eff.
10/1/75	11/1/75	5/1/76

Classification

Sandblaster

\$ 9.65 \$ 10.30 \$ 10.82

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Carver Hennepin McLeod Mecker (Eastern part)	Scott Sibley Wright	Basic Wage Rate & Fringe Benefits Per Hour		
			Eff. 10/1/75	Eff.	Eff.
Other Building Work					
Special Trades					
<u>Classification</u>					
Sheetmetal Worker			\$ 11.19	\$ none	\$ none

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Anoka Dakota Hennepin	Ramsey Scott Washington	Basic Wage Rate & Fringe Benefits Per Hour		
			Eff. 10/1/75	Eff.	Eff.
Other Building Work					
Special Trades					
<u>Classification</u>					
Sprinklerfitter			\$ 10.11	\$ none	\$ none

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DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Atkin	Hubbard	Pipestone
	Anoka	Clear Lake	Ramsey
	Beaumont	Clayton	Red Lake
	Benson	Jackson	Rice
	Big Stone	Kimberly	Rock
	Blue Earth	Koochiching	Roseau
	Brown	Lake	St. Louis
	Carlton	Lake of the Woods	Scott
	Carver	LeSueur	Sherburne
	Chisago	Lincoln	Sibley
	Clearwater	Mahnomen	Stearns
	Cook	Martin	Steale
	Crow Wing	McLeod	Todd
	Dakota	Meeker	Traverse
	Dodge	Mill Lake	Wabasha
	Faribault	Morrison	Wadena
	Fillmore	Mower	Waseca
	Freeborn	Nicollet	Washington
	Goodhue	Nobles	Wilkin
	Grant	Olusted	Vinona
	Hennepin	Pine	Wright
	Houston		

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Itasca (Western part)	Itasca	Humboldt
	Itasca	Jackson	Itasca
	Isanti	Kimberly	Rice
	Jackson	Koochiching	Rock
	Beaumont	Lake of the Woods	Roseau
	Big Stone	LeSueur	St. Louis (North- ern part)
	Blue Earth	Lincoln	Scott
	Brown	Mahnomen	Sherburne
	Carver	Martin	Sibley
	Chisago	McLeod	Stearns
	Clearwater	Meeker	Steale
	Crow Wing	Mill Lake	Todd
	Dakota	Morrison	Traverse
	Faribault	Mower	Wabasha
	Fillmore	Nicollet	Wadena
	Freeborn	Grant	Waseca
	Goodhue	Hennepin	Washington
	Grant	Houston	Wilkin
	Hennepin	Hubbard	Vinona
	Houston		Wright
	Hubbard		

Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff. 10/1/75	Eff. 3/1/76	Eff. 5/1/76

Classification

Terrazzo Worker

\$ 9.91	\$ 10.11	\$ 10.81
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11/1/75

Terrazzo Worker Helper

8.89	9.09	9.79
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Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff. 10/1/75	Eff. 11/1/75	Eff. 5/1/76

Classification

Tile Setter/Layer

\$ 9.86	\$ 10.06	\$ 10.64
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SECTION 14701
MATERIALS DISTRIBUTION SYSTEM

PART 1- GENERAL

1.1 GENERAL REQUIREMENTS

- A. Include GENERAL CONDITIONS, and applicable parts of Division 1 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.2 SCOPE

- A. Provide all engineering, labor, materials, services, equipment, and transportation necessary to fabricate and install all materials transport system work as shown in the Drawings, as specified herein or both.
- B. See Drawings for locations and details.

1.3 RELATED WORK UNDER OTHER CONTRACTS

- A. Architectural enclosures for stations.
- B. Cutting, patching, and painting.
- C. Cutting and framing of openings.
- D. Access Panels of sizes and locations shown on Drawings.
- E. Local fused 208V. AC, 3-phase 60 cycle circuits within five (5) feet of all drive motors, transfer devices, and main supervisory panel.

1.4 GUARANTEE

- A. Attention is directed to provisions of the GENERAL CONDITIONS regarding guarantees and warranties for work under this Contract.
- B. Manufacturer shall furnish his standard guarantee for work under this Section. However, such guarantees shall be in addition to, and not in lieu of all other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

- C. Any part of the system which proves defective in workmanship or material within one year from the date of system's acceptance shall be repaired or replaced by the Contractor without charge.
- D. The responsibility for design, construction, installation, completion, and test of the system, and compliance with the full intent of the Specifications shall rest with the System Contractor. The System Contractor shall be responsible for the successful operation of the system following completion and acceptance.

1.5 SHOP DRAWINGS

- A. Prepare and submit Shop Drawings in accordance with the requirements of the GENERAL CONDITIONS and in the manner described therein. Indicate carriageway routing, right of way, details of station and shaft layouts, fire doors and dampers, and location of power supplies, remote annunciators, monitors, switches and supervisory panel(s).
- B. Shop Drawings and cuts shall indicate Specification Section and Paragraph requiring equipment submitted.

1.6 PERMITS, LAWS, ORDINANCES, AND CODES

- A. Obtain and pay for all permits, inspections, licenses, and certificates required for work under this Section.
- B. Comply with laws, ordinances, rules, and regulations of all local, State, and Federal authorities having jurisdiction, the rules and regulations of the National Board of Fire Underwriters and of the Public Utility companies serving the building.

1.7 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

- A. Instruct, to the Owner's satisfaction, such persons as the Owner designates, in the proper operation and maintenance of the system and its parts, in accordance with Special Requirements. Provide two (2) copies of operators instruction manuals per station.
- B. Furnish "Instruction and Maintenance Manual", in accordance with Special Requirements, including:
 - 1. Installation plans and Detailed Drawings, both Mechanical and Electrical, indicating as-built conditions, two (2) prints plus one (1) sepia copy.
 - 2. Complete operational and trouble shooting instructions, and preventative maintenance schedules for motors, switches and other assemblies.
 - 3. Detailed list of all component parts and recommended list of spare parts to be maintained by Owner. Include part number, nomenclature, source, current price and estimated delivery time for each part.

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UNIT B/C

- C. Provide prearranged maintenance training at manufacturer's facilities, without cost to Owner except for travel and living expenses, at time of system installation and at any time after system acceptance and operation.

PART 2 - EQUIPMENT AND CONTROLS

2.1 DESCRIPTION

- A. Materials transport shall be a horizontal and vertical conveying system consisting of a network of belt conveyers, lifts, and automatic transfer devices, as required, to automatically distribute independent transport units between stations.
- B. Transport units shall travel fully automatically from any station to any other station within the system without human assistance for routing, transfer, and traffic control.
- C. Transport units shall be provided with hinged cover, including latch and lock, and shall travel in an upright position within the system at all times.
- D. To dispatch a transport unit, the operator shall close the cover and select the proper destination number by adjusting one set of clearly marked indicators on the side of the transport unit.
- E. Pressing the station dispatch button after placing the transport unit into a correct position, shall cause the transport unit to depart from the station and enter a traffic controlled network of horizontal carriageways and vertical lifts, where it shall be automatically guided through transfer devices and spurs via the shortest planned route to its proper destination.
- F. No central dispatching point or intermediate destination shall be required. Each transport unit shall be provided with one fixed set of destination indicators clearly marked with a home station number to facilitate return of an empty car to the originating station. Home station indicators shall be adjustable only by authorized personnel.
- G. The control of moving transport units within the system is by direct low voltage electric probes located at strategic points throughout the system which read the station address code located on the side of transport units as they pass by. The low voltage signal obtained by the probes is transferred to switching devices which transfer traffic from one lane to another when required.

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UNIT B/C

- H. Destination indicators on the sides of the transport unit shall provide for selection of up to one hundred (100) destinations in order to provide for future expansion of the system.
- I. The transport unit and cover shall be formed from a durable polymeric material and shall be sterilizable by steam or gas.
- J. A volume sensing device shall prevent transport units with open covers from entering the main traffic loop.
- K. The transport unit shall be moved horizontally by a system of motorized belt conveyors (carriageways) and vertically by means of motorized reciprocating lifts or chain-driven multi-floor lifts.
- L. Carriageways and lift platforms shall be formed of U-shaped metal channels to prevent jamming or overturning of transport units during transit.
- M. Installation hardware and system components shall be designed to permit disassembly and reassembly for alterations or additions when required.
- N. Switches and reversing shunts that transfer the transport units from one carriageway to another shall provide smooth acceleration and deceleration so that transport units shall not be subject to shock, agitation, or excessive vibration.
- O. While similar in physical appearance, each transfer device shall be mechanically and electrically configured at time of installation to perform a specific function. Such configuration shall be capable of alteration at any time should future alterations or additions to the system be desired.
- P. Power supplies which convert building power to low voltage direct current shall be short circuit-proof and shall be placed in close proximity to the carriageway at location determined by system design. The system shall consume power only when transport units are moving within designated zones.
- Q. Supervisory panels shall be provided, as required by the system design, to monitor the operation of belts, transfer devices and power supplies, and to signal any malfunction which may occur within these system components.
- R. Output capacity of each station in the system shall provide for the dispatch of one transport unit every three (3) seconds, on a continuous basis.
- S. Transport units dispatched from a station shall automatically enter the main traffic carriageways in such controlled sequence that they will not affect the movement of existing traffic in the system.

2.2 SYSTEM CONFIGURATION AND STATIONS

- A. The system shall be designed to provide fully automatic distribution capability between all stations in the system , each of which shall be interconnected by an appropriate quantity of conveyors, lifts, and spurs, and shall be provided with the required total quantity of transport units.
- B. Manual redischatching of cars shall not be required at any point within the system nor shall it be necessary to route cars through a central dispatch or distribution unit. Transport units shall travel via the shortest route to programmed destinations.
- C. Transport units, which by reason of operator error may be programmed to a nonexistent station, shall automatically be routed to Station 8 (Medical Records) on Level 2.
- D. The types and locations of the stations concerned in this Specification shall be as indicated on the Station List which shall be attached to the Contract Documents. To conserve workspace, off main line storage and holding devices shall be provided as shown on the drawings. Future requirements for additional storage, dictated by peak loading, shall be easily added to the system, as required.
- E. Type "A" Stations shall be stations stacked vertically one over another on the respective floors served by a multi-floor vertical lift and contained within the same vertical shaft, with each station provided with transport unit receiving and dispatch capabilities. Stations shall be capable of receiving a minimum of three transport units at the stations.
- F. Type "B" Stations shall be single or remote stations served by a reciprocating lift which transfers transport units into or out of the station from the main horizontal traffic route located above the station, and provided with transport unit receiving and dispatch capabilities. Stations shall be capable of receiving a minimum of two transport units at the station.
- G. Type "C" Stations shall be single or remote stations served by a reciprocating lift which transfers transport units into or out of the station from main horizontal traffic route located below the station, and provided with transport unit receiving and dispatch capabilities. Stations shall be capable of receiving a minimum of two transport units at the station.
- H. When the receiving segment of a Type "B" and "C" Station is full, the station shall have the capability to receive and store a minimum of three incoming transport units off the main traffic route at the station ready to enter the station location automatically when it becomes available.
- I. When a station is at design capacity for transport unit storage, all additional incoming units shall be automatically recirculated within the system. Transport units shall make a maximum of two subsequent attempts to reach the indicated station and then shall be automatically routed to the designated reject station.

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UNIT B/C

- J. A continuous audible alarm shall indicate when a station reaches storage capacity and cannot receive additional transport units. Alarms shall be installed at each station and at the main supervisory panel, and shall be automatically silenced when a transport unit is removed from the receiving segment of the station.
- K. Remote annunciators providing audio and visual signals shall be installed as indicated on the drawings. Annunciators shall be connected to monitor devices at a station that shall automatically distinguish only transport units programmed to the remote location. System shall be capable of incorporating additional annunciators as required in the future. Annunciator signals shall be provided with manual on-off switches.

2.3 CARRIAGEWAY COMPONENTS

- A. Belt conveyors shall be powered by non-proprietary electric motors of sufficient horsepower to serve the system capacity. Motors shall be located at approximately every one hundred and fifty (150) feet intervals in the horizontal carriageways.
- B. Mounting and installation hardware, clamps, and transition sleeves shall be attractive in appearance for exposed installation, and shall permit assembly and disassembly to facilitate future alterations and additions to the system.
- C. The carriageway profile shall be flanged to prevent overturning of transport units during transit and at the receiving segments of stations. Profile shall be shaped to facilitate removal and replacement of transport units at stations.
- D. When making horizontal turns, transport units shall be guided by curved metal flanges, formed on a 24-inch inside radius, and be moved on the same belt as used in the horizontal carriageways without use of additional electric motors or need to power curves individually.
- E. Carriageways shall be supported at each eight (8) feet of linear length. Hanger rods shall be equipped with suitable shock and vibration absorbers. Carriageway modules shall be installed straight and plumb with the building and supported against excessive motion under peak load. Carriageways and supports shall be capable of supporting an applied load equal to 200 pounds per linear foot of the system pathway.
- F. The transport unit payload will be supported directly over the center line of the carriageway and shall travel in an upright position at all times.
- G. Curves and offsets on a dual (two-way) carriageway will accommodate the passing of transport units in opposing directions at the same time so as not to impose traffic constraints on the system.

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- H. Dispatch controls at individual stations shall be provided with a key cylinder lock to prevent dispatch of transport unit by unauthorized personnel after station is closed. Provide two (2) keys, each station keyed in common with cylinder locks in covers of transport units.
- I. Transport units shall be moved in horizontal sections by means of powered belt conveyors at speeds of approximately 100 to 200 feet per minute and in vertical sections by means of a chain driven lift assembly at a speed of approximately 60 feet per minute.

2.4 TRANSPORT UNITS

- A. The system shall be equipped with one hundred twenty (120) transport units as indicated on the Station List attached to the Contract Documents.
- B. The transport unit shall be fabricated of impact resistant polymeric material with reinforcements along the edges and at corners and shall be sterilizable by steam or gas. Color of container and cover except hardware shall be beige.
- C. Both sides of the transport unit shall include two (2) sliding positive positioning index indicators identified as 0 through 9, thereby providing the system with a total capacity of 100 destinations (10 indicator positions per row X 2 rows = $10^2 = 100$). Index indicators on one side of the transport unit shall be readily adjustable for selecting destination stations in the system and index indicators on the opposite side shall be fixed for returning transport units to the home station. Provide integral handles at both ends of transport unit.
- D. Index indicator positions not required for use in system operation shall be blocked to reduce programming error of setting indicators at non-existent stations.
- E. The transport unit shall be provided with an integral and nonremovable lid. The cover or lid sections shall be hinged to open a full 180-degrees and designed to be easily opened or closed with one hand. Container lid shall be fully gasketed to prevent spillage of liquid on the pathway during transit.
- F. The latching mechanism for the transport unit lids shall be equipped with a positive closure and the station shall be equipped with a clearance barrier or sensor which will prevent a transport unit with an improperly closed cover from entering the system.
- G. The transport cover shall be equipped with a key cylinder lock of tumbler design supplied with two keys. Keying shall be common for network.
- H. Unobstructed minimum inside dimensions of the transport unit shall be 14-1/2" deep X 6" wide X 18" long. In addition to the weight of transport unit, the system shall be capable of transporting a payload of 20 pounds per unit, properly spaced over unrestricted vertical and horizontal distances.

- I. The system shall be provided with twenty (20) removable and sterilizable inserts, transferrable from transport unit to transport unit, each equipped with folding handles. Inserts shall secure specimens and other containers or instruments during transit of the transport unit. The transport unit and insert design shall be approved by the Owner before production begins.
- J. All interior and exterior edges of the transport unit shall have coved corners with a minimum radius of 1/8". Material shall resist staining from blood and urine.

2.5 TRANSFER AND CROSSOVER SWITCHES

- A. Switch mechanisms shall be designed to transfer transport units from carriageway to carriageway within the system in accordance with the destination code, with a minimum of shock, noise, and vibration. Hanger rods supporting switches shall be equipped with suitable shock and vibration absorbers.
- B. Switch controls shall automatically start, stop, and space approaching transport units, thereby avoiding the possibility of collisions or unnecessary physical interaction between units. Spacing device shall provide smooth acceleration and deceleration so that contents of transport unit shall not be subject to shock, agitation, or excessive vibration.
- C. All components of switches, including logic circuits, relays, contacts, and motors shall be easily accessible to permit servicing or replacement under operating conditions, and new installation with minimum system downtime.
- D. The entire switch mechanism shall be replaceable by removal from the switch housing, to which the approaching and forwarding carriageways are attached. The electrical controls shall be remotely located.
- E. The switches shall operate on twenty-four volts, direct current (24 V DC) and shall contain all controls, sensing equipment, and logic-circuits in order to be universally adaptable to any of the various configurations required by system design and function.
- F. Modification from one configuration to another shall be made possible by means of uncomplicated jumper connections or minor mechanical rearrangement of electrical components.
- G. Crossover switches and reversing shunts shall permit transport units to transfer directly from an active loop to an adjacent active loop or carriageway within the system, and shall not necessarily be required to conform to the fore-mentioned universality concept. Crossover switches shall be constructed by utilizing components identical to transfer switches in order that spare parts and service requirements be minimized, and shall operate by relays and low voltage wiring activated by direct contact with address code tabs located on transport units. Crossover switches shall be provided as shown on all applicable Drawings.

