



Minot State UNIVERSITY

Plant Services

September 21, 2010

"The attached information is part of a larger complete engineering report on the proposed geothermal project at Minot State University that was prepared by MEP Associates. A complete copy of the MEP engineer's report is available electronically from Minot State University by contacting the office of Roger E. Kluck, P.E.-Assistant Vice President for Facilities Management."

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**Minot State
UNIVERSITY**

Geothermal System Conversion

Submitted by:

MEP Associates, LLC



20 September 2010
(revised)

engineers | consultants | commissioning

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SUMMARY

MISU currently has a \$2.5 million legislative appropriation plus an additional \$2 million pending from the ARRA funds through the North Dakota Department of Commerce. Phase 1 of the Geothermal System Conversion Project is based on a \$4.5 million budget from these funding sources.

Phase 2 of the project is budgeted at \$5 million budget which will be funded through state appropriations in late spring/early summer of 2011.

Phase 3 of the project is budgeted at \$7 million consisting of \$5 million from legislative appropriation, \$1 million from local funds and \$1 million from a low-interest loan funded from energy savings as a result of the project.

MEP Associates has developed a construction phasing plan based on the currently available and projected funding. Phase 1 of construction, which includes the North Well Field, Swain Hall, G.B. Olson, the Dome and the Wellness Center Phase 1 has been presented in detail in the Geothermal System Conversion Design Proposal Overview dated 13 September 2010. This report is included in Appendix D of this document.

Phasing Plan

- Phase 1: Install 450 wells in the North Well Field and connect and convert the following buildings to the partial geothermal loop.

Swain Hall	G.B. Olson Library	Wellness Center Phase One
	Dome	

- Phase 2: Construct the SE and SW well fields and install the main geothermal loop throughout the campus. Connect and convert the following buildings to the main geothermal loop:

Moore Hall	Hartnett Hall
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- Phase 3: Convert and connect the following buildings to the geothermal system

Lura Manor	Administration	Memorial Hall
McCulloch Hall	Student Union	Cook Hall
Dakota Hall	Old Main	Pioneer Hall
Crane	Model Hall	

Table 1 and plan PH-1 (included in Appendix A) indicate the proposed construction phasing.

After completion of Phase 1, there will be four buildings converted to geothermal heating and cooling with resultant energy savings for those buildings. At the end of Phase 2, the total campus-wide

geothermal loop would be complete and two additional buildings will have been converted with additional energy savings. In Phase 3, eleven additional buildings would be converted to the geothermal system.

INTRODUCTION

This report presents design and construction phasing of the Geothermal Conversion Project for Minot State University. The proposed design and construction phasing options follow the latest projected sources of funding, as communicated by Minot State University, as of the publication of this document.

Overview

MEP Associates is teaming with EAPC on the design of the geothermal installation for the Minot State University campus. MEP Associates was asked to plan and present phasing options for the entire campus conversion based on the following anticipated funding schedule:

- Phase 1: \$4.5 million
- Phase 2: \$5.0 million available Spring of 2011
- Phase 3: \$7.0 million available Spring of 2012

MEP Associates is presenting a design and construction phasing plan which meets the phased budgeting described above.

The scope of Phase 1 includes the North Well Field, partial campus distribution piping and the conversion and connections for the Wellness Center Phase 1, Swain Hall, GB Olson Library and the Dome. Phase 1 of the geothermal conversion project will ensure that sufficient system installation is place to coincide with the fall 2011 completion of the Wellness Center Phase 1.

The Phase 1 North Well Field will utilize the area under and adjacent to Allen Field. Two test wells will be drilled to determine the geological makeup of the ground under the North Well Field as well as to determine the thermal conductivity of the ground. Drawing PH-1, included in Appendix A indicates the locations of the Phase 1 well field, the locations for the test wells and areas identified for Phase 2 and 3 well fields.

Phase 1 includes the conversion and connection of Swain Hall, Wellness Center Phase 1, GB Olson Library and the Dome and the installation of 450 wells in the North Well field, under and adjacent to Allen Field. The piping design will allow for re-use of the Phase 1 loop piping as the injection piping for the North Well Field in subsequent phases. The construction cost for Phase 1 of the project is \$4.5 million and is presented in Table 1.

CONSTRUCTION PHASING

Construction Phase 1 will include the North Well Field, partial campus distribution piping, and the conversion and connections for the Wellness Center Phase 1, Swain Hall, GB Olson Library and the Dome.

