

**A PRESENTATION OF THE SCHEMATIC DESIGN FOR PHASE 1 OF THE DAIRY/ANIMAL SCIENCE EDUCATION AND DISCOVERY FACILITY PROJECT WILL TAKE PLACE AT THE MAY MEETING**

AGENDA ITEM 20b

**BOARD MEMORANDUM**

**To:** Board of Regents, State of Iowa  
**From:** Sheila Doyle  
**Date:** April 20, 2005 *ASN*  
**Subject:** Register of Iowa State University Capital Improvement Business Transactions

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**Recommended Actions:**

1. Take the following actions for major capital projects as defined by Board policy:
    - a. Phase 1 of the **Dairy/Animal Science Education and Discovery Facility** project (see pages 3 through 9).
      1. Acknowledge receipt of the University's final submission of information to address the Board's capital project evaluation criteria (page 9);
      2. Accept the Board Office recommendation that the project meets the necessary criteria for Board consideration; and
      3. Approve the schematic design with the understanding that this approval will constitute final Board approval and authorization to proceed with construction.
    - b. **Morrill Hall Renovation** project (see pages 10 through 13).
      1. Approve the revised project budget (\$10,285,500), construction contract award to HPC, L.L.C. (\$7,223,000), and deduct Change Order #1 to the construction contract (approximately \$350,000).
  2. Approve the project description and budget (\$2,150,000) for the **Telecommunications—Inside Plant Systems Upgrade—Phase 5** project (see pages 13 and 14).
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## **Executive Summary:**

Requested  
Approvals

Schematic design for Phase 1 of the **Dairy/Animal Science Education and Discovery Facility** project which would construct a new dairy education and research facility to replace operations of the Ankeny Dairy Farm (see page 3).

- Board approval of the University's plan for the sale of the Ankeny Dairy Farm is required by the 2002 legislation directing the sale of the farm; proceeds from the sale would be used to finance the Phase 1 construction.
- The University anticipates beginning construction of the Phase 1 project in September 2005.
- The site plan and schematic drawings are included with the Board's agenda materials.

Revised project budget (\$10,285,500), construction contract award to HPC, L.L.C. (\$7,223,000), and deduct Change Order #1 to the construction contract (approximately \$350,000) for the **Morrill Hall Renovation** project (see page 10).

- The bid opening for the construction contract resulted in the receipt of two bids which exceeded the consultant's estimate by approximately 21 percent.
- The University's review of the project following the bid opening identified construction cost savings consisting of modifications in the type and quantity of some exterior materials, revisions to sustainable design requirements, and scope reductions for the museum access control and camera security system.
- These modifications would be included in a deduct change order to the construction contract and would reduce the contract amount by approximately \$350,000.
- The University also proposes the acceptance of three deduct alternates to the contract to further reduce construction costs by a total of \$147,000.
- Since the reduced construction contract amount would still exceed the existing construction budget, the University requests approval of a revised project budget in the amount of \$10,285,500, an increase of \$1,285,500.
- The University reports that the requested approvals would allow the renovation of Morrill Hall to proceed without compromising the program functions detailed in the approved building program and schematic design.

Project description and budget (\$2,150,000) for the **Telecommunications—Inside Plant Systems Upgrade—Phase 5** project which would continue telecommunications upgrades for 25 additional campus buildings (see page 13).

**Background and Analysis:**

**Dairy/Animal Science Education and Discovery Facility**

Project Summary

	<u>Amount</u>	<u>Date</u>	<u>Board Action</u>
Permission to Proceed—Phase 1		Sept. 2003	Approved
Initial Review and Consideration of Capital Project Evaluation Criteria		Sept. 2003	Received Report
Permission to Proceed—Phase 2		Aug. 2004	Approved
Interim Review and Consideration of Capital Project Evaluation Criteria		Aug. 2004	Received Report
Program Statement—Phases 1 and 2		Aug. 2004	Approved
Architectural Agreement—Phase 1 Schematic Design through Construction, and Phase 2 Schematic Design (OPN Architects, Des Moines, IA)	\$ 1,241,061	Aug. 2004	Approved
Phase 1 Project Description and Total Budget	15,350,000	Feb. 2005	Approved
Final Review and Consideration of Capital Project Evaluation Criteria		May 2005	Receive Report
Schematic Design		May 2005	Requested

Background

The 2002 General Assembly (SF 2316) directed Iowa State University to sell the Dairy Research Farm located in Ankeny, Iowa.