2.6 MATERIALS AND CONSTRUCTION

- A. All components of the entire system shall be designed for a minimum of noise emission. Motors, switches, and assemblies requiring lubrication and service shall be installed in locations accessible for maintenance. Motors, switches, and belt-drive or take-up assemblies shall not be installed above examination, consultation, dictation, treatment, and office spaces.
- B. Individual power supplies, including drive motors and transformers, shall be provided at approximate one hundred-fifty foot (150') intervals along carriageway and at stations, or as required by traffic conditions and system configuration.
- C. The conveyor drive, lift drive, and transfer assembly drive motors shall be 208V, 3 phase, primary. The control system, switch units, and loading/unloading conveyor shall be 24 volt DC. All required motor control centers and all required transformer-rectifiers shall be furnished and installed by the Conveyor Contractor.
- D. All motors shall be equipped with a constantly operating overload device to cut off the power to the motor should the conveyor be subjected to undue strain through any cause. Each station/lift shall have a safety circuit which shall stop the lift if a container shifts from its normal position after the transfer has started.
- E. Should a short circuit of longer duration cause the supervisory controls to shut down certain power supplies, reactivation shall be capable of being accomplished at the supervisory panel.
- F. Power supplies shall be equipped with a key controlled manual override mechanism for shut down of individual supplies, or the manual override of a zone shutdown by the automatic supervisory controls, respectively.
- G. Only motors, chains, and sprockets shall require lubrication. Each idler roller assembly shall be equipped with dual sealed-for-life grease packed precision ball bearings requiring no lubrication. All glides shall be nylon requiring no lubrication. No portion of the system that comes in contact with the container shall require lubrication of any type.
- H. Conveyor Bed shall be a pan type "U" shaped metal channel. The continuous belt shall ride on the bottom of the "U". If the return belt is not used on an adjacent channel, it shall return under the "U" channel. The upper portion of the "U" channel shall have glides on the inside to guide and steady the container.
- I. Turns shall be constructed of upper and lower levels of belt driven rollers. The rollers on the two levels are staggered and the axis of each roller is set in line with the radius line. The inside radius of the turn shall be 2'-0". Sufficient rollers shall be provided so that the container rides on at least three rollers at all times. The frame holding the rollers shall contain glides the same as the straight sections to guide and steady the container.

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- J. Idler Rollers shall be provided at all belt directional changes to guide the belt. Bearings used in metal roller assemblies shall be properly protected against static electricity.
- K. Belts shall be high strength fabric of the latest type, reinforced as required for silent operation. Tools and adhesive required to repair or splice belts shall be furnished with system. Drive pulleys shall be coated with a high friction plastic surface. Each belt shall have an automatic take-up pulley assembly.
- L. Switches shall be deflector type operated by 24 volt DC control circuits. The switches shall be pre-wired to solid state-transistorized modular plug-in units.
- M. Inclines and Declines shall be constructed the same as horizontal sections except they shall be sufficiently powered by belts designed to prevent any container from sliding at more or less than the speed of the belt.
- N. Multi-Station Lift shall be a continuously operating chain lift. The lift shall allow complete recirculation at head and base sections. The lift shall transport the containers in a right-side up position at all times.
 - (1) Gear Motor powering the lift shall have an integral brake which is released when energized. The drive motor shall develop ample starting torque to accelerate and raise a maximum unbalanced live load within the normal starting period for the selected motor. The brake shall be of a size which will stop the fully loaded conveyor within 1-1/2" of conveyor travel after stop signal is received.
 - (2) Carrying Chain shall be a roller chain with the rated working strength equal to or greater than the maximum live load. The rated working strength is that load which may be applied intermittently for 10 million cycles or more without yielding.
 - (3) Intermediate Sections shall be equipped with guides or rails to guide the vertically moving containers. Sections to be supported laterally and vertically at each floor.
 - (4) Chain Take-up shall be provided at the bottom of the vertical conveyor. An automatic switch shall stop the conveyor if the take-up is extended to maximum travel.
 - (5) Loading and Unloading Platforms shall be level, free rolling conveyors with a sufficient number of drive wheels for the length specified. The drive wheels shall be powered by small 24 volt DC motors.
- O. Single Station Lift shall be a direct driven reciprocating lift with motorized carrying table. The lift shall transport the containers in a right-side up position at all times.
 - (1) Loading and Unloading Platforms shall be level, free rolling conveyors with a sufficient number of drive wheels for the length specified. The drive wheels shall be powered by small 24 volt DC motors.

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- U. Gear Motor powering the lift shall have an integral brake which is released when energized. The drive motor shall develop ample starting torque to accelerate and raise a maximum live load within the normal starting period for the selected motor. The brake shall be of size which will stop the fully loaded conveyor within 1-1/2" of conveyor travel after stop signal is received.
- V. Carrying device shall be a wide belt with the rated working strength equal to or greater than the maximum live load. The rated working strength is that load which may be applied intermittently for 10 million cycles or more without yielding.

2.7 SUPERVISORY FUNCTIONS AND CONTROLS

- A. The system shall be electrically configured into individually supervised and controlled zones, each of which shall be electrically supervised by a Main Supervisory Panel. The Main Supervisory Panel shall include a color-coded network display consisting of a single isometric representation of the system. The display shall depict components, including carriageway, spurs, stations, switches, power supply, monitors, and fire dampers, and all operational and functional aspects of system performance, including switch function, transport unit travel, power supply, operating voltage, station loading, and traffic throughout.
- B. In the event of a malfunction within a particular zone, all power supplies within

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
Laws 1973 - Chapter 724
10/1/75

Aitkin Anoka Beltrami Denton Big Stone Blue Earth Brown Carlton Carver Chisago Clearwater Cook Crow Wing Dakota Dodge Faribault Fillmore Freeborn Goodhue Grant Hennepin Houston	Hubbard Isanti Itasca Jackson Kanabec Koochiching Lake Lake of the Woods LeSueur Lincoln Mahnomen Martin McLeod Meekeer Mille Lacs Morrison Mower Nicollet Nobles Olmsted Pine	Pipestone Ramsey Red Lake Rice Rock Roseau St. Louis Scott Sherburne Sibley Stearns Steele Todd Traverse Wabasha Wadena Waseca Washington Wilkin Winona Wright
Other Building Work Special Trades		
<u>Classification</u> Glazier		
		Basic Wage Rate & Fringe Benefits Per Hour Eff. 10/1/75 Eff. 11/3/75 Eff. 5/1/76 \$ 9.76 \$ 9.86 \$ 10.36

C. (cont.)

Reciprocating Lifts:

The indication of a jam or broken lift belt, indication of malfunction of the loading/unloading device, and indication that the drive unit is overloaded shall all be monitored as one point.

Conveyor Belts:

Indication of a broken belt and indication that the drive unit is overloaded shall be monitored as one point. Each belt and drive unit combination shall have a monitoring point.

- D. The illuminated power supply light at the panel shall indicate which power supply or switch caused the failure. All other power supply light and switch indications shall not illuminate following zone or system shut down.
- E. In the event of switch failure, reset shall be automatic following correction of the failure. In the event of power supply failure, reset shall be performed manually at the Panel. Each power supply shall also be capable of being shut off and electrically isolated to facilitate testing and repair. Each power supply shall be capable of being placed back into operation independently by means of a key controlled switch incorporated into the unit.
- F. The numbered zone indicator light in the Main Supervisory Panel shall be illuminated white when the zone is in operating condition; red when the zone is shut down due to a failure within the zone; and shall not be illuminated when the zone is shut off subsequent to a failure in another zone. In the event of a general shut down due to zone failure, a separate and additional shut-down light shall also be illuminated.
- G. A zone shutdown shall be displayed on the Panel by illumination of the appropriate indicator light, accompanied by a continuous audible alarm. The alarm shall be manually silenced by means of a momentary switch on the face of the Panel. The zone light shall be illuminated until the affected zone power supply or switch is reset. The audible alarm shall automatically sound at each subsequent trouble condition.
- H. Following a zone shut down and activation of audio and visual alarms, the Panel shall be programmed to either take no further action or effect shut down of the entire system following a timed interval which shall be adjustable from one (1) second to fifteen (15) minutes.

DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Anoka	Mille Lacs
	Carver	Pine (Southern part)
	Chisago	Ramsey
	Dakota	Scott
	Hennepin	Sherburne
	Isanti	Sibley
	Kanabec	Washington
	McLeod	Wright

Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff.	Eff.	Eff.
10/1/75	10/15/75	5/1/76

Classification

Cement Mason	\$ 9.88	\$ 10.08	\$ 10.68
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DEPARTMENT OF LABOR AND INDUSTRY WAGE RATE DETERMINATION
 Laws 1973 - Chapter 724
 10/1/75

County	Anoka (Western Part)	Mahnomen
	Benton	Martin
	Big Stone	McLeod
	Blue Earth	Meeker
	Brown	Nicollet
	Carver	Scott
	Faribault	Sherburne (Western part)
	Hennepin	Sibley
	Jackson	Stearns
	LeSueur (Western part)	Waseca
	Lincoln	Wright

Other Building Work

Special Trades

Basic Wage Rate & Fringe
Benefits Per Hour

Eff.	Eff.	Eff.
10/1/75		

Classification

Electrician	\$ 10.56	\$ none	\$ none
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- I. Reactivation of the system shall be automatic upon correction of a malfunction or by a manual reset button on the face of the Panel. Either of the two reactivation possibilities shall be determined by maintenance personnel and preprogrammed by means of a jumper connection.
- J. The automatic shut down shall affect only the carriageway power supplied. Switch power supplies, for logic and switching circuits, shall not be affected. The safety feature shall be provided in order to avoid a secondary failure during a shut down condition.
- K. The functions of system start up and shut down shall occur at the discretion of authorized personnel. System shall be capable of either total shut down or selective zone(s) shut down as initiated by controls at the Panel. Test switch shall be provided to verify operation of the monitoring indicators.
- L. The Supervisory Panel shall be equipped with an amber light for each station and a continuous audible alarm which shall be activated when a system is overloaded and indicate that it cannot receive additional transport units. Removal or dispatch of one transport unit at the station shall reset the alarm.
- M. A system purge control shall be provided at the Supervisory Panel, which shall clear all moving transport units from the system at the designated reject station.
- N. Supervisory Panel shall be designed to accommodate additional stations, as required in the future.

2.8 ELECTRICAL

- A. The System Contractor shall provide and install all low voltage 24 volt DC wiring, control wiring, and connections necessary for the proper operation and supervision of the entire system.
- B. The System Contractor shall be responsible for all component wiring between the local 208 V AC supply and all system equipment as required.

2.9 STATION DIRECTORIES

- A. Each station in the system shall be provided with a Station Directory, supplied and installed in a location approved by the Owner and Architect.
- B. Each directory shall clearly indicate the name, location, and destination code number of each station in the system. The station names shall be as furnished to the System Contractor by the Owner or the Architect.
- C. Directories shall also contain operational instructions for personnel using the system. Each directory shall be mounted in a chrome plated frame with a glass face.

2.10 FIRE DOORS AND AIR BAFFLES

- A. Fire Door shall be 2-hour UL Class "B" accordian type consisting of a pre-fabricated UL labeled panel mounted within a 10-gauge painted 3 x 3 steel angle frame. The panel shall be held in position by a latch arm assembly in conjunction with a standard 160° F., UL rated fuse link. The latch arm assembly shall support two-third (2/3) of the total weight of the labeled panel to insure against faulty release of the fuse link. To insure level closing of the panel and to avoid weight drop damage, sill sections of fire door frame assemblies shall be fitted with leveling shims adjusted at time of installation. Doors shall be as manufactured by American Warming and Ventilating Company of Toledo, Ohio, or approved equal, and shall be specifically designed to accommodate standard carriageway sections while maintaining UL rating. Motorized fire door assemblies shall be provided at station enclosures as required.
- B. Fire damper assemblies shall be provided for other wall openings as shown on the Drawings. The System Contractor shall provide and install all fire doors and dampers as required.
- C. Air Baffles shall be of satin-finish, 16 gauge, type 302 stainless steel with one-piece neoprene flap pivot mounted into frame and extending into track. Baffle shall be fastened directly to the surface in which the fire door is located and shall be designed to operate under internal air system pressures of up to 1/2" column of water. Flap shall be operated by the action of a passing transport unit and shall return to its original closed position after the transport unit has passed through the opening. The system Contractor shall provide and install all air baffles as required to maintain balance of building ventilation and air conditioning systems.

PART 3 - TESTING AND MAINTENANCE

3.1 SYSTEM TESTING

- A. Upon completion of the installation, the System Contractor, in company with the Owner and/or his representative, shall conduct such examination of the materials and workmanship as required to establish that all work has been accomplished according to the full intent of the contract award.
- B. Performance and capability tests shall be designed and carried out jointly by the System Contractor and the Owner.

3.2 INITIAL MAINTENANCE

- A. Maintenance of the equipment shall be furnished for a continuous period of 12 months after completion and acceptance of the work without additional cost to the Owner for labor or travel expenses of service personnel.

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- B. The Contract Price shall be adjusted yearly as soon as practicable after the index of "Wholesale Commodity Prices for Metals and Metal Products" has been published for the anniversary month of the Contract.
- C. Each such adjustment shall be made as follows:
 - 1. The material cost of the contract price shall be increased or decreased by the percentage of change shown by the index of "Wholesale Commodity Prices for Metals and Metal Products" published by the U.S. Department of Labor, Bureau of Statistics, for the month within which falls the anniversary of the commencement of the 5-year contract.
 - 2. The labor cost of the contract price shall be increased or decreased by the percentage of change in the straight time hourly labor cost for the month within which falls the anniversary of the commencement of the service as compared with such straight-time hourly labor cost on the commencement of the 5-year contract.
 - 3. The Owner shall have the option of canceling the contract at any time by giving the Contractor 30 days' notice.

3.4 MANUFACTURER AND SYSTEM

- A. Automated materials transport system shall be "Distributor" as manufactured by W.B. McGuire Engineering Co. Ltd, Montreal, Quebec, Canada.
- B. System shall have been tested and approved by Underwriters' Laboratories, Inc.
- C. System mechanical and electrical parts and components shall be non-proprietary to facilitate local procurement for replacement.
- D. Within the system, the minimum time requirement for one-way carrier travel between any two stations in Unit B/C shall be 10 minutes, and the minimum time for one-way carrier travel between any station in Unit B/C and Mayo Station(s) shall be 15 minutes.

BID FORM - FOR LUMP SUM CONTRACTS
(Combined Form for all Contract Divisions)

TO THE: REGENTS OF THE
UNIVERSITY OF MINNESOTA
MINNEAPOLIS, MINNESOTA

PROPOSAL FOR MATERIALS TRANSPORT SYSTEM
(contract division)

ATTENTION: ROBERT JAMES
DIRECTOR OF PURCHASING
(PURCHASING AGENT)
2610 UNIVERSITY AVENUE
ST. PAUL, MINNESOTA 55114

PROJECT: UNIT B/C OF THE
HEALTH SCIENCES EXPANSION

LOCATION: MINNEAPOLIS, MINNESOTA

DATE: _____

-
- (1) Bid of _____
(Firm name - hereinafter referred to as the "Bidder")
- (2) The Bidder, in compliance with Advertisement for Bids, hereby submits the following Bid for the MATERIALS TRANSPORT SYSTEM in connection with Unit B/C, Health Sciences Expansion, Minneapolis, Minnesota, Project Number MINN. 18 (HP).
- (3) The Bidder agrees to accomplish the Work in strict compliance with the drawings, specifications and Contract Documents, dated 20 October 1976, prepared by The Architects Collaborative, Inc., and Health Sciences Architects and Engineers, Inc., and as stated in the attached letter dated _____.
- (4) The Bidder, having examined the drawings, specifications and related documents, visited and examined the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed Project including the availability of materials and labor, hereby proposes to furnish all labor, materials, services, and supplies, and to accomplish the Work for which this Bid is submitted, in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this Bid is a part.
- (5) Addenda: The Bidder hereby acknowledges that Addendum instructions numbered _____ have been received and the requirements therein have been incorporated in this Bid.
- (6) Completion of Work: The Bidder hereby agrees to commence work under this Contract on or before the time stipulated in the written "Notice to Proceed" in accordance with the General Conditions, and to complete all Work under this Contract on or before the dates specified in Specification Section 01200 and other provisions of the Contract Documents.
- (7) In completing this Bid, the Bidder shall complete the Bid in both words and figures. Should any Alternate Proposal result in no difference in cost, the Bidder shall write "NO CHANGE" for the Alternate. The Bidder shall submit a bid or "No Change" for each Alternate listed under his Contract Division. Refer to Section 01100 - Alternates.

(8) MATERIALS TRANSPORT SYSTEM BID (MTS)

BASE BID MTS: Bidder agrees to perform all of the Materials Transport System Construction Work for the sum of _____

_____ \$ _____

ALTERNATE MTS-1: Omit Station 17 (Dental), Floor 7, Unit B/C

DEDUCT _____ \$ _____

ALTERNATE MTS-2: Omit Station 16 (Psychiatry), Floor 6, Unit B/C

DEDUCT _____ \$ _____

ALTERNATE MTS-3: Omit Station 15 (Neurology), Floor 5, Unit B/C

DEDUCT _____ \$ _____

ALTERNATE MTS-4: Omit Station 7 (Ambulatory Surgery), Floor 1, Unit B/C

DEDUCT _____ \$ _____

ALTERNATE MTS-5: Omit Station 10 (Business Office/Admissions), Floor 2, Unit B/C DEDUCT _____

_____ \$ _____

ALTERNATE MTS-6: Omit Station 20 (Mayo 1), Floor 1, Mayo Hospital)

DEDUCT _____ \$ _____

ALTERNATE MTS-7: Omit Station 21 (Mayo 2), Floor 2, Mayo Hospital, including all track, switches, hardware and monitoring connecting to main line pathway in Unit B/C. DEDUCT _____

_____ \$ _____

- (9) Unit Prices: Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those on which the Bid is based, by order or approval of the Architect/Engineer, the undersigned agrees that the following supplemental Unit Prices will be the basis of payment to him or credit to the Owner for such addition, increase or decrease in the work. Unit Prices given shall represent the exact net amount per unit to be paid the Contractor (in the case of additions or increases) or to be the basis for refund to the Owner (in the case of decreases). The Unit Prices shall include associated supervisory monitoring and installation. No additional adjustment will be allowed for overhead, profit, insurance, compensation insurance or other direct or indirect expenses. The Owner shall have the right to reject any or all proposed Unit Prices at any time prior to signing the Agreement, in which case the cost of extra work shall be as determined by one of the other methods set forth for changes in the work, in the General Conditions. Unit Prices given herein shall be for additional work only. Decreased work at Unit Prices shall be at the "Add" price less fifteen percent (15%).

As per Section 14701: Complete the line items under this Section or Section 14700, as applicable:

- (a) Dual Carriageway Components, including hangers, anchors, clamps, splices, slider beds, belting and guard rails, per assembly.

