



February 10, 2022

The Honorable Eric J. Holcomb  
Governor of the State of Indiana  
Statehouse  
Indianapolis, IN 46204

Dear Governor Holcomb:

At its meeting on February 4, 2022, the Purdue University Board of Trustees approved the planning, financing, construction and award of construction contracts for the Life Science Ranges Phenotyping Greenhouse Building.

This project includes the construction of an approximately 20,000 square foot phenotyping-enabled greenhouse that includes conveyors allowing for plant transport from the new greenhouse to the Ag Alumni Seed Controlled Environment Phenotyping Facility (AAPF). The new greenhouse will be connected to the AAPF and will require the demolition of two existing 1950s era Life Science Ranges on the West Lafayette campus.

This project directly supports *Purdue's Next Moves Plant Sciences 2.0* initiative and will expand phenotyping capabilities and capacity while improving plant growing conditions.

The estimated total project cost is \$20,000,000, funded by Operating Funds-Reserves.

Subject to review by the Commission for Higher Education and recommendation by the State Budget Committee and the Budget Agency, we request your approval to proceed with this project. Attached are the completed forms that the Commission has prescribed for its review of such projects. We will be happy to answer any questions you or your staff may have or to provide any additional information that is needed.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. Ruhl', with a long horizontal line extending to the right.

Christopher A. Ruhl  
Chief Financial Officer and Treasurer

Attachments

c: Seth Hinshaw, Chief Financial Officer, Indiana Commission for Higher Education  
Zachary Jackson, Director, Indiana State Budget Agency  
Jasmine Williams, Assistant Director, Indiana State Budget  
Kathleen Thomason, Comptroller, Purdue University  
Anne Hazlett, Senior Director, Government Relations, Purdue University

**PROJECT COST SUMMARY**  
Life Science Ranges Phenotyping Greenhouse Building

<b>Institution:</b>	Purdue University	<b>Budget Agency Project No.:</b>	B-1-22-1-08
<b>Campus:</b>	West Lafayette	<b>Institutional Priority:</b>	N/A
<b>Previously approved by General Assembly:</b>	No	<b>Previously recommended by CHE:</b>	No
<b>Part of the Institution's Long-term Capital Plan:</b>	Yes		

<b>Project Size:</b>	20,000 GSF (1)	13,285 ASF (2)	0.66425 ASF/GSF
<b>Net change in overall campus space:</b>	8,960 GSF	3,913 ASF	

<b>Total cost of the project (3):</b>	\$ 20,000,000	<b>Cost per ASF/GSF:</b>	1000 GSF
<b>Total cost of the demolition:</b>	\$ -		1505 ASF
<b>Funding Source(s) for project (4):</b>	Amount	Type	
	\$ 20,000,000	Operating Funds - Reserves	
<b>Estimated annual debt payment (6):</b>	N/A		
<b>Are all funds for the project secured:</b>	Yes		

**Project Funding:**  
This project is funded by Operating Funds-Reserves, and all funds are secured.

**Project Cost Justification**  
The project cost is higher than the project listed in the Comparable Project section. Justification for the price difference is included in the Comparable Project section.

<b>Estimated annual change in cost of building operations based on the project:</b>	\$ 32,123
<b>Estimated annual repair and rehabilitation investment (5):</b>	\$ 199,500

(1) Gross Square Feet (GSF)- Sum of all area within the exterior envelope of the structure.  
(2) Assignable Square Feet (ASF)- Amount of space that can be used by people or programs within the interior walls of a structure. Assignable square feet is the sum of the 10 major assignable space use categories: classrooms, laboratories, offices, study facilities, special use facilities, general use facilities, support facilities, health care facilities, residential facilities and unclassified facilities. For information on assignable space use categories, see Space-Room Codes tab.  
(3) Projects should include all costs associated with the project (structure, A&E, infrastructure, consulting, FF&E, etc.)  
(4) Be consistent in the naming of funds to be used for projects. If bonding, note Bonding Authority Year (1965, 1929, 1927, etc.)  
(5) Estimate the amount of funding the institution would need to set aside annually to address R&R needs for the project. CHE suggests 1.5% of total construction cost  
(6) If issuing debt, determine annual payment based on 20 years at 4.75% interest rate  
- If project is a lease-purchase or lease, adjust accordingly. Note the total cost of the lease in the project cost, and annual payments in project description