- The farm, which consists of 1,100 acres surrounded by the City of Ankeny, is inhibiting the City's future growth; the existing facilities at the farm are extremely outdated.
- The legislation directs that the proceeds from the University's sale of the farm are to be used to establish a new dairy research and dairy teaching facility, or for the University's Plant Sciences Institute.

The 102 acre Mortensen Road Dairy Teaching Farm, which was closed by the University in the fall of 2003, is located southwest of the University campus in Ames and is surrounded by City residential areas. In June 2004, the Board approved the demolition of a number of outdated, deteriorated and unsafe structures at the farm. This Farm will continue to be used by the College of Agriculture.

All dairy research and outreach and much of the formal teaching activities have been located at the Ankeny dairy site since the closure of the Mortenson Dairy Teaching Farm.

## Project Scope

The project would construct facilities to serve as the primary site for the education and research activities of the University's dairy science programs.

The Phase 1 project includes construction of several facilities, totaling approximately 206,000 gross square feet, to house the Farm's teaching and meeting functions, 450 milking cattle, and feed and storage operations. Included is a new dairy education and research facility which would provide a single education and research operation to enhance recruitment and retention of students and strengthen research initiatives.

- The Phase 1 facilities would foster collaboration among scientists from the Colleges of Agriculture and Veterinary Medicine, the USDA National Animal Disease Center, regional land-grant universities, and other dairy entities, with the goal of becoming the premier dairy-related education and research center in the Midwest in the areas of nutrition and nutrient management, animal health and well-being, breeding and genetics, and management systems.

The Phase 1 project budget was approved by the Board at the February meeting in the amount of \$15,350,000, to be funded with proceeds from the sale of the Ankeny Farm.

The Phase 2 project, for which approval of the schematic design is not requested at the May Board meeting, would construct a pavilion at the new dairy education and research facility which would include an arena, and teaching and meeting facilities, to house educational seminars, competitive events, and classes for all animal species.

- The pavilion would supplement the Phase 1 facilities to enhance formal education, outreach, and student recruitment, and increase the national prominence of the University's dairy science programs. The pavilion would also be used for programs related to all species of domestic animals.

The Phase 2 project has an estimated cost of \$9,020,000; the University anticipates that this phase would be funded by proceeds from the sale of the Ankeny Farm, and private and/or industry support.

## Project Site

The facilities would be constructed on a 600 acre agricultural site located south of Ames at the southern end of the College of Agriculture's livestock teaching and research facilities. A map indicating the project site is included with the Board's agenda materials.

The Phase 1 facilities would be constructed on approximately 27 acres located in the north central portion of the site; this area is indicated in red on the attached map. The location of the Phase 2 facilities at the site has yet to be determined.

The balance of the acreage would remain productive farm land to support the new dairy facilities.

Phase 1 Site Plan The Phase 1 site plan is included with the Board's agenda materials. The buildings have been sited to best accommodate the efficient movement of animals and other farm operations throughout the Dairy Farm complex, to meet biosecurity requirements, and to promote good ventilation practices. The dairy housing systems at the Farm will resemble the standard systems currently used in the dairy industry, and will utilize the most current technology available.

The Dairy Center, which would house the teaching/meeting facilities and milking operations, would serve as the main entrance to the Dairy Farm complex. The building would be located in the northwest portion of the project site, near the main access road to the farm, with public and semi-public entry drives, and parking areas.

The Special Needs/Hospital Barn, which would house cows with limited mobility and provide general herd health functions, would extend east from the southeast corner of the Dairy Center. This location would accommodate the cows that require easy access to milking operations in the Dairy Center.

The Free Stall Barn, which would house the 450 cow lactating herd, would be located immediately south of the Dairy Center.

- This barn will include some stalls with computerized feeding stations for teaching and research activities.

The solids separation area would be located immediately south of the Free Stall Barn for the separation of solid manure for composting.