Channel, Horizontal, 8' Module	\$ _____
Horizontal Offset, 20 Degrees	\$ _____
Horizontal Offset, 45 Degrees	\$ _____
Horizontal Offset, 90 Degrees	\$ _____
Vertical Offset, 0-20 Degrees	\$ _____
Belt Divider	\$ _____
End Pulley Assembly	\$ _____
Drive Unit, including Starter	\$ _____

- (b) Station Components, including carriageway, supports, controls and directory, per assembly:

End Station Assembly, 3 Transport Units	\$ _____
On-Line Station Assembly, 3 Transport Units	\$ _____
Transfer Station Sssembly, 3 Transport Units	\$ _____
Multifloor Station Assembly, 3 Transport Units	\$ _____

- (c) Switching Units (not included with Station Components above), including control, read heads, supports and hardware, per each unit:

Switch, Entry	\$ _____
Switch, Exit	\$ _____
Switch, Reversing	\$ _____

- (d) Transport Units, complete with hinged cover assembly, keylock and escort memory code devices per unit:

Transport Unit:	\$ _____
-----------------	----------

- (e) Transport Unit Inserts, including hardware, per each unit:

Removable Insert (with handle)	\$ _____
--------------------------------	----------

- (f) Fire Dampers and Motorized Fire Doors, including releasing mechanism and actuating device, per each assembly:

Fire Damper Assembly, Class A (Dual Carriageway)	\$ _____
Fire Damper Assembly, Class B (Dual Carriageway)	\$ _____

As per Section 14700: Complete the line items under this Section or Section 14701, as applicable:

(a) Track Components, including hangers, anchors, isolators, clamps, splices, struts, power and logic rails, gear, racks and fasteners, per each track length:

Straight Track, Horizontal, 10' Length \$ _____
Straight Track, Vertical, 10' Length \$ _____

Outside Bend, 90 Degrees, 27" Radius \$ _____
Inside Bend, 90 Degrees, 27" Radius \$ _____
Outside Bend, 45 Degrees, 27" Radius \$ _____
Inside Bend, 45 Degrees, 27" Radius \$ _____
Vertical Offset, 22-1/2 Degree Bends \$ _____

Curve, 90 Degrees, 34" Radius \$ _____
Curve, 45 Degrees, 34" Radius \$ _____
Curve, 22-1/2 Degrees, 34" Radius \$ _____
Horizontal Offset, 22-1/2 Degree Curves \$ _____

Curve, 90 Degrees, 24" Radius \$ _____
Curve, 45 Degrees, 24" Radius \$ _____
Curve, 22-1/2 Degrees, 24" Radius \$ _____
Horizontal Offset, 22-1/2 Degree Curves, 6-1/4" Filler \$ _____

(b) Station components, including appropriate 5'-0" length(s) of straight track, supports, controls and directory, per assembly:

Re-Entry Station Assembly, 3 Car \$ _____
Exit/Entry Station Assembly, 3 Car \$ _____
Transfer Station Assembly, 7 Car \$ _____

(c) Switching units, including controls, read plates, supports and hardware, per each unit:

Switch, Re-Entry \$ _____
Switch, Exit/Entry \$ _____
Switch, Transfer \$ _____
Switch, Single \$ _____

(d) Delivery vehicles, including container with hinged cover assembly, keylock, electrical latch interlock, touch stop control, motor, chassis, and thermal overload device, per car:

Car, 20-lb. Capacity Container \$ _____
Car, Vacuum, 20-lb. Capacity Container \$ _____

(e) Delivery vehicle inserts, including hardware, per each unit:

Removable Gimbal Device (2 Basket Capacity) \$ _____
Wire Basket (With Handle) \$ _____

(f) Power monitors, including mounting brackets and electrical connections, per each module:

Multi-Power Module, 100 Amp \$ _____
Uni-Power Module, 25 Amp \$ _____

(9) Fire dampers, including release mechanisms and actuating devices, and air baffles, per each assembly:

Fire Damper Assembly, Class A (Single Track)	\$ _____
Fire Damper Assembly, Class A (Double Track)	\$ _____
Fire Damper Assembly, Vertical, Class B (Single Track)	\$ _____
Fire Damper Assembly, Vertical, Class B (Double Track)	\$ _____
Fire Damper Assembly, Horizontal, Class B (Single Track)	\$ _____
Fire Damper Assembly, Horizontal, Class B (Double Track)	\$ _____
Air Baffle Assembly, Single Track	\$ _____
Air Baffle Assembly, Double Track	\$ _____

(10) Bid Security: The Bidder submits the attached Bid Security in the form of a Certified Check, Cashier's Check or Bid Bond, in accordance with the Instructions To Bidders, drawn to the order of the Regents of the University of Minnesota. The Bidder acknowledges the Bid Security may be retained by the University as specified in the Instructions To Bidders and agrees if the Bidder defaults in executing the Contract within the time set forth, or in furnishing the Performance Bond as specified, the check will become the property of the University (or the Surety will pay the University in the amount of the bond) as liquidated damages for the delay and additional expense to the Owner caused thereby.

(11) Holding of Bids: The Bidder agrees this Bid shall be good and may not be withdrawn for forty five (45) calendar days after the scheduled time and date for receiving bids, except that Alternate Bids shall be good and the work omitted by any accepted alternate may be ordered reinstated by the University at any time up to one hundred twenty (120) calendar days after the scheduled time and date for receipt of bids.

(12) Acceptance of Bids: The Bidder understands the University reserves the right to accept any Bid it determines in its best interest, to accept Alternates as stated in the Instructions To Bidders, and to reject any and all Bids. Upon receipt of notice of award of a Contract (acceptance of this Bid) the Bidder will execute the Agreement, in the specified form, within 10 regular work days thereafter and to deliver a Contractor's Performance Bond, in the stipulated Form, in accordance with Article 8 of the Instructions To Bidders and Paragraph 7.5 of the General Conditions.

(13) Informalities: It is understood by the Bidder the University reserves the right to waive informalities in bids received and minor discrepancies in bidding procedure.

(14) Information about Bidder:

If a Corporation, incorporated in the State of _____

Qualified to conduct business in the State of Minnesota? _____

If a Partnership, full names of all Partners are _____

(15) Schedule:

Engineering prerequisite to beginning of installation can be complete on:
_____.

Shop Drawings can be complete and ready for submittal on:
_____.

Delivery of materials to the field for installation can begin on:
_____.

Installation in the field can begin on:
_____.

(16) Certification for Equal Opportunity
and Affirmative Action:

(Must Be Signed By Bidder)

The bidder hereby certifies that all of the specified requirements for
Equal Opportunity and Affirmative Action, General Conditions, Article 15,
will be fully complied with, as stated, for this Project.

(Signed) _____, Title

(17) Respectfully submitted:

Correct and full name of Bidder

Name _____

Address _____

By _____ Title _____

By _____ Title _____

(Affix Corporate Seal if bid is by a corporation)

Date _____

ADDENDUM NO. 2

10 November 1976

Second Addendum to conditions, specifications, related documents, and drawings entitled:

UNIT B/C OF THE
UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION
PROJECT NO. MINN. 18 (HP)
MATERIALS TRANSPORT SYSTEM

THE ARCHITECTS COLLABORATIVE Inc. Cambridge, Massachusetts

HEALTH SCIENCES ARCHITECTS AND ENGINEERS, INC.
2829 University Avenue, Minneapolis, Minnesota 55414

The additions, revisions, omissions, corrections and clarifications contained herein shall be made to the Drawings and Specifications for the project and shall be included in scope of work and in the bids to be submitted. All bids and the construction documents shall be based on these modifications.

Each Bidder shall notify such sub-bidders as may be affected by this Addendum.

REVISIONS:

- Item 1: Addendum No. 1, Page 2, Item 9: Change the phrases "minimum time" to read "maximum time".
- Item 2: Addendum No. 1, Page 14701-15, Paragraph 3.4, Subparagraph D: Change the phrases "minimum time" to read "maximum time".
- Item 3: Drawing MTS 1: Change the word "Panel" at note which locates Room C112 in Mayo Hospital to read "Test Station as required".
- Item 4: Drawing MTS 1: Add the following notes:
- " 11. Supervisory Panel for system shall be located at Station 8 (Medical Records) on Level 2 in Unit B/C.
 - 12. The remote annunciator listed for Bio-Medical Graphics (Room 127) and connected to Station 3 (Word Processing) shall be located on the Basement Floor between column grids S37 - S38 and E4-E5.

13. The remote annunciator listed for Outpatient Administration and connected to Station 10 (Business Office) shall be located on Floor 2 between column grids S33-S34 and E12-E13.
14. The remote annunciator listed for Pharmacy (Room 147) and connected to Station 11 (Pharmacy/T&D Dispensing) shall be located on Floor 2 between column grids S37-S39 and E6-E7.
15. The remote annunciator listed for T&D Dispensing and connected to Station 11 (Pharmacy/T&D Dispensing) shall be located on Floor 2 between column grids S40-S41 and E4-E6 ."

Item 5: Drawing MTS-4: Detail 9, Plan - Station 20

Add one (1) fire damper, class B, at each opening above the ceiling required for the pathway in walls east and west of the elevator lobby on Floor 1, Mayo Hospital, at column grids "P" and "R".

TAC

THE ARCHITECTS COLLABORATIVE INC.

JEAN B. FLETCHER
1945 1965
WALTER GROPIUS
1945 1969
NORMAN FLETCHER
JOHN C. HARKNESS
SARAH P. HARKNESS
LOUIS A. McMILLEN

RICHARD BROOKER
ALEX CVIJANOVIĆ
HERBERT GALLAGHER
WILLIAM J. GEDDIS
ROLAND KLUVER
PETER W. MORTON
H. MORSE PAYNE
ERNEST L. BIRDSALL
TREASURER

HOWARD ELKUS
ALLISON GOODWIN
BASIL HASSAN
JOHN HAYES
JOSEPH HOSKINS
LEONARD NOTKIN
RICHARD SABIN
DAVID SHEFFIELD

QAZI B. AHMED
ROBERT BARNES
KENDALL P. BATES
SERGE CVIJANOVIĆ
ROYSTON DALEY
ROBERT DEWOLFE
GREGORY DOWNES
GAIL FLYNN
GERALD FOSTER
THOMAS LARSON
RALPH MONTGOMERY
PERRY NEUBAUER
IGOR G. PLATOUNOFF
RICHARD PUFFER
WALTER ROSENFELD
JOHN J. SCOTT
EDMUND SUMMERSBY
KENNETH TAYLOR
MALCOLM TICKNOR
ROBERT TURNER
ROBERT WILSON
LAURENCE ZUELKE

RECEIVED

MAY 10 1977

UNIV. OF MINN.
HEALTH SCIENCE
PLANNING OFFICE

5 May 77

Mr. Robert M. Dickler
Associate Director, University Hospitals
Box 606, Mayo Memorial Building
University of Minnesota
Minneapolis, MN 55455

Re: Unit B/C Materials Transport System (MTS), TAC Job 75046

Dear Bob:

As requested earlier, I have enclosed for your records the copies of correspondence, documents, meeting notes, and summaries from the period of October to December 1976, which regard the pre-bid and final selection process for procurement of the materials transport system for Unit B/C.

The summaries of criteria and estimated project cost figures which became the basis for final system selection are included with notes of the meeting on 18 November 1976.

If you feel that any of the material requires further clarification, please contact me.

Very truly yours,

THE ARCHITECTS COLLABORATIVE, Inc.

Herman B. Zinter

cc: P. Maupin
HSAE
N. Omundson

Encl.
HBZ:ld

THE UNIVERSITY OF MINNESOTA HOSPITALS
Minneapolis, Minnesota

Unit B/C Non-Scheduled Materials Transport System
Part 4: Summary of Final Bid Proposals (November 1976)

DISTRIBUTOR SYSTEM (Ada-Bec)
J.E. Coleman/Farbman, a Joint Venture

TELELIFT SYSTEM
Mosler Airmatic and Electronic Systems Division

Evaluation of bids and final system selection

The Architects Collaborative, Inc.
Cambridge, Massachusetts

Health Sciences Architects and Engineers, Inc.
Minneapolis, Minnesota

PHONE: (514) 931-7527
 TELEX: 05-24734

McGUIRE

W. B. McGUIRE ENGINEERING CO. LTD.

1301 MONTMORENCY ST., MONTREAL, QUE. H3K 2G4



MANUFACTURERS OF: PNEUMATIC TUBE SYSTEMS - RUBBER DOORS, TRANSPARENT AND COLOURED SWINGING DOOR
 LOADING DOCK COVERS, FOAM SEAL PADS, DOCK BUMPERS AND DOCK LIGHTS
 MATERIALS HANDLING EQUIPMENT, TOOL KITS, ETC.

September 15, 1976.

University of Minnesota
 412 Union St S.E.
 Minneapolis, Minnesota

Attention: Mr Robert Dickler - Assoc. Director
Ref.: U. of M. unit B/C Non Scheduled Materials Transport
 System. Quotation based on Drawing B/C Sheet No M-48.

U. OF MINN.		
DATE:	10/21/76	
COPY	ATTN:	INIT.
JCH		
RK		
RT		
KT		
JS	X	
DM		
RB		
JG		
KS		
RG		
KR		
HL	X	
FILE	2371	

Dear Mr Dickler,

Following your conversation with our Marcel Langlois we are pleased to quote on your requirements as follows.

To supply materials (duty paid F.O.B. Jobsite), complete engineering, one full time supervisor and technical assistance for the sum of
 ...U.S.\$326.840.00.

McGuire guarantees to replace free of charge any component which fails within one year of completion.

The University of Minnesota will pay for installation labor.

Due to the work done on Hennepin and Associated Hospitals we can supply information on union labor experienced on our systems. We also have available two excellent supervisors one of which will be chosen to control your installation. Upon completion we will supply maintenance manuals, in place drawings and operating instruction booklets.

We are also enclosing our latest balance sheet and we are taking this opportunity to give you some information on our company.

"McGuire" has been in business since 1955 and has operations in Canada and the U.S. The Adabec Systems were originally part of the "McGuire" product line but was "spun off" in 1972 to Marcel Langlois who formed Adabec Systems Ltd. Unfortunately, insufficient finances forced the discontinuation of the company and "McGuire" has purchased all the assets including the building, machinery, jigs, dies, plans and has retained the basic employees. Over the past few years the system has been modified and refined and you, the customer, will benefit from a completely updated conveyor system which will give you years of satisfaction.

PHONE: (514) 931-7527
TELEX: 05-24734

McGUIRE

W. B. McGUIRE ENGINEERING CO. LTD.

1301 MONTMORENCY ST., MONTREAL, QUE. H3K 2G4



MANUFACTURERS OF: PNEUMATIC TUBE SYSTEMS - RUBBER DOORS, TRANSPARENT AND COLOURED SWINGING DOOR
LOADING DOCK COVERS, FOAM SEAL PADS, DOCK BUMPERS AND DOCK LIGHTS
MATERIALS HANDLING EQUIPMENT, TOOL KITS, ETC.
September 15, 1976.

McGuire intends to continue the production and sale of "Adabec Systems" in the future so that we will always be available for repair or extension if necessary and to honor our one (1) year guarantee of all components except for ordinary wear,

McGuire will also guarantee the systems operating to your complete satisfaction provided our supervisor is used and allowed to exercise control over labor.

We expect that the owners will have a savings of \$90,000.00 to \$100,000.00 over the price we would have to quote to supply and install. The "McGuire" companies in Canada and the U.S. have an excellent reputation and we can assure you of complete satisfaction.

We trust we may be favored with your valued order.

Yours Very Truly,

W.B. McGUIRE ENGINEERING CO. LTD

Morris Lobel,
President.

MILLER, GOLDENBERG, HEFT & CO.
CHARTERED ACCOUNTANTS

MAURICE A. MILLER, C.A.
MICHAEL GOLDENBERG, C.A.
EDWARD HEFT, C.A.

CHATEAU MAISONNEUVE
4999 ST. CATHERINE ST. WEST
MONTREAL, QUEBEC

To the Shareholders of
W.B. MCGUIRE ENGINEERING CO. LTD.
W.B. MCGUIRE CO. INC.
Montreal, Quebec

ACCOUNTANTS' COMMENTS

The accompanying Consolidated Balance Sheet as at December 31, 1975 has been prepared on the basis of the Financial Statements prepared by other auditors. We offer no opinion on the Consolidated Balance Sheet as at December 31, 1975.

Miller, Goldenberg, Heft & Co.
.....
Chartered Accountants

Montreal,
June 10, 1976.

W.B. MCGUIRE ENGINEERING CO. LTD.

W.B. MCGUIRE CO. INC.

CONSOLIDATED BALANCE SHEET

AS AT DECEMBER 31, 1975

(With Comparative Figures for the Preceding Year)

	<u>1975</u>	<u>1974</u>
<u>A S S E T S</u>	<u>\$</u>	<u>\$</u>
<u>Current</u>		
Accounts receivable, less allowance for doubtful accounts	1,402,324	1,077,172
Loans receivable - shareholders	26,790	25,890
Advance commissions	21,238	-
Prepaid expenses	45,313	29,646
Inventories	1,060,814	755,448
	<u>2,556,479</u>	<u>1,888,156</u>
<u>Non-Current</u>		
Note receivable - 9% due July 1976	49,900	49,900
Note receivable - 6% due March 1, 1980	20,000	-
	<u>69,900</u>	<u>49,900</u>
<u>Fixed</u>		
Property, plant and equipment, at cost, less accumulated depreciation	348,929	300,380
<u>Other Assets</u>		
	10,972	13,188
	<u>2,986,280</u>	<u>2,251,624</u>
<u>L I A B I L I T I E S</u>		
<u>Current</u>		
Bank indebtedness	230,584	34,001
Notes payable	300,000	240,588
Accounts payable and sundry current liabilities	598,593	607,233
Income taxes payable	232,015	117,259
Notes and mortgages payable - current portion	24,005	18,696
	<u>1,385,197</u>	<u>1,017,777</u>
<u>Long-Term</u>		
Notes and mortgages payable	323,844	324,192
	<u>1,709,041</u>	<u>1,341,969</u>
<u>S H A R E H O L D E R S ' E Q U I T Y</u>		
<u>Capital Stock</u>	33,800	18,000
<u>Retained Earnings</u>	1,243,439	891,655
	<u>1,277,239</u>	<u>909,655</u>
	<u>2,986,280</u>	<u>2,251,624</u>

Note 1: No adjustment has been made for foreign exchange.