Construction Phase 2 will complete the well and piping installation on campus. Wells in the SE and SW parking areas would be installed. The partial geothermal loop installed in Phase 1 would be connected to the main distribution loop. The design of the partial geothermal loop installed in Phase 1 would allow it to become part of the main distribution loop. Pumps for the main distribution loop would be installed and the campus wide geothermal piping loop would be operational at the end of Phase 2.

The well fields in the south part of the campus are to be located in parking areas in the vicinity of the Power House and Model Hall. MEP understands that some of the parking areas in the southwest portion of the campus are scheduled for re-paving. MEP will work closely with MiSU to determine the optimum well field locations in accordance with planned and funded parking lot repaving on campus.

Phase 2 would also include the conversion and connection of the Hartnett Hall and Moore Hall which would provide for additional energy savings.

At the completion of Phase 2, the parking areas disturbed by the well fields and underground piping would be restored. Disruption to the site in Phase 3 would be limited to the piping connections from the geothermal mains to each building. Connections would be located in Phase 2 to minimize disruption of paved areas in Phase 3.

Construction Phase 3 will include conversions of eleven buildings and their connections to the campus-wide geothermal loop installed in Phase 2. There would be flexibility in the scheduling of the conversions and connections of the buildings because the campus wide geothermal loop would be complete and in operation. If scheduling for Phase 3 were to be modified or extended, buildings could be converted and connected as the revised schedules allow.

Disruption to the site in Phase 3 would be limited to the piping trench from the piping terminations installed in Phase 2 to the buildings themselves.

Appendix A graphically illustrates the Phases of work included in this project. Construction costs are presented in Table 1 of this document.

Table 1 - Construction Costs

CONSTRUCTION COSTS					
Work Area	Work Item Description	Cost per Work Item	Phase One	Phase Two	Phase Three
			\$4.5 million	\$5.0 million	\$7.0 million
Well Fields, Restoration, Piping and Pumps					
450	North Field Bore Holes	\$1,845,000	\$1,845,000		
225	SW Field Bore Holes	\$922,500		\$922,500	
225	SE Field Bore Holes	\$922,500		\$922,500	
	North Field Restoration	\$57,375	\$57,375		
	SW Field Restoration (n.i.c.)	\$0		\$0	
	SE Field Restoration (n.i.c.)	\$0		\$0	
	Main Loop Piping and Pumps	\$775,000		\$775,000	
	North Loop Piping and Pumps	\$184,300	\$184,300		
	SW Loop Piping and Pumps	\$118,500		\$118,500	
	SE Loop Piping and Pumps	\$127,500		\$127,500	
Bldg. Conversions					
	Lura Manor	\$456,400			\$456,400
	McCulloch Hall	\$425,300			\$425,300
	Cook Hall	\$475,900			\$475,900
	Administration	\$302,600			\$302,600
	Student Union	\$733,000			\$733,000
	Dakota Hall	\$541,300			\$541,300
	Memorial Hall	\$432,000			\$432,000
	Dome	\$709,000	\$709,000		
	Hartnett Hall	\$421,800		\$421,800	
	Swain Hall	\$93,400	\$93,400		
	Old Main	\$748,200			\$748,200
	Moore Hall	\$681,400		\$681,400	
	GB Olson Library	\$479,700	\$479,700		
	Pioneer Hall	\$427,500			\$427,500
	Crane Hall	\$390,900			\$390,900
	Model Hall	\$420,100			\$420,100
	Wellness Center	\$100,000	\$100,000		
Construction Cost		\$12,791,175	\$3,468,775	\$3,969,200	\$5,353,200
Contingency - 18%		\$2,302,412	\$624,380	\$714,456	\$963,576
Construction Including Contingency		\$15,093,587	\$4,093,155	\$4,683,656	\$6,316,776
Engineering Fees - 7.25%		\$1,094,285	\$296,754	\$339,565	\$457,966
Total Cost		\$16,187,872	\$4,389,908	\$5,023,221	\$6,774,742

EVALUATION AND DECISION

Construction is being phased to use the allocated funds as currently projected. MEP recommends the proposed plan for the following reasons:

- This plan would concentrate the majority of the disruptive Phase 2 site work into one summer construction season. Phase 3 would be primarily building conversions and connections.
- At the end of Phase 2, the campus-wide geothermal distribution loop and all well fields would be complete and functional.
- This plan would provide flexibility in scheduling building conversions and connections. In Phase 3, scheduling of buildings to be converted and connected would be very flexible; buildings could be connected in any order.