The Dry Cow/Transition Barn, Maternity Barn, and Calf Research Barn, would be located immediately south of the Free Stall Barn.

- The Dry Cow/Transition Barn would house cows preparing for maternity.
- The Maternity Barn would house maternity activities and newborn calf care.
- The Calf Research Barn would house the dairy calves and would provide nutritional and husbandry research.
- The three facilities are located in close proximity to one another to facilitate the flow of these functions as well as group feeding and manure removal.

Two manure storage tanks would be located south of the Maternity and Calf Research Barns.

The two heifer barns, one to house cows between the ages of two and eight months, and the other to house cows between the ages of nine and 15 months, would be located directly east of the Free Stall Barn.

The feed storage and delivery functions would be located in the northeast portion of the site, near the main access road to the farm, and would be served by a secured entrance area.

- The structures to be used for machine, hay and fuel storage, and feed mixing, would be existing structures relocated from the Ankeny Farm.

The Metabolism Barn, which would provide an isolated facility for metabolism and nutritional studies, would be located immediately east of the bunker silos with a secured, dedicated entrance area.

A large pasture area would be maintained in the southeast corner of the site; smaller pasture areas would exist adjacent to the individual barns.

The farm manager's residence, which is required for the security of the farm operations 24 hours a day, seven days a week, would be located west of the Dairy Center.

- This residential facility is not included on the site plan since it has yet to be designed.

A composting facility would be developed off-site to serve the Dairy Farm as well as the University's other livestock teaching and research facilities.

#### Phase 1 Farm Facilities Exterior Design

The exterior of each farm building features a functional, economical design appropriate to the use of the individual structure. Each building element would serve a functional purpose for the structures; this would include metal overhead doors to accommodate animals and vehicles, hollow metal doors for efficient personnel ingress and egress, and ridge vents for maximized natural ventilation. The roofs of the facilities are consistent with modern farm structure design.

#### Dairy Center

The Dairy Center would be constructed of corrugated metal with brick and stone at the north façade to replicate building materials used on the University's main campus. This would serve to identify the building as a southern anchor to the College of Agriculture's livestock teaching and research facilities corridor. The entrance areas at the north, and along the east and west walls, would feature metal canopy structures.

The roof would feature a pitched corrugated metal roof for the central third of the building, and a low-sloped standing seam metal roof for the east and west thirds of the building. The life expectancy of the metal roofing material is approximately 30 years.

#### Remaining Structures

All of the barns, and a portion of the storage functions, would be constructed of durable metal siding with pitched corrugated metal roofs. The life expectancy of the metal roofing material is approximately 30 years.

Dairy Center  
Schematic  
Design

The remaining storage facilities would consist of fabric-covered, non-insulated arched structures. The life expectancy of the fabric material is approximately 15 years.

The schematic drawing for the Dairy Center is included with the Board's materials. The following are highlights of the interior design.

The Dairy Center would have three major areas.

- The main north entrance, visitor center, milking parlor with double 12 (24) stalls, and animal holding area would be located in the central third of the building.
  - The visitor center would provide a public viewing area of the milking parlor operations.
- The teaching and meeting functions would be housed in the western third of the building.
  - This would include a classroom with flexible seating for 40 individuals, a sample prep room for testing milk from the herd, a kitchenette, restrooms, and building support spaces.
- The administrative offices, employee support areas (for use by the 12 FTEs at the Farm), and milk storage tanks would be housed in the eastern third of the building; this would include employee locker/shower rooms, a milk room for storing and transferring milk from storage tanks to the truck pick-up location along the east wall, and a mechanical/utility room.

The building entrance areas located along the east and west walls would serve an east-west corridor that would connect the three wings of the building. A north-south corridor between the central and east wings would provide access to the animal holding area.

Each third of the building would be separated by corridor doors and ventilation systems to prevent the spread of odor; the corridor doors would also provide different levels of security for the building.

The Dairy Center has been designed on a grid system for construction of a cost efficient, pre-engineered steel framing system.

Square Footage Table

The following table provides the detailed square footages for the building program and the schematic design.