Note 2: Please refer to our Accountants' Comments accompanying

J. E. COLEMAN CO.

342 MADISON AVENUE • NEW YORK, N.Y. 10017 • TEL. 212 MU7-2134

materials handling equipment
processing equipment
conveying systems

October 25, 1976

University of Minnesota
412 Union Street, S.E.
Minneapolis, MN

Attn: Mr. Robert Dickler
Associate Director

Gentlemen:

We are pleased to enclose our proposal on a Pathfinder Demand Delivery System for your new facility. In this case, the Pathfinder System will incorporate the Ada-Bec design which will be supplied by W. B. McGuire Engineering Co. Ltd. of Montreal.

We wish to assure you that we intend to supply you with a first class system in all respects. Further, the W. B. McGuire Co. equipment is fully compatible with our Pathfinder System's approach, and we are presently installing a system of this type at the Carle Foundation Clinic in Urbana, Illinois. We would be happy to have you and your representatives visit this site for an inspection if you wish.

We thank you for the opportunity of submitting this quotation and trust that we will be favored with your valued order.

Very truly yours,

J. E. COLEMAN CO.

Joseph E. Coleman
Joseph E. Coleman

JEC:st
Encs.

DATE: 11/1/76															
COPY		ATTN:		INT.											
JCH	JAK	INT	KT	ES	DP	CS	LS	AS	RS	MS	ES	MS	ES	MS	ES
				X						X					

*LTRY + PRICES SCALED. ANDY

File 0371

J. E. COLEMAN CO.

342 MADISON AVENUE • NEW YORK, N.Y. 10017 • TEL. 212 MUT-2154

materials handling equipment
 processing equipment
 conveying systems

PROPOSAL No. 10761

TO: University of Minnesota
 412 Union Street, S.E.
 Minneapolis, MN

DATE: October 25, 1976

TERMS: 5% with contract, Monthly Contract
 Billing against Material and Labor
 F.O.B. Shipping Points, Freight Allowed

ATT: Mr. Robert Dickler, Assoc. Director

SHIPMENT: Job Completion by Oct. 1977 based
 on appropriate construction
 schedule

REFER TO YOUR INQUIRY Non-Scheduled Material
 Transportation System

NOTE: PRICES DO NOT INCLUDE ANY FEDERAL, STATE
 OR LOCAL TAXES UNLESS OTHERWISE STATED.

ITEM	QUANTITY	DESCRIPTION AND SPECIFICATIONS	PRICE
		<p>We propose to furnish and install one complete non-scheduled material transportation system (Demand Delivery System) in accordance with the following documents enclosed and made part of this proposal:</p> <ul style="list-style-type: none"> A. Drawings, Number M-48-106 DOS and Number M-50-106 DDS B. 9 Pages of Specifications C. 3 Typical Station Drawings D. Terms and Conditions of Sale <p>Total Price ----- \$ 507,840.00</p> <p>Price includes cost of bond.</p>	
SUBJECT TO OUR ATTACHED GENERAL CONDITIONS OF SALE.			

J. E. COLEMAN CO.

ACCEPTED _____

PURCHASER

BY _____

DATE _____

Joseph E. Coleman

 Joseph E. Coleman

THE ARCHITECTS COLLABORATIVE Inc.
 HEALTH SCIENCES ARCHITECTS AND ENGINEERS, INC.

UNIVERSITY OF MINNESOTA
 HEALTH SCIENCES EXPANSION

MEETING NOTES

DATE: 27 October 1976

TAC JOB: 75046, Unit B/C Materials Transport System

SUBJECT: Pre-Bid Conference (Coleman)

PLACE: Room 4110, Powell Hall

NOTES BY: Herman Zinter

PRESENT: Arne Hilland, Jim Lehtinen (Coleman)
 Robert Dickler, Paul Maupin, Eugene Kogl, Robert James (U/Minn)
 John Scott, Herman Zinter (TAC/HSAE)

The purpose of the meeting was to consider a proposal to install a Materials Transport System in Unit B/C using ADA-BEC equipment and to discuss project conditions, including provisions of the contract documents. The following items were discussed:

ITEM ACTION REQUIRED

1. A proposal was submitted by A. Hilland, representing the J.E. Coleman Co. of New York, NY, to furnish and install (complete) a materials transport system in Unit B/C, using ADA-BEC controls and equipment. (Reference J.E. Coleman Co. proposal No. 10761, with attached drawings and specifications). The following items were included in the presentation:

- a) According to the proposal, equipment will be fabricated by W.B. McGuire Engineering Co. Ltd, Montreal, Canada, with site installation and supervision performed by Mr. James Lehtinen of R.O.I. Systems, Deerfield, Illinois. System design, engineering, and manufacturing coordination will be directed by Mr. Arne T. Hilland, of Hilland Associates Ltd, Manlius, New York.

U. OF MINN.	DATE	11/10/76											52774		
	INIT.														
	ATTN.														
	COPY			X							X				
	JCH	RK	RT	KT	JS	DM	RB	JG	KC	KG	TR				

ITEM

ACTION REQUIRED

- The System Contractor, employing millwrights, will be J.E. Coleman Co. A separate electrical sub-contractor will be used to install secondary power and control wiring and equipment.
- b) The J.E. Coleman Co. has specialized in materials handling for approximately 25 years, primarily in the contracting and distributing of bulk handling or conveyor equipment (manufactured by others). Recently, the company has acquired experience in demand delivery type systems, using equipment built by Sovex-Marshall in England, and marketed under the trade name of PATHFINDER. Projects include the furnishing of materials and installation for the LaGuardia (HIP) Hospital, Forest Hills, NY, which is under construction, and furnishing materials only for the Duke University Medical Center, Durham, N.C.
 - c) Bonding, according to project requirements, will be arranged through joint venture of the Gen co and J.E. Coleman Companies.
 - d) Projects now under construction in the Midwest region, using ADA-BEC equipment, include the following:
 - Hennepin County/Metropolitan Medical Center
 - St. Paul Ramsey Medical Center
 - Carle Foundation Clinic, Urbana, Illinois
 - e) After testing and acceptance, the system will be guaranteed by the J.E. Coleman Co. against faulty workmanship and materials for one year. After this period, maintenance, repair, or replacement of components would be arranged through Mr. Lehtinen and the J.E. Coleman Co., McGuire Engineering Co., or a local conveyor contractor, such as Acc-u-rectors of Mahtomedi, MN.

ITEM

ACTION REQUIRED

During the warranty period, or with subsequent maintenance contracts, it was indicated that response to service calls would be made within 24 hours.

- f) Most system parts are non-proprietary and can be locally procured, including a recently introduced type of belt material having an operating life comparable to the usual imported belting.
2. Following a closed discussion between representatives of the University and the Architects, Messrs. Hilland and Lehtinen returned to the meeting.
 3. The University requested that the proposal be resubmitted according to bidding requirements and current project conditions, and issued 2 copies of the contract documents for the materials transport system, dated 20 October 76. The following comments were made:
 - a) An addendum will be issued to modify the bid form and technical specifications.
 - b) Award will be based on installation schedule, system performance, and total project costs, including equipment, change order and non-building costs.
 - c) Existing obstructions of the pathway and other qualifications regarding the specifications and/or drawings are to be noted in the bid documents at the time of submittal.
 4. Details of the system configuration as shown on the drawings, deduct alternate and technical specifications were then reviewed for intent.

TAC will prepare addendum.
Hilland will advise on content of unit price schedule and system specifications.

cc: All present
HSAE



THE ARCHITECTS COLLABORATIVE INC.

JEAN B. FLETCHER 1945 1965
WALTER GROPIUS 1945 1969
NORMAN FLETCHER
JOHN C. HARKNESS
SARAH P. HARKNESS
LOUIS A. McMILLEN

RICHARD BROOKER
ALEX CVIJANOVIĆ
HERBERT GALLAGHER
WILLIAM J. GEDDIS
ROLAND KLUVER
PETER W. MORTON
H. MORSE PAYNE
ERNEST L. BIRDSALL
TREASURER

ROBERT F. CRANE
HOWARD ELKUS
ALLISON GOODWIN
BASIL HASSAN
JOHN HAYES
JOSEPH HOSKINS
LEONARD NOTKIN
RICHARD SABIN
DAVID SHEFFIELD

QAZI B. AHMED
ROBERT BARNES
KENDALL P. BATES
SERGIO BERIZZI
SERGE CVIJANOVIĆ
ROYSTON DALEY
ROBERT DEWOLFE
GREGORY DOWNES
GAIL HAVIARAS
THOMAS LARSON
RALPH MONTGOMERY
PERRY NEUBAUER
MICHAEL PRODANOU
RICHARD PUFFER
WALTER ROSENFELD
JOHN J. SCOTT
EDMUND SUMMERSBY
KENNETH TAYLOR
MALCOLM TICKNOR
ROBERT TURNER
ROBERT WILSON
LAURENCE ZUELKE

27 October 1976

Mr. James Lehtinen
R.O.I. Systems-Room 108
730 Waukengan Road
Deerfield, Illinois 60015

Regarding: University of Minnesota
Health Sciences Expansion
Unit B/C Materials Transport System
TAC Job No. 75046

Dear Jim:

Two sets of drawings and specifications dated 20 October 1976, for the Materials Transport System in Unit B/C at the University of Minnesota are enclosed for your use. One set of the Contract Documents for Unit B/C is included as information only.

In addition, sepias of the following drawings are provided to facilitate layout of revised pathway and station configurations:

Table with 3 columns: Drawing, Description, Date. Rows include A3-4 (1st Floor, East), A3-7 (2nd Floor, East - Medical Records), A3-7 (2nd Floor, East - Business Office), and MTS-4 (Plans and Sections).

A revised technical specification, wage rate schedule and other addenda will be issued by mail next week.

Please call me at any time if you have questions.

Very truly yours,

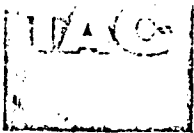
THE ARCHITECTS COLLABORATIVE, INC.

Herman (handwritten signature)

Herman B. Zinter
ljg

- cc: R. Dickler, C. Hewitt, N. Omundson, R. James, P. Maupin, A. Hilland, E. Kogl, HSAE

Vertical tracking form with columns for DATE, COPY, ATTN, INIT. Includes handwritten date 11/1/76 and initials JS, RB, JG, RS, RG, KR, HV.



THE ARCHITECTS COLLABORATIVE INC.

STAN B. FLETCHER
1945 '965
WALTER GROPIUS
1945 '969
NORVAN FLETCHER
JOHN C. HARKNESS
SARAH P. HARKNESS
LOUIS A. McMILLEN

5 November 1976

RICHARD BROOKER
ALEX CVIJANOVIC
HERBERT GALLAGHER
WILLIAM J. GEDDIS
ROLAND KLUVER
PETER W. MORTON
H. MORSE PAYNE
ERREST L. BIRDSALL
TREASURER

Hilland Associates, Ltd.
Attn: Mr. Arne T. Hilland
4559 Stoneledge Lane
Manlius, NY 13104

ROBERT F. CRANE
HOWARD ELKUS
JOHN HAYES
JOSEPH HOSKINS

Re: University of Minnesota
Health Sciences Expansion
Unit B/C Materials Transport System
TAC Job No. 75046

O A Z I A H M E D
KENDALL P. BATES
JAMES BURLAGE
SERGE CVIJANOVIC
ROYSTON DALEY
GREGORY DOWNES
ALLISON GOODWIN
THOMAS LARSON
RALPH MONTGOMERY
PERRY NEUBAUER
LEONARD NOTKIN
MICHAEL PRODANOU
WALTER ROSENFELD
RICHARD SABIN
DAVID SHEFFIELD
EDMUND SUMMERSBY
MALCOLM TICKNOR
ROBERT TURNER
ERNEST WRIGHT
LAURENCE ZUELKE

Dear Arne:

At the pre-bid conference in Minneapolis on 27 October 1976 and during subsequent telephone conversations, we discussed alternatives in developing stations in Mayo Hospital on Levels 1 and 2. One alternative, which is shown on Drawing MTS - 4, assumes that Room D208 (Blood Bank Laboratory) and Room D206 (Office) will remain in present locations on Level 2. From field inspections, we know that this plan will require the relocation of a major duct in the ceiling strata of Level 1 to provide a clear pathway for the station configurations shown.

A second alternative is to relocate the Laboratory and Office and provide more space for system equipment, carts, work surfaces, and circulation at the Materials Transport Station and Record Lift at Level 2. Acceptance of this alternative depends on the improvement in station design, and relative installations costs and change order costs.

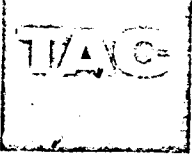
We would appreciate receiving your specific comments regarding optimum station layout and estimated costs for both of the options to assist in the resolution of the materials transport system design.

To review the details of your Bid and proposals for the stations in Mayo Hospital, we would like to schedule a meeting with you at the University on Wednesday, 17 November 1976, at 1:00 p.m. in Room 4110, Powell Hall. This follows the day of bid opening as modified by Addendum No. 1, which was mailed under separate cover.

U. S. MAIL
DATE: 11/24/76

TO: HILLAND ASSOCIATES																					
ATTN: MR. ARNE T. HILLAND																					
COPY					X																
TO:	ICH	AK	BT	XI	Q	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

3714



THE ARCHITECTS COLLABORATIVE INC.

Re: University of Minnesota
Unit B/C Materials Transport System
5 November 1976
Page 2

Please let me know if this arrangement is satisfactory and whether or not you have any questions about the subject stations.

Very truly yours,

THE ARCHITECTS COLLABORATIVE, Inc.

Herman B. Zinter

- cc: Ms. N. Omundson
- Messrs: C. Hewitt
- R. James
- E. Kogl
- P. Maupin
- R. Dickler
- J. Coleman
- HSAE

HBZ:ld

BID FORM - FOR LUMP SUM CONTRACTS
 (Combined Form for all Contract Divisions)

TO THE: REGENTS OF THE PROPOSAL FOR MATERIALS TRANSPORT SYSTEM
 UNIVERSITY OF MINNESOTA (contract division)
 MINNEAPOLIS, MINNESOTA

ATTENTION: ROBERT JAMES PROJECT: UNIT B/C OF THE
 DIRECTOR OF PURCHASING HEALTH SCIENCES EXPANSION
 (PURCHASING AGENT) LOCATION: MINNEAPOLIS, MINNESOTA
 2610 UNIVERSITY AVENUE DATE: November 12, 1976
 ST. PAUL, MINNESOTA 55114

(1) Bid of J. E. COLEMAN CO./Farbman, a Joint Venture
 (Firm name - hereinafter referred to as the "Bidder")

(2) The Bidder, in compliance with Advertisement for Bids, hereby submits the following Bid for the MATERIALS TRANSPORT SYSTEM in connection with Unit B/C, Health Sciences Expansion, Minneapolis, Minnesota, Project Number MINN. 18 (HP).

(3) The Bidder agrees to accomplish the Work in strict compliance with the drawings, specifications and Contract Documents, dated 20 October 1976, prepared by The Architects Collaborative, Inc., and Health Sciences Architects and Engineers, Inc., and as stated in the attached letter dated 11/12/76.

(4) The Bidder, having examined the drawings, specifications and related documents, visited and examined the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed Project including the availability of materials and labor, hereby proposes to furnish all labor, materials, services, and supplies, and to accomplish the Work for which this Bid is submitted, in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this Bid is a part.

(5) Addenda: The Bidder hereby acknowledges that Addendum instructions numbered 1 and 2 have been received and the requirements therein have been incorporated in this Bid.

(6) Completion of Work: The Bidder hereby agrees to commence work under this Contract on or before the time stipulated in the written "Notice to Proceed" in accordance with the General Conditions, and to complete all Work under this Contract on or before the dates specified in Specification Section 01200 and other provisions of the Contract Documents.

(7) In completing this Bid, the Bidder shall complete the Bid in both words and figures. Should any Alternate Proposal result in no difference in cost, the Bidder shall write "NO CHANGE" for the Alternate. The Bidder shall submit a bid or "No Change" for each Alternate listed under his Contract Division. Refer to Section 01100 - Alternates.

U. OF MINN.	DATE: <u>11/22/76</u>	ATTN:																														
		COPY																														
		JCH	RK	RT	KT	JS	DW	RB	JG	KS	RJ	KR																				
																						UM HEALTH SCIENCES INIT B/C										A3-1

(8) MATERIALS TRANSPORT SYSTEM BID (MTS)

BASE BID MTS: Bidder agrees to perform all of the Materials Transport System Construction Work for the sum of _____

_____ \$ 567,840.00

ALTERNATE MTS-1: Omit Station 17 (Dental), Floor 7, Unit B/C

DEDUCT _____ \$ 10,500.00

ALTERNATE MTS-2: Omit Station 16 (Psychiatry), Floor 6, Unit B/C

DEDUCT _____ \$ 10,500.00

ALTERNATE MTS-3: Omit Station 15 (Neurology), Floor 5, Unit B/C

DEDUCT _____ \$ 10,500.00

ALTERNATE MTS-4: Omit Station 7 (Ambulatory Surgery), Floor 1, Unit B/C

DEDUCT _____ \$ 25,600.00

ALTERNATE MTS-5: Omit Station 10 (Business Office/Admissions), Floor 2, Unit B/C DEDUCT _____

_____ \$ 13,900.00

ALTERNATE MTS-6: Omit Station 20 (Mayo 1), Floor 1, Mayo Hospital)

DEDUCT _____ \$ 5,100.00

ALTERNATE MTS-7: Omit Station 21 (Mayo 2), Floor 2, Mayo Hospital, including all track, switches, hardware and monitoring connecting to main line pathway in Unit B/C. DEDUCT _____

_____ \$ 39,300.00

(9) Unit Prices: Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those on which the Bid is based, by order or approval of the Architect/Engineer, the undersigned agrees that the following supplemental Unit Prices will be the basis of payment to him or credit to the Owner for such addition, increase or decrease in the work. Unit Prices given shall represent the exact net amount per unit to be paid the Contractor (in the case of additions or increases) or to be the basis for refund to the Owner (in the case of decreases). The Unit Prices shall include associated supervisory monitoring and installation. No additional adjustment will be allowed for overhead, profit, insurance, compensation insurance or other direct or indirect expenses. The Owner shall have the right to reject any or all proposed Unit Prices at any time prior to signing the Agreement, in which case the cost of extra work shall be as determined by one of the other methods set forth for changes in the work, in the General Conditions. Unit Prices given herein shall be for additional work only. Decreased work at Unit Prices shall be at the "Add" price less fifteen percent (15%).