SCHEDULE

There are a number of areas that have been identified as time sensitive, both in current and planned construction. The known daily activities of the operations of the campus have been taken into consideration during the development of the schedule. One of the critical areas is the Wellness Center Phase I which has been identified as requiring an in service date of Fall 2011. The schedule for the completion of the geothermal conversion Phase 1 is set to coordinate with the in service date for the Wellness Center. The approach makes economic sense for the campus, as the geothermal system will eliminate the need for connection to the central steam system and the purchase and installation of heat rejection equipment (cooling tower).

Coordination between MEP and EAPC has begun. MEP will continue to advance the design process in order to achieve the Fall 2011 geothermal conversion Phase 1 in service date.

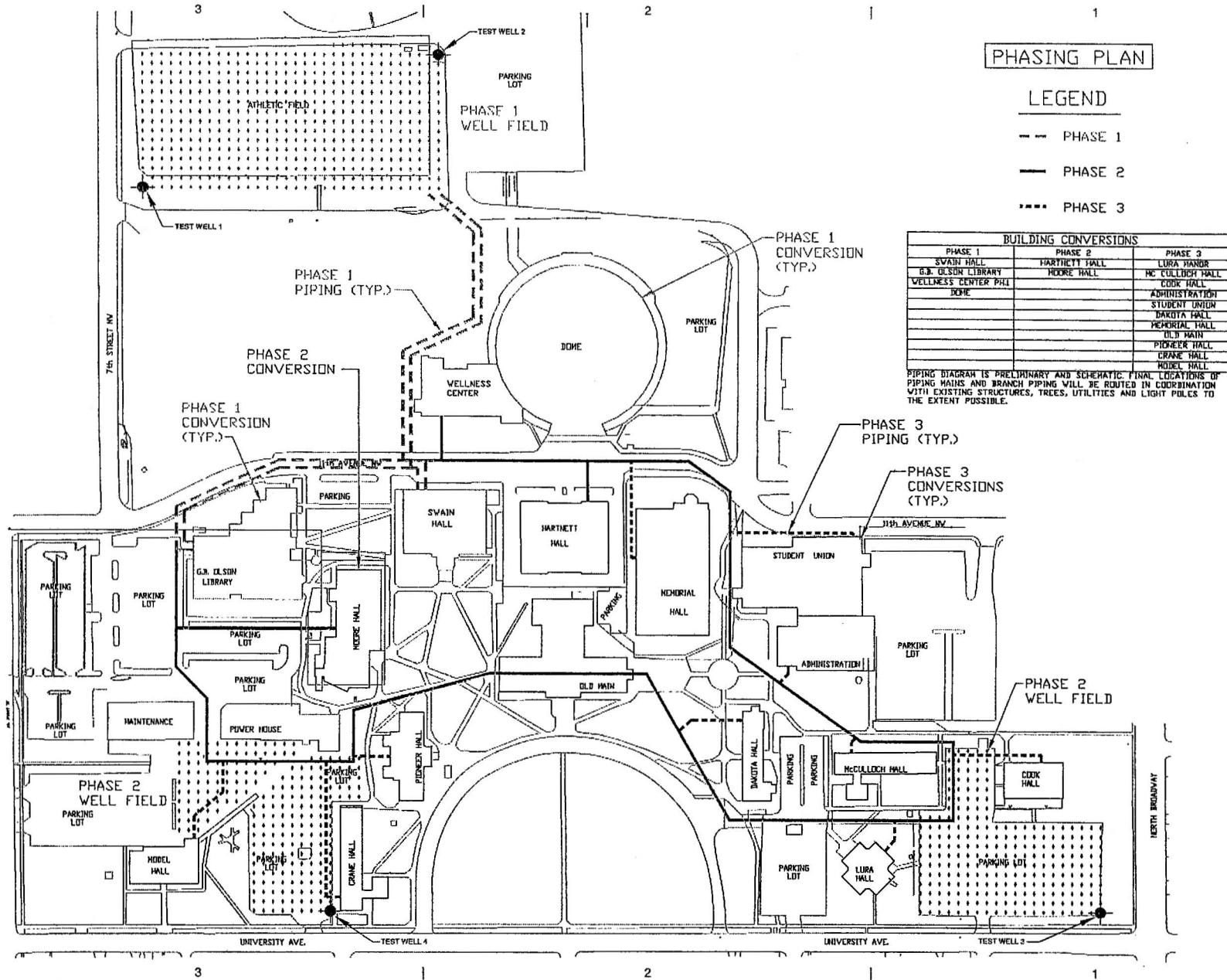
The Phasing Schedules, located in the Appendices B and C, are based upon the proposed phasing as described above.