<u>Detailed Building Program</u>		<u>Building Program</u>	<u>Schematic Design</u>
<u>Phase 1 Dairy Facilities</u>			
Dairy Center			
Milking Center	8,600		14,308
Teaching and Meeting Facilities	4,000		3,225
Milking Cow Free Stall Barn(s) <sup>1</sup>	74,000		67,496
Transition/Dry Cow/Hospital/Laboratory <sup>2</sup>	45,000		
Dry Cow/Transition Barn			16,432
Special Needs/Hospital Barn			6,811
Maternity Barn			5,796
Calf Research Barn–Production Animals	20,000		7,100
Calf Research Barn–Biosecure Animals	44,000		N/A
Young Stock Housing (Heifer Barns) <sup>3</sup>	43,000		20,050
Feed Storage and Delivery	42,000		47,280
Metabolism Barn	11,600		4,224
Machine Storage	15,000		6,000
Manager’s Residence	2,500		2,500
Compost Facility (Off Site)	N/A		5,000
Phase 1 Total	309,700	gsf	206,222

<sup>1</sup>Programmed as three facilities but consolidated into one barn in schematic design.

<sup>2</sup>Three functions programmed as one facility but separated into three structures in schematic design in response to health and biosecurity concerns.

<sup>3</sup>A third heifer barn, to house cows between the ages of 16 and 22 months, was included in the building program and would be bid as an add alternate for construction subject to the receipt of favorable bids.

Program/  
Schematic  
Comparison

The schematic design reflects a total decrease of 103,478 gross square feet from the approved building program.

The decrease can be attributed to a reduction in the project scope, consistent with available funding, to improve square footage efficiencies.

- The milking cow herd was reduced from 500 to 450 head, and corresponding building square footages have been reduced; the University reports this reduction would not affect the College of Agriculture’s teaching, research, and outreach programs.
- The three Free Stall Barns have been consolidated into one facility; one calf research barn, one heifer barn (to be bid as add alternate), and some support facilities have been eliminated.

The increase in the square footage for the Milking Center can be attributed to an originally underestimated square footage for the animal holding area.

Schedule	The University anticipates beginning construction in September 2005, with an anticipated completion date of October 2006.
Additional Information	Proceeding with construction of the Phase 1 project is dependent upon Board approval of the University's plan for the sale of the Ankeny Dairy Farm, since proceeds from the sale would finance construction of the project.
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Evaluation Criteria	Since the project meets the Board's definition of a major capital project, the University has provided the following information in response to the Board's evaluation criteria.
Institutional Mission/Strategic Plan	The ISU Strategic Plan for 2000-2005 is <i>Pursuing Excellence as Iowa's Engaged University</i> and calls for <i>Becoming the Best Land Grant University</i> . Further, the faculty and leadership also aspire for ISU to be "the best" at providing constituents with a balance of the three primary missions of a land grant institution: learning, discovery, and engagement. The Dairy/Animal Science Education and Discovery Facility will enhance these goals by providing the infrastructure that can support the best dairy science education and research program in the region, if not in the U.S. The facility will provide the opportunity for learner-centered experiential teaching, integrated multi-discipline learning and discovery, potential for regional and national technology-transfer and outreach education activities, and cutting-edge research in management, health, and animal care. Activities and productivity at this facility will attract the brightest and best students and faculty to ISU.
Other Alternatives Explored	No alternative exists to building a new facility. The Mortensen Road Dairy Teaching Farm was closed in 2003 and the Ankeny Dairy site must be sold due to legislative mandate.
Impact on Other Facilities and Square Footage	The Mortensen Road Dairy Farm will be retained by the university and be used by the College of Agriculture. The Ankeny Farm will be sold.
Financial Resources for Construction Project	The project will be funded by the sale of the Ankeny Farm.
Financial Resources for Operations and Maintenance	The new Dairy will be staffed primarily with existing position lines from the Ankeny Dairy. Operating budget will come from a combination of milk income, dairy cattle sales, and research funding. Potential research funding sources include: USDA – NRI, NADC, and other USDA projects; NIH; dairy breed associations; and agricultural industry firms related to animal breeding, animal health, and animal nutrition.
External Forces	The Ankeny Dairy Farm must be sold due to a legislative mandate.