As per Section 14701: Complete the line items under this Section or Section 14700, as applicable:

- (a) Dual Carriageway Components, including hangers, anchors, clamps, splices, slider beds, belting and guard rails, per assembly.

Channel, Horizontal, 8' Module	\$ 400.00
Horizontal Offset, 20 Degrees	\$ 1,200.00
Horizontal Offset, 45 Degrees	\$ 1,200.00
Horizontal Offset, 90 Degrees	\$ 1,600.00
Vertical Offset, 0-20 Degrees	\$ 800.00
Belt Divider	\$ 800.00
End Pulley Assembly	\$ 500.00
Drive Unit, including Starter	\$ 2,200.00

- (b) Station Components, including carriageway, supports, controls and directory, per assembly:

End Station Assembly, 3 Transport Units	\$ 2,700.00
On-Line Station Assembly, 3 Transport Units	\$ 3,500.00
Transfer Station Sssembly, 3 Transport Units	\$ 3,500.00
Multifloor Station Assembly, 3 Transport Units	\$ 10,500.00

- (c) Switching Units (not included with Station Components above), including control, read heads, supports and hardware, per each unit:

Switch, Entry	\$ 1,200.00
Switch, Exit	\$ 1,200.00
Switch, Reversing	\$ 1,900.00

- (d) Transport Units, complete with hinged cover assembly, keylock and escort memory code devices per unit:

Transport Unit:	\$ 150.00
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- (e) Transport Unit Inserts, including hardware, per each unit:

Removable Insert (with handle)	\$ 75.00
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- (f) Fire Dampers and Motorized Fire Doors, including releasing mechanism and actuating device, per each assembly:

Fire Damper Assembly, Class A (Dual Carriageway)	\$ 150.00
Fire Damper Assembly, Class B (Dual Carriageway)	\$ 140.00

(g) Fire dampers, including release mechanisms and actuating devices, and air baffles, per each assembly:

Fire Damper Assembly, Class A (Single Track)	\$ _____
Fire Damper Assembly, Class A (Double Track)	\$ _____
Fire Damper Assembly, Vertical, Class B (Single Track)	\$ _____
Fire Damper Assembly, Vertical, Class B (Double Track)	\$ _____
Fire Damper Assembly, Horizontal, Class B (Single Track)	\$ _____
Fire Damper Assembly, Horizontal, Class B (Double Track)	\$ _____
Air Baffle Assembly, Single Track	\$ _____
Air Baffle Assembly, Double Track	\$ _____

(10) Bid Security: The Bidder submits the attached Bid Security in the form of a Certified Check, Cashier's Check or Bid Bond, in accordance with the Instructions To Bidders, drawn to the order of the Regents of the University of Minnesota. The Bidder acknowledges the Bid Security may be retained by the University as specified in the Instructions To Bidders and agrees if the Bidder defaults in executing the Contract within the time set forth, or in furnishing the Performance Bond as specified, the check will become the property of the University (or the Surety will pay the University in the amount of the bond) as liquidated damages for the delay and additional expense to the Owner caused thereby.

(11) Holding of Bids: The Bidder agrees this Bid shall be good and may not be withdrawn for forty five (45) calendar days after the scheduled time and date for receiving bids, except that Alternate Bids shall be good and the work omitted by any accepted alternate may be ordered reinstated by the University at any time up to one hundred twenty (120) calendar days after the scheduled time and date for receipt of bids.

(12) Acceptance of Bids: The Bidder understands the University reserves the right to accept any Bid it determines in its best interest, to accept Alternates as stated in the Instructions To Bidders, and to reject any and all Bids. Upon receipt of notice of award of a Contract (acceptance of this Bid) the Bidder will execute the Agreement, in the specified form, within 10 regular work days thereafter and to deliver a Contractor's Performance Bond, in the stipulated Form, in accordance with Article 8 of the Instructions To Bidders and Paragraph 7.5 of the General Conditions.

(13) Informalities: It is understood by the Bidder the University reserves the right to waive informalities in bids received and minor discrepancies in bidding procedure.

(14) Information about Bidder:

If a Corporation, incorporated in the State of New York
 Qualified to conduct business in the State of Minnesota? Yes
 If a Partnership, full names of all Partners are Joint venture
Joseph E. Coleman dba Joseph E. Coleman Co.
M. Farbman & Sons, Inc.

(15) Schedule:

Engineering prerequisite to beginning of installation can be complete on:
January 15, 1977.

Shop Drawings can be complete and ready for submittal on:
December 15, 1976.

Delivery of materials to the field for installation can begin on:
February 1, 1977.

Installation in the field can begin on:
February 15, 1977.

(16) Certification for Equal Opportunity
and Affirmative Action:

(Must Be Signed By Bidder)

The bidder hereby certifies that all of the specified requirements for
Equal Opportunity and Affirmative Action, General Conditions, Article 15,
will be fully complied with, as stated, for this Project.

Joseph E. Coleman Owner
(Signed) Joseph E. Coleman, Title

(17) Respectfully submitted:

Correct and full name of Bidder

Name Joseph E. Coleman Co./ Farbman, a Joint Venture

Address 342 Madison Avenue, New York, NY 10017

By Joseph E. Coleman Title Owner

By _____ Title _____

(Affix Corporate Seal if bid is by a corporation)

Date November 12, 1976

J. E. COLEMAN CO.

342 MADISON AVENUE • NEW YORK, N.Y. 10017 • TEL. 212 MU7-2154

materials handling equipment
processing equipment
conveying systems

November 12, 1976

Regents of the University of Minnesota
Minneapolis, MN

Attn: Mr. Robert James
Director of Purchasing
(Purchasing Agent)
2610 University Avenue
St. Paul, MN 55114

Re: Proposal for Materials Transport System
Unit B/C of the Health Sciences
Expansion
Minneapolis, Minnesota

Gentlemen:

We herewith submit our bid for the referenced project.

This bid is submitted in the name, "J.E. Coleman Co./Farbman, a Joint Venture".

The following comments constitute an integral part of our bid:

1. The bid bond, and performance bond is to cover the construction as specified and the one year guarantee period only, and will not extend through the five year maintenance period. We may negotiate a separate bond for that period if required and at the expense of the owner.
2. We wish to confirm our understanding that there are no liquidated damages for failure to complete the project on time. It is our plan and intention to complete by the specified date. However, since the time allowed is quite close to the time required, we do not agree to liquidated damages.
3. The right-of-way must be provided for our equipment as indicated on our drawings, as a responsibility of others.
4. The following changes to your specifications are necessary in order to comply with the standard design and specifications of the specified equipment manufactured by W. B. McGuire Engineering Co., Ltd. The time allowed does not permit us to plan for any major redesign. Changes are referred to by page and paragraph number of your specification, Addendum 1, dated November 4, 1976 (note that Section 14701 refers to our equipment and not Section 14700):

<u>Paragraph</u>	<u>Page</u>	<u>Comment</u>
2.1 H	14701-4	Change 100 to read 90.
2.1 P	"	Delete last sentence of paragraph.
2.1 R	"	Delete "(3) Seconds" and substitute "from 12 to 60 seconds".
2.2 I	14701-5	Delete last sentence of paragraph.

<u>Paragraph</u>	<u>Page</u>	<u>Comments</u>
2.2 J	14701-6	Change last sentence to read "Alarms shall be installed at each station".
2.4 C	14701-7	Change 100 destinations to 90.
2.4 D	14701-7	Delete entire sentence.
2.4 E	14701-7	Change 180-degrees to 90-degrees and delete last sentence of paragraph.
2.4 H	14701-7	Change 14½" deep to read 14" deep.
2.6 A	14701-9	Delete last sentence of paragraph.
2.6 N (2)	14701-10	Delete last sentence of paragraph.
2.6 V	14701-11	Delete last sentence of paragraph.
2.7 A	14701-11	Delete from the last sentence "---power supply --, and fire dampers ---, transport unit travel, power supply, operating voltage, station loading, and traffic throughout".
2.7 B	14701-11	Delete entire paragraph.
2.7 E	14701-12	Delete entire paragraph.
2.7 F	14701-12	We use panel lights to indicate all functions, not illuminated zones.
2.7 H	14701-12	Delete entire paragraph.
2.7 L	14701-13	Delete entire paragraph.
2.7 N	14701-13	The maximum number of future stations must be stated before we accept or reject this condition.
2.10 A	14701-14	Add: "Fire dampers manufactured by Air Balance Co., Chicago, Illinois shall be acceptable as approved equal.
2.10 C	14701-14	The description of air baffles does not accurately describe ours. We will have to discuss our designs with you to arrive at a suitable design.
3.4 A	14701-15	Add: ",and no other."
3.4 B	14701-15	Delete entire sentence.

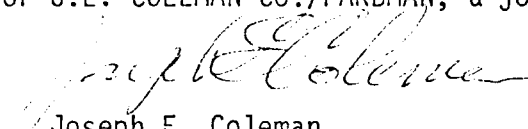
Regents of the University of Minnesota
November 12, 1976
Page Three

We hereby submit a price of \$2600.00 per month for service and maintenance of the MTS system for a five year period. This is subject to price adjustment as provided in the specifications and takes into account the Owners right to cancel at any time with 30 days notice. Repairs brought about by virtue of misuse of the equipment, damage, deterioration or wear occasioned by chemical or abrasive actions or excessive heat will be in addition and at the Owners expense.

We thank you for the opportunity of submitting this quotation and trust that we will be favored with your valued order.

Very truly yours,

for J.E. COLEMAN CO./FARBMAN, a joint venture


Joseph E. Coleman

J. E. COLEMAN CO.

GENERAL CONDITIONS OF SALE

DESIGNATION OF PARTIES:

The term "Company" whenever used herein, refers to J. E. Coleman Company, having its principal office in New York City, N.Y. The term "Purchaser" whenever used herein, refers to the person, partnership, firm corporation, governmental unit or agency that has contracted to purchase the machinery, equipment and/or services.

STATUS OF QUOTED PRICES:

All prices and quotations in this Proposal are firm for a period of thirty (30) days from the date of this Proposal in the absence of notice of change thereof given to the Purchaser within such period and prior to acceptance of this Proposal by both the Purchaser and the Company. Prices and quotations in this Proposal that have been in effect more than thirty (30) days from the date of the Proposal are subject to change by the Company without notice at any time prior to the acceptance of this Proposal by both the Purchaser and the Company and should be reconfirmed.

TAXES:

This proposal does not include Federal, State or Local Sales, Use, Privilege, Occupation or Excise Taxes or other Taxes of any kind applicable to the sale of the machinery, equipment and/or services involved. These taxes shall be paid by the Purchaser either direct to the taxing authority or (if collected by the Company) to the Company upon receipt of the Company's invoice for the amount of the tax. In lieu of such payment the Purchaser may provide the Company with a tax exemption certificate acceptable to the taxing authority. In case of controversy as to whether this transaction is taxable, the Purchaser agrees to remit the amount of the tax to the Company pending a specific ruling by the taxing authority which assesses or collects the tax. The purchaser agrees to accept such ruling as final, unless the Purchaser desires to contest the ruling at his own expense.

DRAWINGS:

The Purchaser shall furnish the Company with all information, instructions, and drawings requisite to the specifications of the machinery, equipment and/or services. After acceptance of this Proposal by the Purchaser, such drawings will be furnished by the Company as are necessary for the work, without unreasonable delay, and the Purchaser shall check, alter or approve and return one set of such drawings without unreasonable delay. Additional time required for changes in the drawings, requested by the Purchaser, beyond the first revision will be charged for at the rate of \$7.00 per hour. This Proposal, including any drawings pertaining thereto, is the property of the Company until and unless accepted by the Purchaser. It contains confidential information and is submitted to the Purchaser on condition that he and his representatives agree by receiving it not to reproduce or copy it in whole, or in part, without permission, or to furnish information from it to others, or to use it in any manner contrary to the directions of the Company. In the event the Proposal is not accepted, it shall be returned to the Company, upon request.

FOUNDATIONS:

Unless otherwise specified, Purchaser shall furnish and install necessary foundations, including foundation bolts, shall do such cutting and patching as may be required and shall assume all responsibility for the strength of the building and the supporting equipment.

LIABILITY FOR DELAYED SHIPMENT OR INSTALLATION:

The Company shall not be liable for any loss or damage resulting from delay in shipment or in installation (if the Company has assumed any obligation with respect to installation hereunder) caused by fires, floods, strikes, riots, thefts, or accidents, delays in transportation, including but not limited to inability to procure materials, or any other cause whatsoever for which the Company is not directly responsible. The Company shall not be liable, in any event, for loss of anticipated profits, loss by reason of plant shutdown, non-operation or increased expense of operation of other equipment, or other consequential loss or damage of any nature. If shipment or installation be delayed by or through Purchaser, final payment shall become due, as specified herein.

LOSS, DAMAGE OR DESTRUCTION OF MACHINERY OR EQUIPMENT:

From and after the delivery of the machinery or equipment covered by this Proposal to a carrier for shipment to the Purchaser, said Purchaser shall be obligated to the Company for the purchase price thereof; and the risk of damage, destruction or loss, in whole or in part, and from any cause or combination of events of said machinery or equipment shall be upon the Purchaser and shall not be the responsibility of the Company after delivery to the carrier.

INSURANCE: (IF INSTALLATION IS BY THE COMPANY)

The Company shall provide and maintain at its own expense, until completion of the work, the following forms of insurance:

- Workmen's Compensation Insurance, including Employers Liability Insurance, in accordance with the laws of the state in which installation is required.
- Public Liability Insurance with an individual limit of not less than \$500,000.00 and a total limit for any one accident of not less than \$1,000,000.00.
- "Hold Harmless" coverage will be provided only upon request and at additional cost to the Purchaser.

Notwithstanding the foregoing the Purchaser shall bear the risk of damage, destruction and loss of machinery, equipment and installation thereof, and the Purchaser shall provide and maintain at its own expense, until completion of the work, fire, windstorm and extended coverage insurance upon said machinery, equipment and the installation thereof in an amount equal to at least the total cost to Purchaser of such machinery, equipment and installation thereof, to continue effective until the installation thereof has been completed.

COMPLETE INSTALLATION: (IF INCLUDED IN THE PURCHASE PRICE)

The Company shall furnish a competent working Foreman to supervise and the technical and skilled labor necessary in the installation of the machinery or equipment to be furnished hereunder and their traveling and living expenses while such work is in progress, as well as the necessary tools, scaffolding, blocking, rigging or other equipment required in the installation of said machinery or equipment. The Purchaser shall provide, at his own expense, compressed air, water, plumbing, and electrical energy necessary for the operation of power tools used by the Company crews, suitable storage and work space acceptable to the Company and necessary to the completion of the project; and shall receive, unload and store all equipment and/or materials shipped to the jobsite by the Company. Compressed air, water, plumbing, wiring, proper electrical power, and any other resource necessary to the proper hook-up and operation of the equipment or machinery are to be made available by the Purchaser at the most convenient and logical location adjacent to the machinery or equipment specified, as recommended by the Company. Under no conditions will the Company be liable where the foregoing utilities, as requested, are not available nor will the Company be liable under any conditions for supplying the foregoing utilities to the building site.

GENERAL CONDITIONS OF SALE - Continued

PERMITS:

Purchaser shall provide and pay for all permits, licenses, and certificates necessary for the installation and the performance and the necessary work for completion of installation.

OVERTIME:

The quoted prices are based on the Company crew being able to perform the installation work unhindered and in one continuous operation during normal eight hour weekdays. If it shall be necessary for the Company crew to work in excess of eight hours on weekdays (Monday through Friday), or to work on Saturdays, Sundays or holidays, the Purchaser shall be invoiced for and shall pay (in addition to the regular contract or cost plus rates) the net difference between the regular scale of pay and the overtime rate plus 10 per cent to cover wage taxes and insurance. If the installation work is interrupted by the Purchaser resulting in additional cost to the Company, such costs will be invoiced to and paid for by the Purchaser on a net cost basis.

ASSIGNMENT AND SUBLETTING:

The Company shall at all times have the right to assign or sublet any contracts relative to this Proposal in whole or in part without the consent of the Purchaser.

INSTALLATION SUPERVISION:

In the event the foregoing Proposal specifies that the responsibility for installation is borne by the Purchaser, or any one other than the Company designated by Purchaser, and that the Company shall furnish a qualified installation supervisor for the purpose of providing advisory and/or technical information to aid or expedite installation, it is herein agreed that a charge of ~~per diem~~ per diem, or any part thereof, as well as travel costs by methods chosen by the Company, from its location to jobsite and return, shall be invoiced to and paid for by the Purchaser. The function of the installation supervisor, as designated by the Company, is understood to be of an advisory capacity only and, neither Company nor individual designated by Company, shall be liable for loss, damage, or delay or any other consequential loss or damage of any nature.