MEP Associates will ensure that the final identified and agreed upon schedule will meet the overall operations considerations for the MiSU campus, including sensitivity to the required operations of the daily activities of the campus.

APPENDIX A

CONSTRUCTION PHASING PLAN

Drawing name: I:\(420) Minot State University\420.10.02 Geo Conver Phase 1\02-Design\Drawings\Working Documents\geofieldlayout.dwg Sep 20, 2010 11:42am



PHASING PLAN

LEGEND

- PHASE 1
- PHASE 2
- PHASE 3

BUILDING CONVERSIONS		
PHASE 1	PHASE 2	PHASE 3
SVAIN HALL	HARTNETT HALL	LURA HALL
G.J. OLSON LIBRARY	MOORE HALL	MC CULLOCH HALL
WELLNESS CENTER PH1		COOK HALL
DORE		ADMINISTRATION
		STUDENT UNION
		DAKOTA HALL
		MEMORIAL HALL
		OLD MAIN
		PIONEER HALL
		CRANE HALL
		MODEL HALL

PIPING DIAGRAM IS PRELIMINARY AND SCHEMATIC. FINAL LOCATIONS OF PIPING MAINS AND BRANCH PIPING WILL BE ROUTED IN COORDINATION WITH EXISTING STRUCTURES, TREES, UTILITIES AND LIGHT POLES TO THE EXTENT POSSIBLE.

PROJECT

MINOT STATE UNIVERSITY

GEOTHERMAL CONVERSION

MINOT, NORTH DAKOTA

PROJECT

DESCRIPTION

DATE

MARK

ISSUE

SL

IN CHARGE: DO

QA: JS

ISSUE: PHASING PLAN

DATE: 09.20.2010

ISSUE

PHASING PLAN

CONTENTS

PH-1

SHEET NUMBER

APPENDIX B

PHASING SCHEDULE OVERVIEW



University of North Dakota, September 16, 2010

REQUESTED ACTION

Authorize UND to seek Budget Section approval to utilize \$220,000 in unrestricted gift funds as local matching funds on the O'Kelly Hall renovation project authorized in 2007-09 per NDCC 15-10-12.3.

Background Information

The 2007-09 Executive Budget Recommendation included \$2.2 million in general funds for the O'Kelly Hall renovation project. The 2007 Legislative Assembly amended the funding to require a local match of \$220,000 (special funds). A copy of the project description follows this section.

UND originally utilized \$220,000 in asbestos settlement funds as the local match requirement, as the funds were used to address asbestos issues in the facility as part of the renovation project. The Performance Audit Report on University System Capital Projects identifies the fact that per NDCC 15-10-12.3 "... the source of any local matching funds required for state-funded or bonded projects must be funds raised and designated for the project or obtain approval to transfer institution or agency funds."

UND intends to utilize unrestricted gift funds, instead of asbestos funds, as the required \$220,000 local match; however, unrestricted gift funds do not fit the requirement (e.g. funds raised and designated for), therefore legislative or budget section approval is required.

Project Description - O'Kelly Hall / Ireland Laboratory Renovation - \$2,200,000

Located in the center of the UND campus, the O'Kelly/Ireland Hall facility remains a valuable instruction and research asset requiring significant space renovation to adequately support those functions. The project has been and remains a top priority for the institution, evidenced by the number of successful small-scale projects which have recovered unusable space and converted it into modern instructional areas.

Due to building code restrictions, no additional space renovations can be completed without significant improvements to the building's mechanical and electrical systems. This stems from a requirement to meet current codes once a percentage of floor space has been modernized. The code-required improvements include fire protection systems, accessibility improvements, and ventilation corrections. Because the budgets for small-scale projects cannot accommodate the building-wide mechanical and electrical upgrades, a major investment in those systems is required before any further progress is made.

The revised budget estimate of \$2,200,000 reflects a reduction in the scope of work from previous plans, but also an increase in system costs for mechanical and electrical work that includes fire protection systems, installation of HVAC components, and a new electrical service to the structure. UND will continue to seek alternative funding sources which can supplement the above requested appropriation for a more complete scope of work that includes space renovation.

The renovation project was completed June 15, 2010.

University of North Dakota
September 16, 2010

900: Facilities

Requested Action:

Request approval to proceed with the Bismarck Center for Family Medicine building project based on updated status. Status will also be reported to the Budget Section of the Legislature.