**Morrill Hall Renovation**

Project Summary

	<u>Amount</u>	<u>Date</u>	<u>Board Action</u>
Feasibility Study—Building Structure and Exterior (Wiss, Janney, Elstner Associates, Chicago, IL)	\$ 23,500	Feb. 2002	Not Required*
Feasibility Study—Building Use and Layout (Baldwin White Architects, Des Moines, IA)	39,500	Nov. 2002	Not Required**
Permission to Proceed		Jan. 2003	Approved
Architectural Agreement—Pre-Design Through Schematic Design (RDG Bussard Dikis, Des Moines, IA)	211,723	May 2003	Approved
Initial Review and Consideration of Capital Project Evaluation Criteria		Sept. 2003	Received
Program Statement		Sept. 2003	Approved
Final Review and Consideration of Capital Project Evaluation Criteria		Feb. 2004	Received Report
Schematic Design		Feb. 2004	Approved
Project Description and Total Budget	9,000,000	Feb. 2004	Approved
Architectural Agreement—Design Development Through Construction (RDG Planning and Design, Des Moines, IA)	885,785	Feb. 2004	Approved
Revised Project Budget	10,285,500	May 2005	Requested
Construction Contract Award (HPC, L.L.C.)	7,223,000	May 2005	Requested
Construction Change Order #1 (HPC, L.L.C.)	- 350,000 (est)	May 2005	Requested

\* Approved by University in accordance with Board procedures.

\*\* Approved by Executive Director in accordance with Board procedures.

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**Background** Morrill Hall, constructed in 1890, is one of the University's oldest buildings and is located in a prominent central campus location. (A map indicating the location of the facility is included as Attachment A.)

The building, which consists of 25,525 gross square feet of space, has had no major remodeling or upgrading since its construction; its condition has deteriorated substantially.

A study completed for the University by Wiss, Janney, Elstner Associates concluded that the condition of the structure would support a remodeling project for future use of the building.

The Morrill Hall Renovation project, as approved with the final evaluation criteria, schematic design, and project description and budget (\$9,000,000) in February 2004, would renovate the historic facility to house the Christian Petersen Art Museum, the Center for Teaching Excellence, the Center for Visual Learning in Textiles and Clothing, and general university classrooms.

## Bid Review

The bid opening for the construction contract, which was held on March 10, 2005, resulted in the receipt of two bids; the low Base Bid of \$7,370,000 exceeded the consultant's estimate by approximately 21 percent.

Following the bid opening, the University and the project architects, RDG Planning and Design, reviewed the project with the low bidder, HPC, LLC of Ames, Iowa, to determine the reason for the high bids and to explore methods to reduce construction costs without impacting the programs to be housed in the building.

These discussions identified a number of reasons for the bids being higher than the estimated costs:

- Complexity of the project;
- Recent unexpected inflation in material and fuel costs; and
- Higher costs than anticipated for exterior masonry restoration, mechanical/building access controls and security systems, and the specialized lighting fixtures for the art displays in the galleries and public corridors.

## Construction Cost Reductions

As a result of this review, the University has identified several construction modifications, which would have a minimal impact on the exterior appearance of the building, to reduce the cost of the construction contract by approximately \$350,000:

- Revising brick types for the exterior masonry; the revised brick type would be very similar to the brick originally specified and would be used in the arches over the windows.
- Reducing the amount of limestone at the east entrance and west elevator addition; the east stairway and base of the west addition would be constructed of brick rather than of limestone.
- Revising sustainable design (LEED) requirements.

In addition, the University plans to review options at a future date for modifying the scope of the access control system in the museum areas.

The University also proposes the use of three deduct alternates to the construction contract to further reduce construction costs by a total of \$147,000:

- Alternate #1 (-\$44,000) would eliminate the wood trim on the interior windows.
- Alternate #4 (-\$52,000) would substitute steel railings for limestone walls along the handicap ramp and lower level stairway.
- Alternate #6 (-\$51,000) would delete the use of video surveillance cameras from the museum areas.