MACHINERY AND EQUIPMENT WARRANTY:

The machinery or equipment herein specified is warranted to the Purchaser to perform within the limits specified in the foregoing Proposal and general conditions of sale. If the machinery or equipment herein specified does not perform within the specified limits, written notice shall be given by the Purchaser to the Company within thirty (30) days from its first use, stating wherein the machinery or equipment fails so to perform and a reasonable time shall be allowed the Company to get to the machinery or equipment with skilled workmen and remedy the alleged defect, if alleged defect be of such a nature that a remedy cannot be suggested by letter, Purchaser agrees to render all necessary and friendly assistance in making the machinery or equipment satisfactory. In the event it is mutually agreed by Purchaser and Company that the machinery or equipment cannot be made to operate satisfactorily within the limits specified in the foregoing Proposal, Purchaser may return such of the machinery or equipment as is of Company manufacture to the Company for full credit. The Company will repair or replace with a similar part, f.o.b. its works where made, any part of its own manufacture in the above specified property which, within one year from shipment, proves defective in material or workmanship if the Purchaser delivers such defective part to the Company for inspection, f.o.b. its said works, within such year, provided said equipment has been installed and is operated by the Purchaser in accordance with generally approved practice. However, the Company will not be responsible for loss of anticipated profits, loss by reason of plant shut-down or any other consequential damages or any further loss by reason of the failure of the machinery or equipment to perform within the limits specified in the foregoing Proposal and general conditions of sale or by reason of any defect in the machinery or equipment resulting from defective material or workmanship, and the Company does not warrant that the machinery or equipment meets local, municipal, or state ordinances, laws or regulations. This warranty does not cover products, accessories, parts or attachments which are not manufactured by the Company except to the extent of the warranty given by the actual manufacturer thereof.

INSTALLATION WARRANTY: (IF INSTALLED BY THE COMPANY AND INCLUDED IN PURCHASE PRICE)

The Company shall repair or replace, f.o.b. point of shipment any parts or equipment described in the foregoing Proposal which, within one year from date of shipment, are found to be defective in material or workmanship, if said parts or equipment are operated by the Purchaser in accordance with generally approved practice, provided that the Purchaser notifies the Company in writing of such defect within fifteen (15) days from and after the alleged defect becomes apparent to the Purchaser. In no event and under no circumstances shall the Company be liable for loss of anticipated profits, loss by reason of plant shut-down or any other consequential damages or for any sum in excess of replacement or repair price of the parts or equipment proven defective by reason of any such defect. This warranty does not cover machinery, equipment and/or services not manufactured or supplied by the Company except to the extent of the warranty given by the actual manufacturer or supplier.

RETURNED GOODS AND CANCELLATIONS

Goods are not to be returned until Purchaser has received the Company's written permission to do so. Goods returned through no fault of Company will be subject to a charge of 15 per cent of net selling price in addition to whatever restocking expense will be necessary to restore the material to a saleable condition. Transportation charges on returned goods must be prepaid by the Purchaser. No request for return of goods will be considered unless received by the Company within thirty (30) days after completion of installation.

In the event of cancellation, all costs expended by the company in performance of the purchase order will be payable by the purchaser plus 10% for overhead and 10% for profit, terms net cash.

PROPERTY TITLE:

The title to and right of possession of the property above specified shall remain in the Company until payment in full of the purchase price hereinbefore stated in cash, including deferred payments and interest, whether evidenced by notes, renewals or otherwise, has been made to the Company. Until such payment, said property shall remain the personal property of the Company whatever may be the mode of its attachment to realty, or otherwise. The Company may enter any premises for purposes of removal.

MODEL CHANGE:

The Company reserves the right to make improvements or changes from time to time on the kind of machinery or equipment covered by this Proposal without obligation to the Purchaser to install such change on the machinery or equipment hereby purchased.

ACCEPTANCE:

Whenever any period of time is specified herein, time shall be deemed to be of the essence of this contract. This Proposal, when approved by the Purchaser and submitted to and accepted by the Company, expresses the entire agreement between the parties. In the event that Purchase Orders or conditions of purchase conflict in any manner, in whole or in part, with the foregoing conditions of sale, it is agreed that the conditions of sale herein written shall be binding. All previous negotiations, conversations and understandings are merged herein and this Proposal cannot hereafter be modified except by an amendment in writing submitted by the Purchaser and accepted by an officer of the Company. This Proposal is not to be deemed binding upon the Company until accepted on behalf of the Company

THE ARCHITECTS COLLABORATIVE Inc.
HEALTH SCIENCES ARCHITECTS AND ENGINEERS, Inc.

UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION

MEETING NOTES

DATE: 17 November 1976

TAC JOB: 75046, Unit B/C Materials Transport System (MTS)

SUBJECT: Bid Submitted by J.E. Coleman/Farbman ("Distributor" System)

PLACE: Room 4112, Powell Hall

NOTES BY: Herman Zinter

PRESENT: Joseph Coleman, James Lehtinen (Coleman/Farbman)
Robert Dickler, Nancy Omundson, Greg Kujawa, Paul Maupin,
Bob Swanson, Eugene Kogl, Robert James (U/Minn)
John Scott, Herman Zinter (TAC/HSAE)

The purpose of the meeting was to review assumptions and qualifications contained in the bid of the J.E. Coleman Co./Farbman, a Joint Venture, for the Materials Transport System in Unit B/C. The following items were discussed:

ITEM ACTION REQUIRED

1. Reference was made to the documents submitted by J.E. Coleman/Farbman, including the completed bid form with separate comments of clarification, each dated 12 November 1976, and the following drawings of the Ada-Bec "Demand Delivery System":

<u>Dwg. No.</u>	<u>Description</u>	<u>Date</u>
M48/DDS	1st Floor Level, Unit B/C	19 Oct 76
M50/DDS	2nd Floor Level, Unit B/C	

2. The above listed drawings indicate conditions of system installation for the previous J.E. Coleman/Farbman proposal for Unit B/C, dated 25 October 1976, and do not indicate a) revised pathway and station requirements, b) obstructions in the pathway based on field inspection, or c) alternative configurations for stations in the Mayo building.

J.E. Coleman will furnish to U/Minn and TAC prints of new layout drawings that were prepared (and completed) for the subject bid, including options for the Mayo stations.

ITEM

ACTION REQUIRED

3. Other comments regarding the bid information are as follows:

a. J.E. Coleman/Farbman, a Joint Venture, was formed to furnish a Contractor's Bond for the Project. It was indicated that Farbman is a plumbing contracting firm that has been in business for approximately 80 - 90 years. The J.E. Coleman Company has specialized in materials handling, processing or conveying systems and equipment (manufactured by others) for approximately 25 years.

b. A purchase order agreement for Ada-Bec conveyors and controls, marketed as the "Distributor System", has been arranged with the W.B. McGuire Engineering Co., Ltd of Montreal which will furnish and guarantee materials only.

c. Installation of pathway and station equipment will be accomplished by 1 to 6 millwrights, depending on project phase or conditions. Electrical work will be sub-contracted. Field supervision and coordination will be performed by J. Lehtinen.

d. J.E. Coleman Company "General Conditions of Sale", attached to the bid, was submitted only to furnish a copy of the contractor's standard warranty (as required by the specifications). J.E. Coleman indicated that the bid price includes a 4 percent tax on purchased materials, and that except for warranty on machinery and equipment, and installation, the conditions do not pertain to this project.

J.E. Coleman will furnish a letter to U/Minn and TAC to clarify conditions of sale.

4. It was noted that individual components, not the system, has UL approval. After discussion of other itemized comments (clarifications) regarding articles of the specifications, it was agreed that adjustments to the bid price would be required to either add or substitute controls, alarms or equipment as follows:

J.E. Coleman will furnish U/Minn and TAC a letter to confirm amount(s) of bid price adjustments, and additional product data to clarify UL approval of system (or components), type fire damper and type belt material.

a. To include a station-full alarm at the supervisory panel, the bid price would be increased.

ITEM

ACTION REQUIRED

- b. To furnish gravity operated air baffles as specified instead of motorized draft doors as proposed by J.E. Coleman/Farbman, the bid price would be reduced.
 - c. To include controls that conserve energy by automatically shutting-down unused lengths or zones of conveyors, the bid price would be increased.
 - d. Generally, to include all controls specified for the supervisory panel, the bid price would be increased. However, a technical review of system operation would be required to determine potential modifications and bid adjustment.
 - e. More information is required regarding the material and performance of conveyor belts and the type fire dampers before further adjustments (if any) can be determined.
5. J.E. Coleman/Farbman indicated that engineering and preparation of shop drawings, based on the use of standardized components throughout, would require 3 or 4 weeks.
- a. The plant has capacity to manufacture hardware and furnish material to the jobsite without causing delays in installation.
 - b. Due to present production schedules, the fabrication of electrical controls and assemblies would begin after approximately 15 January 1977, but this would not influence the schedule for work on components for this project.

S

R

Q

P

16-10 1/2

9-9

19-2

12

10

11

FOR CONTINUATION
PATHWAY, SEE DETAIL

ELEVATOR
LOBBY

LINE OF PATHWAY
ABOVE CEILING
NEW APPROACH TO
STATION

D110

RE
EX
RE
LF

SIDE

D103

STATION
20
(MAY 2-1)

LIFT

STATION
BELOW

NOTE:

STANDARD 2-STAGE LIFT THIS AREA
IF STATION 21 IS ELIMINATED.

CO.

J. E. COLEMAN CO.

342 MADISON AVENUE • NEW YORK, N.Y. 10017 • TEL. 212 MU7-2154

materials handling equipment
processing equipment
conveying systems

November 22, 1976

Regents of the University of Minnesota
Minneapolis, Minnesota

Attn: Mr. Robert James
Director of Purchasing
(Purchasing Agent)
2610 University Avenue
St. Paul, MN 55114

Re: Proposal for Material Transport System
Unit B/C of the Health Sciences Expansion
Minneapolis, Minnesota

Gentlemen:

With regard to our discussions during the meeting in Minneapolis on November 17th, I am enclosing our drawings no. MTS 1A, 2A, 3A, and 4A, which show the proposed conveyor routing. On drawing 2A we have marked potential conflicts in red.

With regard to draft doors, I want to confirm that our proposal did include 24 motorized draft doors at a total cost including electrical controls, field installation and wiring, of \$19,200.00. We understand from the meeting that you might very likely be satisfied with curtain-type air barriers or some other form of simple mechanical door. We would be willing to provide these and, until further details are worked out, would say that the cost should be within \$150 per door, or a total of \$3,600.00 for 24 doors.

We want to also confirm that we did include Minnesota Use Tax. We understand from the Commissioner of Taxation that the University is tax exempt and will therefore will not have to pay sales tax on the complete system which will be in the form of tangible personal property. Further, we understand that this exemption will not relieve us from the payment of Use Tax on all materials for the system which we must purchase and we have, therefore, included a 4% tax on our purchased materials.

The air balance UL approved fire dampers that we use are manufactured by Ventilating Products, Inc., 8152 Kirkville Road, Kirkville, NY, 13082. I have requested them to mail brochures directly to you.

With reference to Paragraph 3.4 B on page 14701-15 of your specifications, we wish to point out that although the system as a whole has not been tested and approved by Underwriters Laboratories, that we do use UL approved components throughout.

The J. E. Coleman Co. General Conditions of Sale which were attached to the proposal were solely for the purpose of providing you with a copy of our standard warranty which was requested in your specifications. The only paragraphs which are pertinent are those on page two entitled Machinery and Equipment Warranty,

DATE: 11/23/76		
COPY	ATTN:	INIT.
JCH		
RK		
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HV	X	
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NOV 23 1976

Regents of the University of Minnesota
November 22, 1976
Page Two

and Installation Warranty: (if installed by the company and included in purchase price).

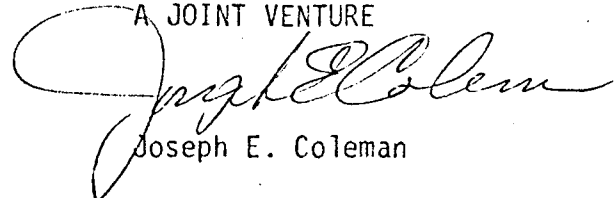
One other thing I would like to point out is that our containers travel upright throughout the system and do not require any internal pivots or gimbals for handling sample containers and the like. We therefore have a much greater capacity for handling this type of material and as a result should require fewer containers by comparison to the other system mentioned in your specifications. We have, however, included 120 containers as compared to 50 of the other type. This provides our system with a great deal more capacity in addition to the flexibility of being able to remove the containers for convenient manual handling. We also provide independent sending and receiving which adds to system flexibility.

We would also like to point out that our containers can be sterilized with steam. Also, if a container is inadvertently overloaded and put into the system, the system can handle it. We can take occasional overloads and for example, could handle a container loaded with 40 or 50 lbs. without harming or shutting down the system.

I trust this is all the additional information you require, but if there is more, please let me know and we will be happy to provide it.

Very truly yours,

for J. E. COLEMAN CO./FARBMAN,
A JOINT VENTURE



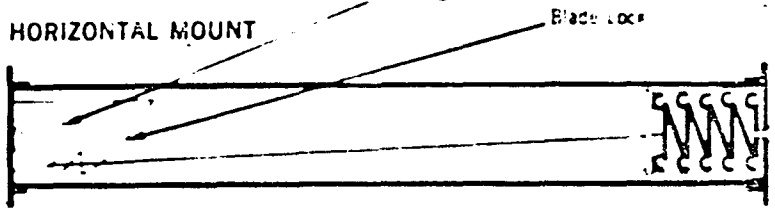
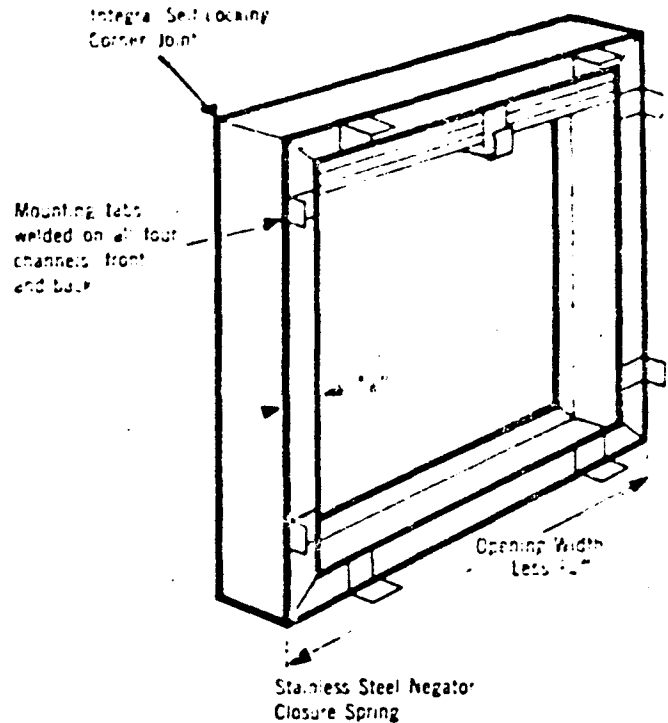
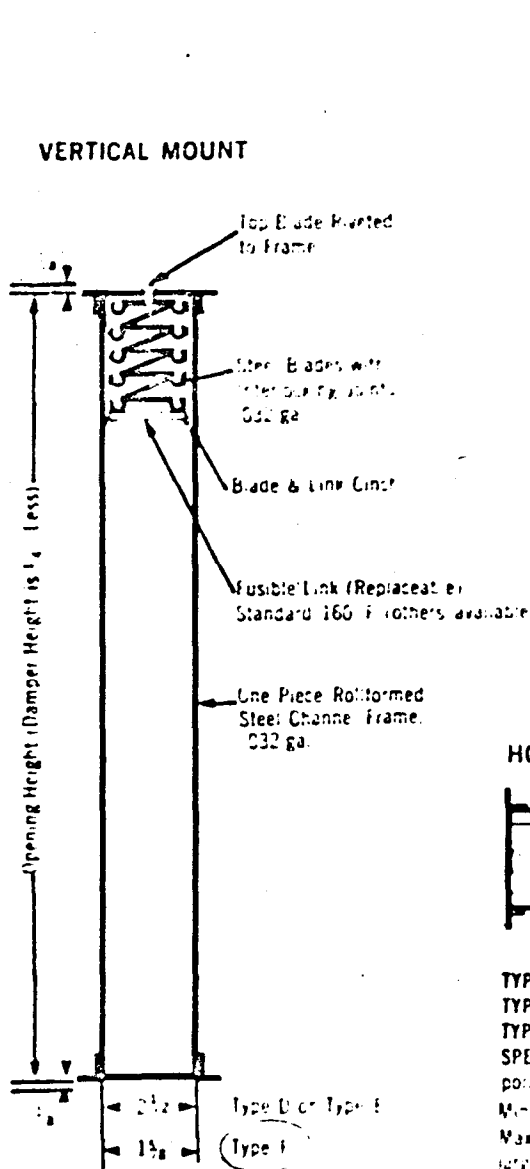
Joseph E. Coleman

JEC:st
Encs.

cc: The Architects Collaborative, Inc. ✓

PYRO/GARD Fire Damper

Horizontal & Vertical, Model 152A U.L. Labelled



TYPE D—2 1/2" deep channel frame, galvanized steel, horizontal or vertical
TYPE E—2 1/2" deep channel frame, stainless steel 304, horizontal or vertical
TYPE F—1 3/4" deep channel frame, galvanized steel, vertical only
SPECIAL TYPES—variations of 2 1/2" and 1 3/4" deep channel frames are available incorporating the Type B or Type C construction. Types BD, BE, CD, CE and CF.
 Minimum Size: 4" x 4" Opening Dimension
 Maximum Single Section Size: 40" x 40" Multiple section dampers are available in larger sizes contact factory

Labelled by Underwriters' Laboratories 1 1/2 hour rating. All materials as tested or approved by U.L.

UNDERWRITERS' LABORATORIES INC. CLASSIFIED FIRE DAMPERS FIRE RESISTANCE RATINGS 1 1/2 HR. (B) NO. <input type="text"/> SEE U.L. CLASSIFIED BUILDING MATERIALS INDEX	ACTION AIR INC. ROSELAND, N.J.
--	-----------------------------------

Materials: Standard construction galvanized steel
 Stainless steel optional, Model 152A.
 Underwriters Laboratories labelled for use in 2 hour fire partitions.
 See attached sheet for schedule of models and sizes.



