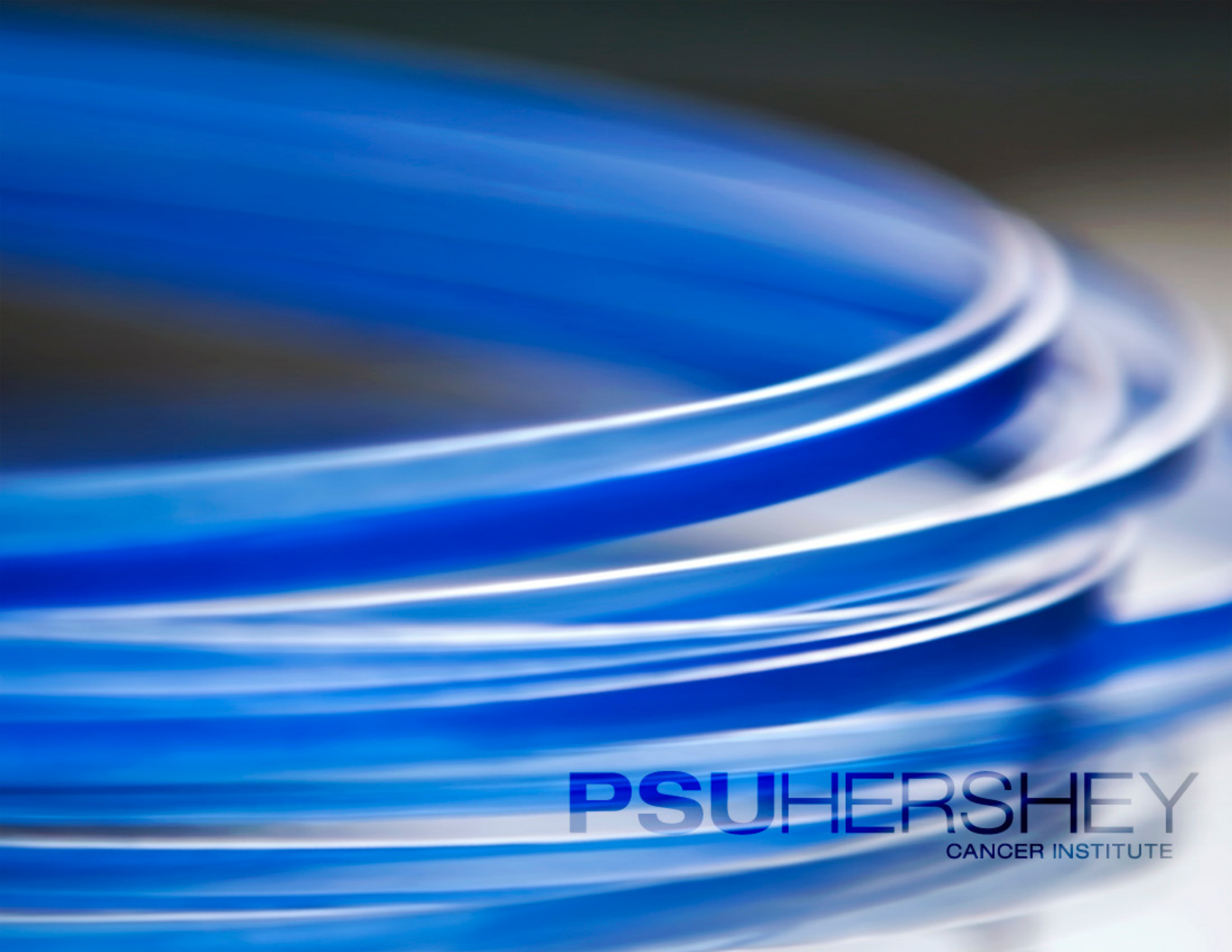
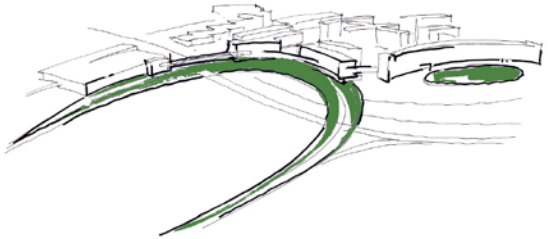