Budget Review	<p>While the proposed construction modifications and the acceptance of the deduct alternates would reduce the construction contract from \$7,370,000 to approximately \$6,873,000, the contract amount would still exceed the existing construction budget.</p> <p>The University also reports additional utility infrastructure costs to provide electrical and telecommunications service to Morrill Hall.</p>
Requested Approvals	<p>The University requests approval of a revised project budget in the amount of \$10,285,500, an increase of \$1,285,500.</p> <ul style="list-style-type: none"> <li>• The revised budget includes the addition of General University funds, Building Repair funds, and/or Income from Treasurer's Temporary Investments (\$1,478,500), and Utility Infrastructure Funds (\$300,000) which would fund the additional utility costs.</li> </ul> <p>The University also requests approval of the construction contract award to HPC, LLC, and deduct Change Order #1 which includes the construction modifications identified above.</p> <ul style="list-style-type: none"> <li>• The contract award would be for the Base Bid of <u>\$7,370,000</u>, less Alternate #1 of <u>\$44,000</u>, less Alternate #4 of <u>\$52,000</u>, less Alternate #6 of <u>\$51,000</u>, for a total award of <u>\$7,223,000</u>.</li> <li>• Change Order #1, in the deduct amount of approximately \$350,000, would reduce the construction contract to approximately \$6,873,000, which is within the revised construction budget.</li> </ul> <p>The University reports that the requested approvals would allow the renovation of Morrill Hall to proceed without compromising the program functions outlined in the approved building program and schematic design.</p>
Schedule	<p>The University plans to begin construction in late May 2005, with an anticipated completion date of January 2007.</p>

Project Budget

	<u>Initial Budget (Feb. 2004)</u>	<u>Revised Budget (May 2005)</u>
Construction Costs	\$ 6,773,370	\$ 8,160,920
Professional Fees	1,776,530	1,738,580
Movable Equipment	217,500	181,000
Relocation	27,850	5,000
Project Contingency	<u>204,750</u>	<u>200,000</u>
<b>TOTAL</b>	<b><u>\$ 9,000,000</u></b>	<b><u>\$ 10,285,500</u></b>
Source of Funds:		
Private Giving	\$ 8,150,000	\$ 7,657,000
General University Funds/Building Repair Funds/Income from Treasurer's Temporary Investments	0	1,478,500
Capital Appropriations (2002 General Assembly General Classrooms and Auditoriums Appropriation)	850,000	850,000
Utility Infrastructure Fund	<u>0</u>	<u>300,000</u>
	<b><u>\$ 9,000,000</u></b>	<b><u>\$ 10,285,500</u></b>

**Telecommunications—Inside Plant Systems Upgrade—Phase 5**

Project Summary

	<u>Amount</u>	<u>Date</u>	<u>Board Action</u>
Project Description and Total Budget	\$ 2,150,000	May 2005	Requested

**Background**      The University began in 2001 the upgrade of the communications infrastructure in its campus buildings.

The work has included the correction of various deficiencies such as the location of equipment entrances into the buildings, system security issues, outdated wiring that will not support current technology, and the lack of video and backup power systems.

The University has identified and prioritized the deficiencies associated with the communications infrastructure for each campus building, and the work has been undertaken as funding has become available.

Phases 1 through 4 of the project have provided telecommunications upgrades in approximately 50 campus buildings.

**Project Scope**      The Phase 5 project would upgrade the telecommunications infrastructure for an additional 25 campus buildings.

- The project would replace voice and data cables, renovate equipment rooms to comply with current industry standards, and provide environmental systems, security access controls, raceway systems, and outlets.

The University plans to begin construction in March 2006 with completion scheduled for March 2007.

Additional Information

Upon the completion of the Phase 5 project, the University will have upgraded the telecommunications systems in the majority of the academic and research buildings on campus.

The University plans to undertake a future Phase 6 project as funds become available.

- This phase would provide telecommunications upgrades for approximately 23 additional buildings, which could include the residence halls and/or Research Park facilities.