**PROJECT DETAILED DESCRIPTION - ADDITIONAL INFORMATION**  
**Life Science Ranges Phenotyping Greenhouse Building**

<b>Institution:</b>	Purdue University	<b>Budget Agency Project No.:</b>	B-1-22-1-08
<b>Campus:</b>	West Lafayette	<b>Institutional Priority:</b>	N/A

**Description of Project**

This project will construct a new, approximately 20,000 GSF greenhouse facility. The building will be located on the West Lafayette campus south of Lilly Hall of Life Sciences and joined to the existing Ag Alumni Seed Controlled Environment Phenotyping Facility (AAPF) on South Russell Street. The greenhouse will be equipped with conveyors that are connected to AAPF, allowing for the automated movement of plants through both facilities.

AAPF is a controlled environment plant imaging facility that supports the University's phenotypic analysis of field traits and allows highly uniform growth conditions for precise control and replication of experimental variables that cannot be easily controlled in the field.

The construction of the new greenhouse expands phenotyping capabilities and requires the demolition of two 1950s era Life Science Ranges (ranges 4 and 6) immediately south of AAPF.

**Need and Purpose of the Program**

This project will expand phenotyping capabilities and capacity while improving plant growing conditions. This project will allow the College of Agriculture to maximize the previous Plant Science investment in the AAPF camera capabilities and will provide space to add advanced instrumentation for measuring attributes such as water, carbon and nitrogen cycling to minimize greenhouse gas emissions for plants and small trees.

Construction of the new greenhouse directly supports Purdue's Next Moves Plant Sciences 2.0 initiative. Additionally, the 2018 Giants Leaps Master Plan identified the project location as suitable for new greenhouses.

**Space Utilization**

The proposed Life Science Ranges Phenotyping Greenhouse Building will provide greenhouse space that totals 13,285 ASF. With the demolition of the existing Life Science Ranges 4 and 6, the net increase in campus space is 3,913 ASF.

**Comparable Projects**

Ag Alumni Seed Controlled Environment Phenotyping Facility (AAPF) (2016)

o 10,210 GSF

o \$6,250,000

o \$612/GSF

o AAPF allows for phenotypic analysis of field traits and the addition of two large growth chambers.

o The following accounts for the differences in cost/GSF between the two projects:

- AAPF was a slab construction, and the new proposed greenhouse will have a partial basement to house the mechanical, electrical and plumbing (MEP) infrastructure.

- The proposed greenhouse project includes more research components and conveyors.

- Additionally, the greenhouse industry has experienced cost increases in the last few years.

o The proposed project is nearly double the size of the comparable project and will add 5,000 square feet of plant growth space to a key phenotyping and greenhouse location south of Lilly Hall.

**Background Materials**

**CAPITAL PROJECT REQUEST FORM**  
**INDIANA PUBLIC POSTSECONDARY EDUCATION**  
**INSTITUTION CAMPUS SPACE DETAILS FOR Life Science Ranges Phenotyping Greenhouse Building**

(INSERT PROJECT TITLE AND SBA No.)	Current Campus Totals			Subtotal Current and Future Space	Capital Request		Net Future Space
	Current Space in Use	Space Under Construction (1)	Space Planned and Funded (1)		Space to be Terminated (1)	New Space in Capital Request (2)	
<b>A. OVERALL SPACE IN ASF</b>							
Classroom (110 & 115)	340,043	-	-	340,043			340,043
Class Lab (210,215,220,225,230,235)	746,058	82,254	4,425	832,737			832,737
Non-class Lab (250 & 255)	1,654,516	20,816	(1,157)	1,674,175			1,674,175
Office Facilities (300)	2,369,230	33,780	(11,319)	2,391,691			2,391,691
Study Facilities (400)	390,855	7,003	8,166	406,024			406,024
Special Use Facilities (500)	1,220,406	-	-	1,220,406	9,372	13,285	1,224,319
General Use Facilities (600)	992,645	12,327	3,135	1,008,107			1,008,107
Support Facilities (700)	2,867,250	64	(726)	2,866,588			2,866,588
Health Care Facilities (800)	111,766	89,901	-	201,667			201,667
Resident Facilities (900)	2,698,334	-	-	2,698,334			2,698,334
Unclassified (000)	21,002	-	-	21,002			21,002
<b>B. OTHER FACILITIES</b> (Please list major categories)				-			-
<b>TOTAL SPACE</b>	<b>13,412,104</b>	<b>246,145</b>	<b>2,524</b>	<b>13,660,773</b>	<b>9,372</b>	<b>13,285</b>	<b>13,664,686</b>