PSUHERSHEY
CANCER INSTITUTE

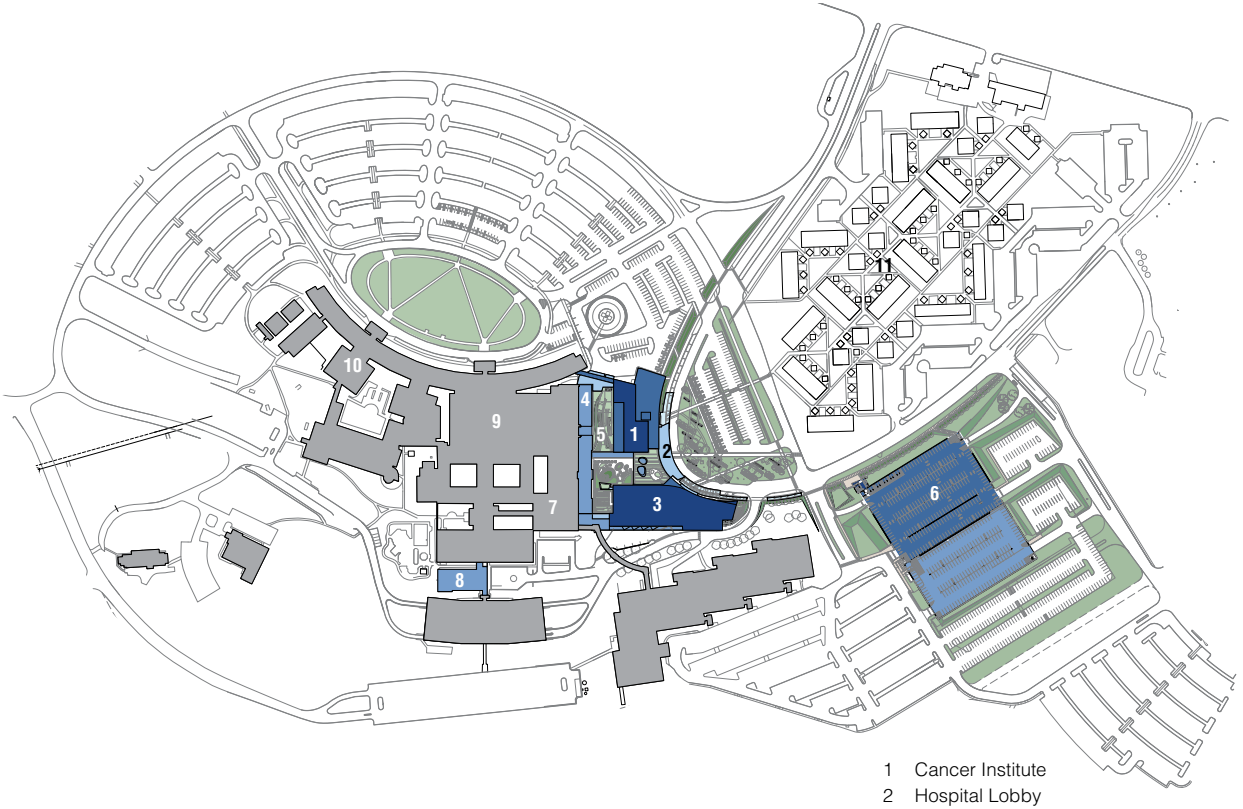
OBJECTIVE AND SOLUTION

The Pennsylvania State University Cancer Institute at the Milton S. Hershey Medical Center is dedicated to finding and delivering a cure for cancer. A unique experiment in translational medicine, it is the synthesis of a traditional bench science research facility with comprehensive outpatient treatment clinics in a single building. Here, traditional boundaries of science are ignored as various modes of inquiry—similarly implemented in laboratories and exam rooms —form a dynamic investigative community.