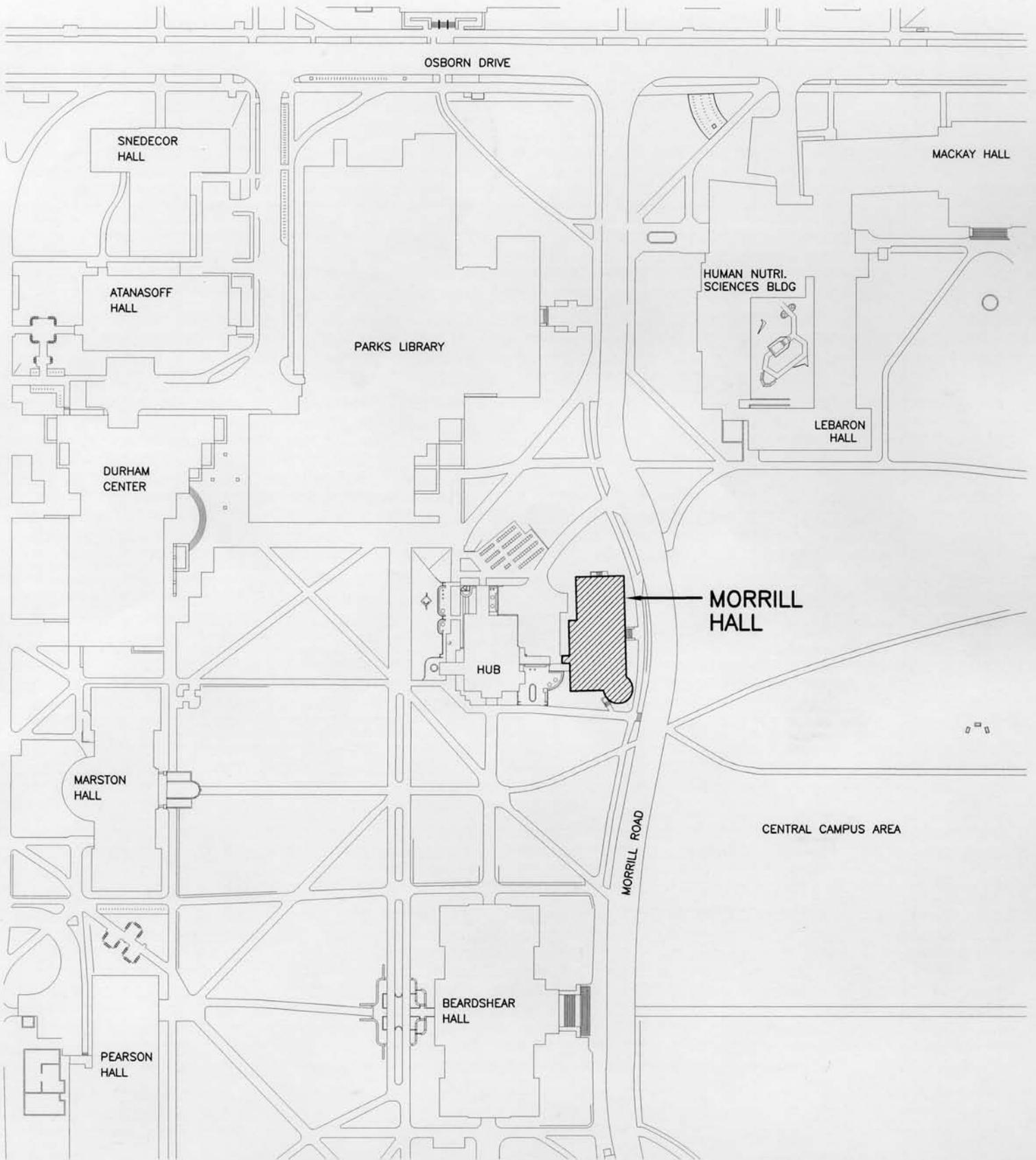
Funding

Telecommunications Improvement and Extension Funds.

	<u>Project Budget</u>
Construction Cost	\$ 1,804,780
Professional Fees	316,240
Contingency	<u>28,980</u>
TOTAL	<u>\$ 2,150,000</u>

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REVISIONS:
COMPLETED:
ISSUED:

<b>MORRILL HALL</b> <b>RENOVATION</b> <small>h:landscape/board of regents maps - carol/Morrill.dwg</small> <b>AGENDA ITEM 20b</b> <small>Page 15</small>
<b>FACILITIES PLANNING AND MANAGEMENT</b>

APPROVED BY:
CHECKED BY:
DESIGNED BY:
SCALE: Not to scale
REQUEST NO.