PROJECT _____
 LOCATION _____
 ARCHITECT _____
 ENGINEER _____
 CONTRACTOR _____
 P.O. NUMBER _____
 DATE _____

J. E. COLEMAN CO.

342 MADISON AVENUE • NEW YORK, N.Y. 10017 • TEL. 212 MU7-2154

materials handling equipment
processing equipment
conveying systems

November 30, 1976

Regents of the University of Minnesota
Minneapolis, Minnesota
Attn: Mr. Robert James
Director of Purchasing
2610 University Avenue
St. Paul, MN 55114

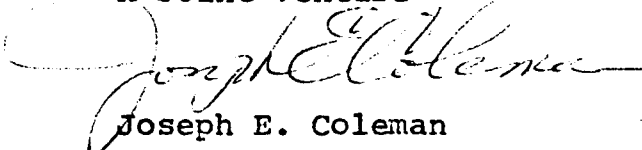
Re: Proposal for Material Transport System
Unit B/C of the Health Sciences
Expansion
Minneapolis, Minnesota

Gentlemen:

In your specifications, Addendum 1, page 14701-6, paragraph 2.2 J, you asked for an alarm for a full receiving station at the main supervisory panel as well as at the local stations. Our bid included alarms at the local stations only. To also add an alarm at the main panel in accordance with your specifications, please add \$7500.

Very truly yours,

for J. E. COLEMAN CO./FARBMAN,
A Joint Venture

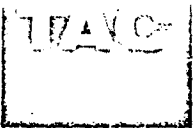

Joseph E. Coleman

JEC:st

cc: The Architects Collaborative, Inc. ✓

RECEIVED
DEC 2 1976
THE ARCHITECTS COLLABORATIVE, INC.

0 3711.4
R. DICKLER
N. OLUNDSON
P. MAUPIN
S. KOGL



THE ARCHITECTS COLLABORATIVE INC.

JEAN B. FLETCHER
1945 1965
WALTER GROPIUS
1945 1969
NORMAN FLETCHER
JOHN C. HARKNESS
SARAH P. HARKNESS
LOUIS A. McMILLEN

RICHARD BROOKER
ALEX CVIJANOVIĆ
HERBERT GALLAGHER
WILLIAM J. GEDDIS
ROLAND KLUVER
PETER W. MORTON
H. MORSE PAYNE
ERNEST L. BIRDSALL
TREASURER

ROBERT F. CRANE
HOWARD ELKUS
ALLISON GOODWIN
BASIL HASSAN
JOHN HAYES
JOSEPH HOSKINS
LEONARD NOTKIN
RICHARD SABIN
DAVID SHEFFIELD

GAZI B. AHMED
ROBERT BARNES
KENDALL P. BATES
SERGE CVIJANOVIĆ
ROYSTON DALEY
ROBERT DEWOLFE
GREGORY DOWNES
GAIL FLYNN
GERALD FOSTER
THOMAS LARSON
RALPH MONTGOMERY
PERRY NEUBAUER
IGOR G. PLATOUNOFF
RICHARD PUFFER
WALTER ROSENFELD
JOHN J. SCOTT
EDMUND SUMMERSBY
KENNETH TAYLOR
MALCOLM TICKNOR
ROBERT TURNER
ROBERT WILSON
LAURENCE ZUELKE

22 October 1976

Mosler Airmatic Systems Division
Attn: Mr. Lester Garb
New England Area Manager
40 West 40th Street
New York, NY 10018

Re: University of Minnesota
Health Sciences Expansion
Unit B/C Materials Transport System
TAC Job: 75046

Dear Les:

Two sets of drawings and specifications for the Materials Transport System in Unit B/C at the University of Minnesota have been enclosed for your use.

We look forward to arranging a pre-bid conference with you in Minneapolis next week. At that time, we will review the site conditions and progress of construction. Also, sets of the contract documents for Unit B/C will be available to you for information.

Very truly yours,

THE ARCHITECTS COLLABORATIVE, Inc.

Herman B. Zinter

cc: R. Dickler C. Hewitt
 P. Maupin R. James
 E. Kogl

Encl.
HBZ:ld

ITEM

ACTION REQUIRED

3. Mosler estimated that all shop drawings can be completed in 6 to 8 weeks, but preparation (and approval) can be phased to advance installation in certain areas. This would expedite installation of the integrated ceiling, particularly on Level 1.

4. Alternative arrangements for stations in Mayo Hospital on Levels 1 and 2 were discussed with regard to either retaining the Blood Bank Laboratory in its present location or relocating the facility to provide more room for a materials transport station. It was requested that the bidder indicate the difference in station configurations and system installation costs for the two options.

5. Mosler recommended that the Supervisory Panel be located at Station 8 (Medical Records), which operates 24 hours and includes the system reject mechanism, and indicated that costs for low voltage wiring would be reduced with the panel installed in a central location.

TAC will prepare addendum.

6. In reviewing Section 14700, Technical Specifications, Mosler indicated that the following items are not standard features of the system:

TAC will prepare addendum to allow qualifications.

Paragraph 2.1, Item I: The container is not sterilizable by steam.

Mosler will identify qualifications in letter with bid.

Paragraph 2.1, Item J: A weight sensing device is not available. A line can be applied to the interior of the carrier to indicate a volume limit for contents.

Paragraph 2.3, Item E (also Paragraph 2.5, Item A): Tracks and switches are to be rigid. Shock and vibration absorbers are not required to control acoustics.

Paragraph 2.4, Item G: Containers are detachable, but required special tools.

Paragraph 2.4, Item K: Container lid is not spring-balanced to remain in place at any open position. A lanyard is provided to hold it in place when fully opened.

ITEM

ACTION REQUIRED

Paragraph 2.4, Item O: A removable and easily interchangeable gimbal device is not presently available.

Mosler will verify with manufacturing research and development.

Paragraph 2.7, Item M: Voltage meter is not standard, but can be included.

Paragraph 2.10, Item A: Smoke detection equipment in conjunction with fire damper is not provided by System Contractor.

cc: All present
HSAE



THE ARCHITECTS COLLABORATIVE INC.

JEAN B. FLETCHER 1945 1965
WALTER GROPIUS 1945 1969
NORMAN FLETCHER
JOHN C. HARKNESS
SARAH P. HARKNESS
LOUIS A. McMILLEN

5 November 1976

RICHARD BROOKER
ALEX CVIJANOVIĆ
HERBERT GALLAGHER
WILLIAM J. GEDDIS
ROLAND KLUPER
PETER W. MORTON
H. MORSE PAYNE
ERNEST L. BIRDSALL
TREASURER

Mr. Lester Garb, NE Area Manager
Mosler Airmatic Systems Division
40 West 40th Street
New York, NY 10018

ROBERT F. CRANE
HOWARD ELKUS
JOHN HAYES
JOSEPH HOSKINS

Re: University of Minnesota
Health Sciences Expansion
Unit B/C Materials Transport System
TAC Job No. 75046

GAZI AHMED
KENDALL P. BATES
JAMES BURLAGE
SERGE CVIJANOVIĆ
ROYSTON DALEY
GREGORY DOWNES
ALLISON GOODWIN
THOMAS LARSON
RALPH MONTGOMERY
PERRY NEUBAUER
LEONARD NOTKIN
MICHAEL PRODANOU
WALTER ROSENFELD
RICHARD SABIN
DAVID SHEFFIELD
EDMUND SUMMERSBY
MALCOLM TICKNOR
ROBERT TURNER
ERNEST WRIGHT
LAURENCE ZUELKE

Dear Les:

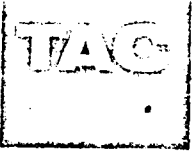
At the pre-bid conference in Minneapolis on 29 October 1976, we discussed alternatives in developing stations in Mayo Hospital on Levels 1 and 2. One alternative, which is shown on Drawing MTS-4, assumes that Room D208 (Blood Bank Laboratory) and Room D206 (Office) will remain in present locations on Level 2. From field inspections, we know that this plan will require the relocation of a major duct in the ceiling strata of Level 1 to provide a clear pathway for the station configurations shown.

A second alternative is to relocate the Laboratory and Office and provide more space for system equipment, carts, work surfaces, and circulation at the Materials Transport Station and Record Lift at Level 2. Acceptance of this alternative depends on the improvement in station design, and relative installation costs and change order costs.

We would appreciate receiving your specific comments regarding optimum station layout and estimated costs for both of the options to assist in the resolution of the materials transport system design.

To review the details of your Bid and proposals for the stations in Mayo Hospital, we would like to schedule a meeting with you at the University on Wednesday, 17 November 1976, at 8:00 a.m. in Room 4110, Powell Hall. This follows the day of bid opening as modified by Addendum No. 1, which was mailed under separate cover.

Table with columns for dates and rows for COPIES, with handwritten 'X' marks and a vertical label 'FILE' on the right side.



THE ARCHITECTS COLLABORATIVE INC.

Re: University of Minnesota
Unit B/C Materials Transport System
5 November 1976
Page 2

Please let me know if this arrangement is satisfactory and whether or not you have any questions about the subject stations.

Very truly yours,

THE ARCHITECTS COLLABORATIVE, Inc.

Herman B. Zinter

- cc: Messrs: Hewitt
- R. James
- E. Kogl
- P. Maupin
- R. Dickler
- Ms. N. Omundson
- HSAE

(8) MATERIALS TRANSPORT SYSTEM BID (MTS)

BASE BID MTS: Bidder agrees to perform all of the Materials Transport System Construction Work for the sum of FIVE HUNDRED THIRTY NINE THOUSAND

NINE HUNDRED THIRTY ONE DOLLARS \$ 539,931.00

ALTERNATE MTS-1: Omit Station 17 (Dental), Floor 7, Unit B/C

DEDUCT EIGHT HOUNDAND SIX HUNDRED TEN DOLLARS \$8,610.00

ALTERNATE MTS-2: Omit Station 16 (Psychiatry), Floor 6, Unit B/C . . .

DEDUCT EIGHT THOUSAND SIX HUNDRED TEN DOLLARS \$8,610.00

ALTERNATE MTS-3: Omit Station 15 (Neurology), Floor 5, Unit B/C . . .

DEDUCT EIGHT THOUSAND SIX HUNDRED TEN DOLLARS \$8,610.00

ALTERNATE MTS-4: Omit Station 7 (Ambulatory Surgery), Floor 1, Unit B/C .

NINE THOUSAND ONE HUNDRED

DEDUCT FORTY SIX DOLLARS \$9,146.00

ALTERNATE MTS-5: Omit Station 10 (Business Office/Admissions), Floor 2,

Unit B/C DEDUCT FIVE THOUSAND EIGHT HUNDRED ELEVEN DOLLARS

----- \$5,811.00

ALTERNATE MTS-6: Omit Station 20 (Mayo 1), Floor 1, Mayo Hospital) . . .

TWENTY EIGHT THOUSAND

DEDUCT NINE HUNDRED TWENTY FIVE DOLLARS \$ 28,925.00

ALTERNATE MTS-7: Omit Station 21 (Mayo 2), Floor 2, Mayo Hospital,

including all track, switches, hardware and monitoring connecting to main

line pathway in Unit B/C. . . . DEDUCT TWENTY SEVEN THOUSAND ONE HUNDRED

EIGHTEEN DOLLARS----- \$ 27,118.00

- (9) Unit Prices: Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those on which the Bid is based, by order or approval of the Architect/Engineer, the undersigned agrees that the following supplemental Unit Prices will be the basis of payment to him or credit to the Owner for such addition, increase or decrease in the work. Unit Prices given shall represent the exact net amount per unit to be paid the Contractor (in the case of additions or increases) or to be the basis for refund to the Owner (in the case of decreases). The Unit Prices shall include associated supervisory monitoring and installation. No additional adjustment will be allowed for overhead, profit, insurance, compensation insurance or other direct or indirect expenses. The Owner shall have the right to reject any or all proposed Unit Prices at any time prior to signing the Agreement, in which case the cost of extra work shall be as determined by one of the other methods set forth for changes in the work, in the General Conditions. Unit Prices given herein shall be for additional work only. Decreased work at Unit Prices shall be at the "Add" price less fifteen percent (15%).

.14701, as applicable:

- (a) Track Components, including hangers, anchors, isolators, clamps, splices, struts, power and logic rails, gear, racks and fasteners, per each track length:

Straight Track, Horizontal, 10' Length \$447.00 each
Straight Track, Vertical, 10' Length \$456.00 each

Outside Bend, 90 Degrees, 27" Radius \$481.00 each
Inside Bend, 90 Degrees, 27" Radius \$481.00 each
Outside Bend, 45 Degrees, 27" Radius \$428.00 each
Inside Bend, 45 Degrees, 27" Radius \$428.00 each
Vertical Offset, 22-1/2 Degree Bends \$841.00 each

Curve, 90 Degrees, 34" Radius - (All curves provided are 24" radius) \$ NA
Curve, 45 Degrees, 34" Radius 24" radius) \$ NA
Curve, 22-1/2 Degrees, 34" Radius \$ NA
Horizontal Offset, 22-1/2 Degree Curves \$ NA

Curve, 90 Degrees, 24" Radius \$441.00 each
Curve, 45 Degrees, 24" Radius \$338.00 each
Curve, 22-1/2 Degrees, 24" Radius \$283.00 each
Horizontal Offset, 22-1/2 Degree Curves, 6-1/4" Filler \$583.00 each

- (b) Station components, including appropriate 5'-0" length(s) of straight track, supports, controls and directory, per assembly:

Re-Entry Station Assembly, 3 Car \$2,363.00 each
Exit/Entry Station Assembly, 3 Car \$2,156.00 each
Transfer Station Assembly, 7 Car - (Excludes single switch) \$3,292.00 each

- (c) Switching units, including controls, read plates, supports and hardware, per each unit:

Switch, Re-Entry \$4,979.00 each
Switch, Exit/Entry \$4,979.00 each
Switch, Transfer \$5,803.00 each
Switch, Single \$4,979.00 each

- (d) Delivery vehicles, including container with hinged cover assembly, keylock, electrical latch interlock, touch stop control, motor, chassis, and thermal overload device, per car:

Car, 20-lb. Capacity Container \$1,250.00 each
Car, Vacuum, 20-lb. Capacity Container \$1,759.00 each

- (e) Delivery vehicle inserts, including hardware, per each unit:

Removable Gimbal Device (2 Basket Capacity) \$ 30.00 each
Wire Basket (With Handle) \$ 54.00 each

- (f) Power monitors, including mounting brackets and electrical connections, per each module:

Multi-Power Module, 100 Amp \$3,238.00 each
Uni-Power Module, 25 Amp \$1,438.00 each

(g) Fire dampers, including release mechanisms and actuating devices, and air baffles, per each assembly:

Fire Damper Assembly, Class A (Single Track)	\$ 1,086.00 each
Fire Damper Assembly, Class A (Double Track)	\$ 1,284.00 each
Fire Damper Assembly, Vertical, Class B (Single Track)	\$ 550.00 each
Fire Damper Assembly, Vertical, Class B (Double Track)	\$ 671.00 each
Fire Damper Assembly, Horizontal, Class B (Single Track)	\$ 550.00 each
Fire Damper Assembly, Horizontal, Class B (Double Track)	\$ 671.00 each
Air Baffle Assembly, Single Track	\$ 166.00 each
Air Baffle Assembly, Double Track	\$ 230.00 each

(10) Bid Security: The Bidder submits the attached Bid Security in the form of a Certified Check, Cashier's Check or Bid Bond, in accordance with the Instructions To Bidders, drawn to the order of the Regents of the University of Minnesota. The Bidder acknowledges the Bid Security may be retained by the University as specified in the Instructions To Bidders and agrees if the Bidder defaults in executing the Contract within the time set forth, or in furnishing the Performance Bond as specified, the check will become the property of the University (or the Surety will pay the University in the amount of the bond) as liquidated damages for the delay and additional expense to the Owner caused thereby.

(11) Holding of Bids: The Bidder agrees this Bid shall be good and may not be withdrawn for forty five (45) calendar days after the scheduled time and date for receiving bids, except that Alternate Bids shall be good and the work omitted by any accepted alternate may be ordered reinstated by the University at any time up to one hundred twenty (120) calendar days after the scheduled time and date for receipt of bids.

(12) Acceptance of Bids: The Bidder understands the University reserves the right to accept any Bid it determines in its best interest, to accept Alternates as stated in the Instructions To Bidders, and to reject any and all Bids. Upon receipt of notice of award of a Contract (acceptance of this Bid) the Bidder will execute the Agreement, in the specified form, within 10 regular work days thereafter and to deliver a Contractor's Performance Bond, in the stipulated Form, in accordance with Article 8 of the Instructions To Bidders and Paragraph 7.5 of the General Conditions.

(13) Informalities: It is understood by the Bidder the University reserves the right to waive informalities in bids received and minor discrepancies in bidding procedure.

(14) Information about Bidder:

If a Corporation, incorporated in the State of NEW YORK

Qualified to conduct business in the State of Minnesota? YES

If a Partnership, full names of all Partners are _____

(15) Schedule:

Engineering prerequisite to beginning of installation can be complete on:

60 Calendar Days After Notice to Proceed

Shop Drawings can be complete and ready for submittal on:

120 Calendar Days After Notice To Proceed

Delivery of materials to the field for installation can begin on:

30 Calendar Days After Notice To Proceed

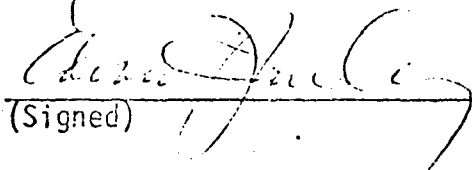
Installation in the field can begin on:

10 Calendar Days After Receipt of First Shop Drawing Approval

(16) Certification for Equal Opportunity
and Affirmative Action:

(Must Be Signed By Bidder)

The bidder hereby certifies that all of the specified requirements for Equal Opportunity and Affirmative Action, General Conditions, Article 15, will be fully complied with, as stated, for this Project.