Background Information:

As planning for the new facility has progressed, the City of Bismarck, Medcenter One, St. Alexius, and the University of North Dakota, School of Medicine and Health Sciences have developed a remarkable degree of cooperation and synergy. The parties have formed an extraordinary consensus as to the optimal location and scope of the building, maximizing the value of the facility to the citizens of Bismarck and the surrounding area. Initially focused principally on the location of the building, planning has now evolved to a robust discussion regarding the concept of the building and its value to the community. Listed below are the specifics of different aspects of the project:

- **Location**—Agreement has been reached by all parties that a downtown location is optimal, and a site has been identified adjacent to both hospitals, making it ideal from the standpoint of faculty, staff, residents, students, and—most of all—patients. The proposed location is at the corner of Rosser Avenue and Seventh Street, a prime location in downtown Bismarck. Medcenter One Hospital is providing this property to UND at no cost through a negotiated land lease or other appropriate instrument. Because of the central location in this highly developed area, additional work will be required to make the property “build-ready,” because infrastructure, such as parking and electrical services, must be reconfigured.

Clinic patients will have ample parking immediately adjacent to the facility because of a cooperative effort by both hospitals and the City of Bismarck. As a result of the efforts described above, the Center for Family Medicine will be in a location with high visibility, easy access, and next door to our supporting partners.
- **Building Design**—Considerable planning has gone into the layout of the building, and plans are essentially complete for a 30,000-square-foot facility. All clinic functions will be on the first floor; support functions, including office space for the residency program as well as the Southwest Campus, will be on the second floor.
- **Budget**—Current plans continue to be well within the budget constraints established by the SBHE and the Legislature. Legislatively approved construction delivery methods have been selected that guarantee the clinic will be completed under budget.
- **Possibility of Building Expansion**—Medcenter One expressed interest in adding a third and a fourth floor to the building for additional educational space, including the

possibility of a 200-seat auditorium. Based on very recent conversations and letters of intent, construction of the third and fourth floors above the UND Center for Family Medicine will be completed by a developer. An agreement between the developer and Medcenter One will be executed governing the third floor space, which will be utilized by Medcenter One to further their educational mission. This use will complement the mission of the UND CFM. At this time, use/occupancy of the fourth floor (if constructed) is undefined with no existing commitment by Medcenter One. Medcenter One retains ownership of the land *under* the new Center and the developer will own the building space *above* the Center. This additional space is not considered to be an expansion of the UND-owned space, but instead, a practical effort to make use of valuable land in a highly developed area of downtown Bismarck. Medcenter One and related private parties will enter into a development agreement for construction of the additional space. The additional work will be wholly financed and managed by the developer separately from the UND project. The legal instrument that would best manage this partnership is currently being determined by the UND General Counsel's office, which will also review applicable policies and statutes to ascertain full compliance has been met. As the project moves forward, UND will include within the agreement between it and Medcenter One stipulations and conditions that protect the interests of UND while maintaining the good will already obtained from Medcenter One and St. Alexius Hospitals. This work will be accomplished in concert with the development agreement above so that all parties are aware and respectful of our mutual interests in a successful family medicine residency program.

- **Time Line**—The projected occupancy date is the third quarter of 2011. Medcenter One has made a commitment to proceed, and it is assumed at this time that all work will be completed concurrently or at least to the extent that work in progress on the Medcenter One portion of the facility will have no effect on the operation of the completed Center for Family Medicine.

Based on our understanding of existing statute and policy, and in consultation with legal counsel, we do not believe this is a change in project scope for UND and therefore does not require legislative authorization. Time is of the essence and if appropriate agreements cannot be worked out quickly, construction will need to proceed without the additional educational space. If our understanding of required authorizations is not correct, we would appreciate reviewing more accurate information so that decisions can be made as to how the project will proceed.

We are committed to full and open disclosure and dialogue with the State Board of Higher Education and the Legislature. We will continue to provide status updates over the life of the project.

Budget Section, September 2010

What sources of funds are considered institutional collections versus local funds, primarily as it relates to capital projects that are presented to the Budget Section for approval.

Definition and Examples of Institutional Collections and Local Funds

- Institutional collections--comprised of state appropriations and tuition income from credit activities.
 - Local funds--all other institutional funds, except for state appropriations, "credit" tuition income, grants and contracts and other restricted funds such as scholarship funds. Examples of local funds used to support capital projects include: auxiliary revenues (housing, dining, bookstore, parking, etc.); indirect cost recovery from grants and contracts; certain fee income, interest income; "non-credit" tuition income, and unrestricted gifts.
-