Notes:  
(1) Identify in a footnote the specific facilities that are included in the data in these columns. Do not include pending approval, non-submitted projects or non-funded projects

- Space/Room codes based on Postsecondary Ed Facilities Inventory and Classification Manual (2006)

Space under construction includes:

- Vet Med Teaching Hospital
- Gateway Complex
- Purdue Bands & Orchestra Building
- Hypersonics Building
- Secure Data Research Project
- Child Care Center Building

Space planned and funded includes:

- Schleman/Stewart Renovation
- Whistler Mechanical Project

(2) Space added as part of this project includes special use (specifically greenhouse) spaces.

**CAPITAL PROJECT COST DETAILS**  
**Life Science Ranges Phenotyping Greenhouse Building**

<b>Institution:</b>	Purdue University	<b>Budget Agency Project No.:</b>	B-1-22-1-08
<b>Campus:</b>	West Lafayette	<b>Institutional Priority:</b>	N/A

**ANTICIPATED CONSTRUCTION SCHEDULE**

	<u>Month</u>	<u>Year</u>
<b>Bid Date (GMP delivery)</b>	September	2022
<b>Start Construction</b>	November	2022
<b>Occupancy (End Date)</b>	August	2024

**ESTIMATED CONSTRUCTION COST FOR PROJECT**

	<u>Cost Basis (1)</u>	<u>Estimated Escalation Factors (2)</u>	<u>Project Cost</u>
<b><u>Planning Costs</u></b>			
a. Engineering	\$ 750,000		\$ 750,000
b. Architectural	\$ 750,000		\$ 750,000
c. Consulting	\$ 500,000		\$ 500,000
<b><u>Construction</u></b>			
a. Structure	\$ 4,600,000		\$ 4,600,000
b. Mechanical (HVAC, plumbing, etc.)	\$ 4,600,000		\$ 4,600,000
c. Electrical	\$ 4,100,000		\$ 4,100,000
<b><u>Movable Equipment</u></b>			\$ -
<b><u>Fixed Equipment</u></b>	\$ 400,000		\$ 400,000
<b><u>Site Development/Land Acquisition</u></b>	\$ 500,000		\$ 500,000
<b><u>Other (PM fees, contingencies)</u></b>	\$ 3,800,000		\$ 3,800,000
<b>TOTAL ESTIMATED PROJECT COST</b>	<b>\$ 20,000,000</b>	<b>\$ -</b>	<b>\$ 20,000,000</b>

(1) Cost Basis is based on current cost prevailing as of: (INSERT MONTH AND YEAR)

(2) Explain in the Description of Project Section of the "Cap Proj Details" schedule the reasoning for estimated escalation factors

## CAPITAL PROJECT OPERATING COST DETAILS

### Life Science Ranges Phenotyping Greenhouse Building

<b>Institution:</b>	Purdue University	<b>Budget Agency Project No.:</b>	B-1-22-1-08
<b>Campus:</b>	West Lafayette	<b>Institutional Priority:</b>	N/A

<u>ANNUAL OPERATING COST/SAVINGS (1)</u>	<u>GSF OF AREA AFFECTED BY PROJECT</u>			
	Cost per GSF	Total Operating Cost	Personal Services	Supplies and Expenses
1. Operations	0.63	\$ 12,500	10,000	2,500
2. Maintenance	0.66	\$ 13,168	10,407	2,761
3. Fuel		\$ -		
4. Utilities	2.30	\$ 46,058	6,098	39,960
5. Other		\$ -		
<b>TOTAL ESTIMATED OPERATIONAL COST/SAVINGS</b>	<b>3.59</b>	<b>\$ 71,726</b>	<b>\$ 26,505</b>	<b>\$ 45,221</b>

Description of any unusual factors affecting operating and maintenance costs/savings.

The total annual operating cost for the new greenhouse is \$71,726. The demolition of two existing ranges results in a net increase in space and a net annual operating cost increase of \$32,123.

(1) Based on figures from "Individual Cap Proj Desc" schedule