Vice President and General Manager
, Title

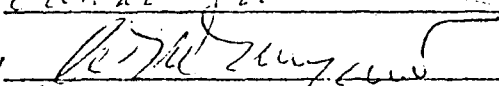
(17) Respectfully submitted:

Correct and full name of Bidder

Name AIRMATIC AND ELECTRONIC SYSTEMS DIVISION OF THE MOSLER SAFE COMPANY

Address 415 HAMBURG TURNPIKE, WAYNE, NEW JERSEY 07470

By  Title Vice President and General Manager

By  Title Director of Marketing

(Affix Corporate Seal if bid is by a corporation)

Date November 12, 1976

Mosler Airmatic & Electronic Systems Division
415 Hamburg Turnpike
Wayne, New Jersey 07470
Telephone: 201-881-4000

Writer's Direct Dial:

(201) 881-

Mosler

An American-Standard Company

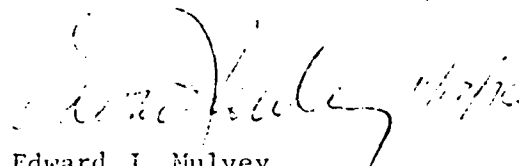
November 12, 1976

The Regents of the University
of Minnesota
Minneapolis, Minnesota

PROPOSAL FOR MATERIALS TRANSPORT SYSTEM

Clarifications:

1. Our proposal is based on a guaranteed right-a-way for the Telelift System according to Mosler Airmatic Systems Division Drawings P-20674-1, dated November 12, 1976, with the removal of all obstructions and interferences by others, whether specified or not specified on the drawings.
2. Section 14, see paragraph 2.10.A, Line 4 - Delete smoke detectors.
3. Section 14, see paragraph 2.1.J - Weight sensing is not available.
4. Section 14, see paragraph 2.3.E, Line 2 - Vibration eliminators are not included as they are detrimental to system operation.
5. Section 14, see paragraph 1.3.E, Line 3 - Should read 208 volt, single phase, 30 amp primary.
6. Section 14, see paragraph 1.3 - Clarification - Removal and replacement of ceilings and ceiling obstructions to be by others. Also, any required soffitts are by others.
7. See paragraph 2.1.I - Eliminate the words "steam or".
8. See paragraph 2.2.E - According to pre-bid conference, second sentence is to be deleted. Car will make continuing attempts to reach the indicated station.
9. If both alternates 6 and 7 are selected, the track run from B/C building to Mayo would also be eliminated.



Edward J. Mulvey
Vice President and General Manager

THE ARCHITECTS COLLABORATIVE Inc.
HEALTH SCIENCES ARCHITECTS AND ENGINEERS, Inc.

UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION

MEETING NOTES

DATE: 17 November 1976

TAC JOB: 75046, Unit B/C Materials Transport System (MTS)

SUBJECT: Bid, Mosler ("Telelift" System)

PLACE: Room 4112, Powell Hall

NOTES BY: Herman Zinter

PRESENT: Charles Martin, Lester Garb, Jack Kolb (Mosler)
Robert Dickler, Nancy Omundson, Greg Kujawa, Bob Swanson, Robert James,
Paul Maupin, (U/Minn)
John Scott, Herman Zinter (TAC/HSAE)

The purpose of the meeting was to review assumptions and qualifications contained in the bid of the Mosler Safe Company, Airmatic and Electronic Systems Division, for the Material Transport System in Unit B/C. The following items were discussed:

ITEM

ACTION REQUIRED

1. To complete information required by the Instruction to Bidders, Mosler submitted 5 sets of the following drawings, dated 12 November 1976:

<u>Dwg. No.</u>	<u>Sheet</u>	<u>Description</u>
P-20674	1	Riser Diagram
P-20674-1	2	1st Floor Layout
P-20674-1	3	2nd Floor Stations
P-20674-1	4	Unit B/C & Mayo

2. Mosler confirmed that the bid price reflects the provisions of Addendum 2, the content of which was transmitted during a telephone conversation prior to submittal of bid.

Mosler will send letter to R. James acknowledging receipt of Addendum 2.

3. Reference was made to the list of clarifications by Mosler, dated 12 November 1976, and attached to the bid:

ITEM

ACTION REQUIRED

- a. Noting that the MTS pathway (as shown on the contract drawings for Unit B/C) contains other mechanical services, Mosler indicated that the bid assumes the removal of all obstructions, by others. In addition to notes on the drawings, Mosler will assist in field inspections to identify specific obstructions and/or alternative pathway locations.
 - b. The configuration of station layout in the Mayo building, which is preferred by Mosler, is shown on sheet no. 4, detail plans 8 and 9. The alternative concept shown is of equal cost.
 - c. The gimbal device to be furnished by Mosler for transporting specimens and containers in the self-propelled cars, will be as specified; i.e. transferrable assemblies which can be inserted in any of the system cars.
4. With regard to project schedules, Mosler responded as follows:
- a. The engineering and shop drawing phase would begin upon receipt of a letter of intent and require approximately 6 - 8 weeks to complete.
 - b. Drawings will be prepared for layout and stations on Floor 1 and 2 (Unit B/C), Floors 3 through 9 and the Mayo Link, in that order.

UNIVERSITY OF MINNESOTA
HEALTH SCIENCES EXPANSION

MEETING NOTES

DATE: 18 November 1976

TAC JOB: 75046, Unit B/C Materials Transport System (MTS)

SUBJECT: Selection of System Equipment

PLACE: Room 4112, Powell Hall

NOTES BY: Herman Zinter

PRESENT: Tom Jones, Robert Dickler, Greg Kujawa, Nancy Omundson, Paul Maupin,
Eugene Kogl, Jack Lorence, John Roby (U/Minn)
John Scott, Herman Zinter (TAC/HSAE)

The purpose of the meeting was to review bids received for the Materials Transport System in Unit B/C and to establish procedures for the final selection of system equipment. The following items were discussed:

ITEM

ACTION REQUIRED

1. Reference was made to meetings with vendors on the preceding day, 17 November 1976, to clarify aspects of the bid proposals.
2. TAC presented information contained on the attached summaries which compare specific items of system function, procurement, installation, maintenance, and cost as contained in (or omitted from) in the final bid proposals, qualifications, or drawings.
 - a. Based on job conditions in Unit B/C, and on required changes in the pathway configuration to accommodate either of the proposed systems as indicated on the vendor's drawings, the estimated change order costs in Unit B/C were increased by 12 percent for the Telelift and by 18 percent for the Distributor system.
 - b. The estimates of total MTS project costs, as included in "Part 3: Summary of Proposals", dated 28 June 76, were modified to include bid costs of supervision and contingency for installation of the basic system. The revised tabulations are attached as pages 6.15a, 6.16a and 6.17a.

ITEM

ACTION REQUIRED

3. It was agreed that MTS stations in shell space would be omitted according to the following schedule of deduct alternates:

Alternate Number	Station Number	Colemen Bid	Mosler Bid
MTS 1	17 Shell	\$10,500	\$ 8,610
2	16 Shell	10,500	8,610
3	15 Shell	10,500	8,610
4	7	--	--
5	10	--	--
6	20	--	--
7	21	--	--
Total		\$31,500	\$25,830
NET BID PRICE		\$536,340	\$514,101
DIFFERENCE		+ \$ 22,239	

4. It was agreed that the Telelift system best satisfies the established design criteria for procurement, operation and cost. Assuming that a review by TAC of forthcoming clarifications from vendors will not significantly modify the summary information and conclusions, a letter of intent will be issued to Mosler for purchase of material before an announced price increase, effective 1 December 76.

U/Minn (Purchasing) will issue a letter to Mosler upon notification from the Hospital through HSPO.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF CRITERIA FOR SYSTEM SELECTION

The following summary is based on an evaluation of final bid proposals by vendors, including separate comments of clarification or qualification attached to the bids, and plans of pathway and station configuration:

Ada-Bec
DISTRIBUTOR

Mosler
TELELIFT

Function

Carrier can be sterilized.

Car cannot be sterilized.

Procurement

Project coordination to date by vendor has been incomplete.

Acceptance of (high) bid will require Regent's approval.

More time will be required to secure U/M approval of Joint Venture.

Installation

Framing and slab openings on Floors 3-9 need to be modified for system riser.

Casework at all stations will need to be modified.

Maintenance

Belt or pathway malfunction may cause shut down of complete zone (or system).

Components have UL approval.

System has UL approval

Costs

Net adjustments to bid will increase bid price as a result of clarification of specifications.

Total non-adjusted bid price is \$27,909 lower than other bid.

Change order costs to modify structure and casework are expected to be higher.

Total project costs, based on lower change order costs, is estimated to be \$110,206 lower than other bid.

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF PROJECT COSTS (REVISED)

Total Building Costs

The following summaries combine the cost estimates for the procurement and installation of system hardware as contained in the preliminary and final bid proposals by vendors and the related change order modifications and construction work by the owner to indicate the total building costs for the systems:

	Preliminary (19 Apr 76)	Final Bid (12 Nov 76)		
	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Ada-Bec DISTRIBUTOR	Mosler TELELIFT
Vendor Proposals:				
System in Unit B/C	\$ 425,000	\$ 480,291	\$ 523,440	\$ 483,880
System in Mayo	65,000	66,091	44,400	56,043
Total Estimate	<u>\$ 490,000</u>	<u>\$ 546,382</u>	<u>\$ 567,840</u>	<u>\$ 539,923</u>
Change Orders:				
System in Unit B/C	\$ 154,800	\$ 99,700	\$ 183,204**	\$ 111,664*
System in Mayo	53,000	53,000	75,000	75,000
Total Estimate	<u>\$ 207,800</u>	<u>\$ 152,700</u>	<u>\$ 258,204</u>	<u>\$ 186,664</u>
Total System:				
Vendor Proposals	\$ 490,000	\$ 546,382	\$ 567,840	\$ 539,931
Change Orders	207,800	152,700	258,204	186,664
Total	<u>\$ 697,800</u>	<u>\$ 699,082</u>	<u>\$ 826,044</u>	<u>\$ 726,587</u>

The following summaries indicate the separate building costs of the non-scheduled materials transport system in Unit B/C and Mayo Hospital:

	Preliminary (19 Apr 76)	Final Bid (12 Nov 76)		
	Ada-Bec DISTRIBUTOR	Mosler TELELIFT	Ada-Bec DISTRIBUTOR	Mosler TELELIFT
Unit B/C:				
Vendor Proposals	\$ 425,000	\$ 480,291	\$ 523,440	\$ 483,880
Change Orders	154,800	99,700	183,204**	111,664*
Total	<u>\$ 579,800</u>	<u>\$ 579,991</u>	<u>\$ 706,644</u>	<u>\$ 595,544</u>
Mayo Hospital:				
Vendor Proposals	\$ 65,000	\$ 66,091	\$ 44,400	\$ 56,043
Change Orders	53,000	53,000	75,000	75,000
Total	<u>\$ 118,000</u>	<u>\$ 119,091</u>	<u>\$ 119,400</u>	<u>\$ 131,043</u>

*estimated 12 percent increase for escalation

**estimated 18 percent increase for escalation

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF PROJECT COSTS (REVISED)

Assuming the scope of redesign and change order work as discussed in previous sections, the estimated non-building costs are tabulated as follows:

	Preliminary	(19 Apr 76)	Final Bid	(12 Nov 76)
	Ada-Bec	Mosler	Ada-Bec	Mosler
	<u>DISTRIBUTOR</u>	<u>TELELIFT</u>	<u>DISTRIBUTOR</u>	<u>TELELIFT</u>
BASIC SERVICES (A/E):				
Summary of Assumptions				
Instructions to Vendors				
Site Visits				
Summary of Vendor Proposals *	\$ 51,450	\$ 51,450	\$ 51,450	\$ 51,450
Bid Documents and Award	<u>6,000</u>	<u>6,000</u>	<u>6,000</u>	<u>6,000</u>
Unit B/C Change Orders (7%)	\$ 10,836	\$ 6,979	\$ 12,824	\$ 7,817
System in Mayo Hospital (7%)	3,710	3,710	11,250*	11,250*
TOTAL	<u>\$ 72,086</u>	<u>\$ 68,229</u>	<u>\$ 81,524</u>	<u>\$ 76,517</u>
REIMBURSABLES (A/E):				
Travel Expenses				
Consultants				
Printing and Telephone				
TOTAL	<u>\$ 16,600</u>	<u>\$ 16,600</u>	<u>\$ 17,000</u>	<u>\$ 17,000</u>
SUPERVISION (U/M):				
Unit B/C Change Orders (1 1/4%)	\$ 1,935	\$ 1,246	\$ 2,289	\$ 1,396
System in Mayo Hospital (1 1/4%)	662	662	938	938
System Bid Costs (1 1/4%)	6,125	6,830	7,098	6,749
TOTAL	<u>\$ 8,722</u>	<u>\$ 8,738</u>	<u>\$ 10,325</u>	<u>\$ 9,083</u>
CONTINGENCY (U/M):				
Unit B/C Change Orders (5%)	\$ 7,740	\$ 4,985	\$ 9,160	\$ 5,584
System in Mayo Hospital (5%)	2,650	2,650	3,750	3,750
System Bid Costs (5%)	24,500	27,319	28,390	26,996
TOTAL	<u>\$ 34,890</u>	<u>\$ 34,954</u>	<u>\$ 41,300</u>	<u>\$ 36,330</u>
Administration Review (U/M):				
Development of Assumptions				
Site Visits				
Review				
Total	_____	_____	_____	_____
Initial Training (U/M):				
Operation of System				
Maintenance of System				
TOTAL	_____	_____	_____	_____

* services through completed phase 25 June 1976

** based on 15 percent of estimated change order costs

UNIT B/C NON-SCHEDULED
MATERIALS TRANSPORT SYSTEM

SUMMARY OF PROJECT COSTS (REVISED)

Summary of Project Costs

The following figures combine the estimated building and non-building costs exclusive of Hospital administrative and training expenses to summarize the total project costs:

	Preliminary	(19 Apr 76)	Final Bid	(12 Nov 76)
	<u>Ada-Bec</u> <u>DISTRIBUTOR</u>	<u>Mosler</u> <u>TELELIFT</u>	<u>Ada-Bec</u> <u>DISTRIBUTOR</u>	<u>Mosler</u> <u>TELELIFT</u>
BUILDING COSTS:				
Vendor Proposals	\$ 490,000	\$ 546,382	\$ 567,840	\$ 539,923
Change Orders	207,800	152,700	258,204	186,664
NON-BUILDING COSTS:				
Basic Services (A/E)	\$ 72,086	\$ 68,229	\$ 81,524	\$ 77,000
Reimbursables (A/E)	16,600	16,600	17,000	17,000
Supervision (U/M)	\$ 8,722	\$ 8,738	\$ 10,325	\$ 9,100
Contingency (U/M)	34,890	34,954	41,300	36,300
Administrative Review (U/M)	-	-	-	-
Initial Training (U/M)	-	-	-	-
TOTAL	\$ 830,098	\$ 827,603	\$ 976,193	\$ 865,987

Nov. 24, 1976

Airmatic and Electronic Systems
Division of The Mosler Safe Company
415 Hamberg Turnpike
Wayne, New Jersey 07470

Gentlemen:

This is to advise you of our intent to enter into
a contract with you for:

Installation of a Materials Transport System
in Health Sciences Unit B/C, Minn. -18 (HP)
located on the University of Minnesota,
Minneapolis Campus, Minneapolis, Minnesota,
in accordance with the plans and specifications
prepared by The Architects Collaborative and
Health Sciences Architects and Engineers dated
20 October 1976, and Addendum No.'s 1 and 2 to
the plans and specifications on which bids were
received at 10:00 A. M. 10 November 1976, by
Robert D. James, Purchasing Agent for the
University of Minnesota.

BASE BID: \$539,931.00
FIVE HUNDRED THIRTY NINE THOUSAND NINE HUNDRED
THIRTY ONE DOLLARS.

Deduct the following alternates:

Alternate #1 - Omit Station 17 (Dental) Floor 7,
Unit B/C DEDUCT \$8,610.00
EIGHT THOUSAND SIX HUNDRED TEN DOLLARS.

Alternate #2 - Omit Station 16 (Psychiatry)
Floor 6, Unit B/C DEDUCT \$8,610.00
EIGHT THOUSAND SIX HUNDRED TEN DOLLARS.

Alternate #3 - Omit Station 15 (Neurology)
Floor 5, Unit B/C DEDUCT \$8,610.00
EIGHT THOUSAND SIX HUNDRED TEN DOLLARS.

See page 2

Net Bid: \$514,101.00
FIVE HUNDRED FOURTEEN THOUSAND ONE HUNDRED ONE DOLLARS.

BOND REQUIRED; 10% WITHHOLDING; INSURANCE AS PER SPECIFICATIONS; COMPLETION DATE: Substantial completion shall be accomplished on or before October 20, 1977. Final completion shall be within 45 days after substantial completion.

As soon as formal documents are prepared, they will be forwarded to you; however, you may use this letter as your authority to proceed with this work.

Sincerely,

Robert D. James,
Dir of Purchasing and Stores

cc: Physical Planning
Lil Williams
Leo Young
Architects Collaborative

rdj/s



UNIVERSITY OF MINNESOTA
TWIN CITIES

Health Sciences Planning Office
Physical Planning
Box 75 Powell Hall
4103 Powell Hall
Minneapolis, Minnesota 55455
(612) 373-8981

December 2, 1976

Mr. Joseph E. Coleman
J. E. Coleman Company
342 Madison Avenue
New York, New York 10017

SUBJECT: University of Minnesota
Health Science Expansion
Unit B/C
Non-Scheduled Materials Transport System

Dear Mr. Coleman:

Thank you for your bid proposal for the above subject portion of the Unit B/C project. We have reviewed your response and wish to inform you we have selected another vendor.

Yours truly,



Paul J. Nauph
Health Sciences Planning Coordinator
Health Sciences Planning Office

PJM:rm

cc: Clinton Hewitt
Eugene Kogl
Robert Dickler
Robert James
The Architects Collaborative
Hilland Associates, Ltd.

RECEIVED
DEC 6 1976
THE ARCHITECTS COLLABORATIVE INC.

U. OF MINN.
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