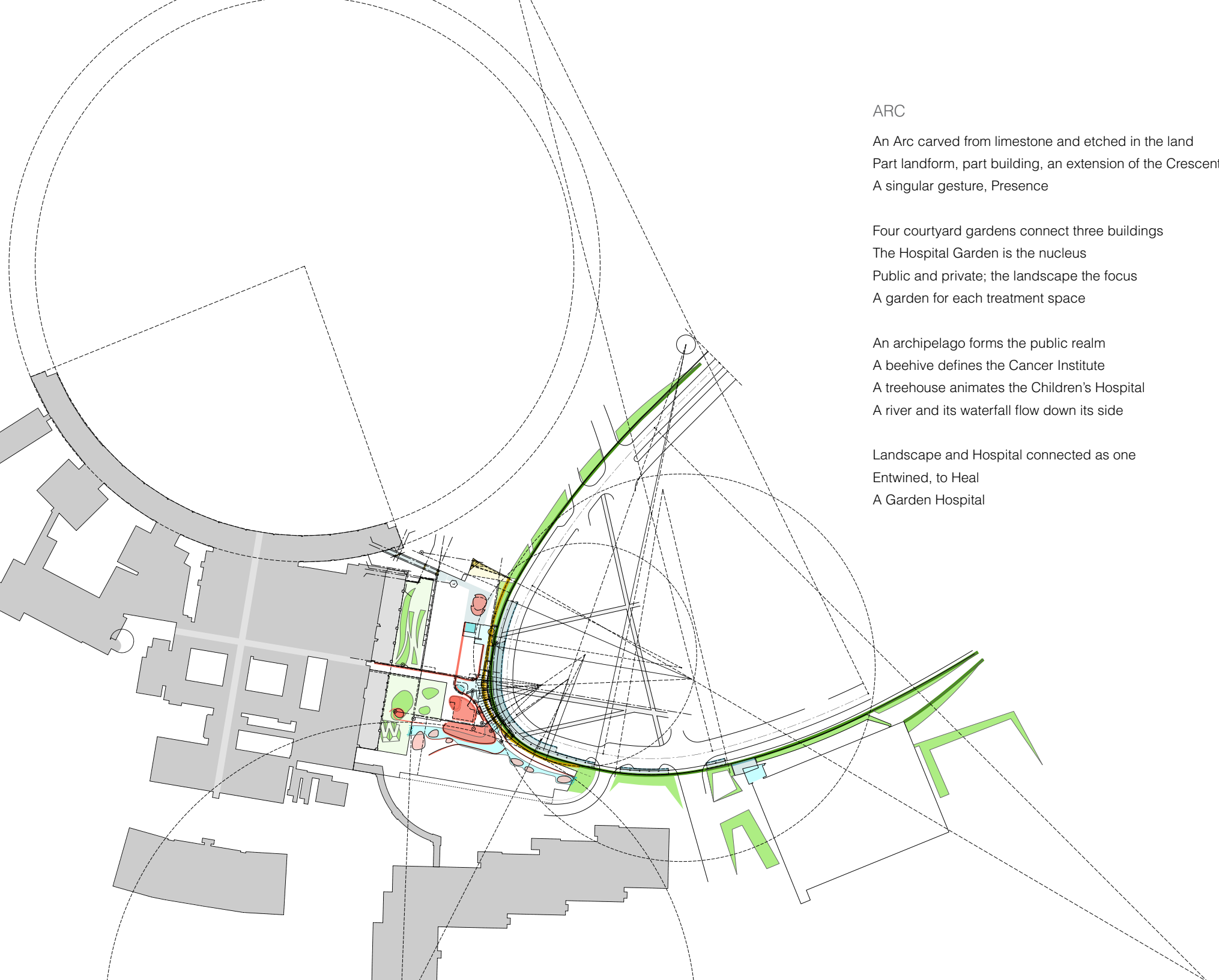


A HEALTHCARE CAMPUS

The Cancer Institute is the first phase of an ambitious large-scale construction project at the Penn State Hershey Medical Center which also includes the adjacent Children's Hospital, a renovated and expanded Emergency Department, and a new parking garage. These components create a critical mass that shifts the center of gravity of the entire hospital complex through the redefinition of identity, access, and the vehicular and pedestrian circulation systems. The Arc, a spatial gesture that unifies all the elements in the master plan, is the cornerstone of the plan and defines the new clinical quadrangle.



1 Cancer Institute
2 Hospital Lobby
3 Children's Hospital (Under Construction)
4 ED Expansion
5 Healing Garden
6 2000-Car Garage
7 Heart Institute
8 Oncology Treatment Building
9 Existing Hospital
10 Medical School
11 Medical School Dormitories



ARC

An Arc carved from limestone and etched in the land
Part landform, part building, an extension of the Crescent
A singular gesture, Presence

Four courtyard gardens connect three buildings
The Hospital Garden is the nucleus
Public and private; the landscape the focus
A garden for each treatment space

An archipelago forms the public realm
A beehive defines the Cancer Institute
A treehouse animates the Children's Hospital
A river and its waterfall flow down its side

Landscape and Hospital connected as one
Entwined, to Heal
A Garden Hospital

"Penn State and the Milton S. Hershey Medical Center Campus are leaders in developing new ways to study and treat diseases. By looking at the entire campus as a connected organism—from medical education to research to patient care—our plan has created a new model of integration."

Architect

AERIAL VIEW OF THE MEDICAL CENTER & CRESCENT BEFORE CONSTRUCTION OF CANCER INSTITUTE

"The layout of the Institute shifts a paradigm by housing researchers and clinicians together – facilitating the interactions that will contract the time between research innovation and clinical implementation."

Chair, Department of Radiation Oncology

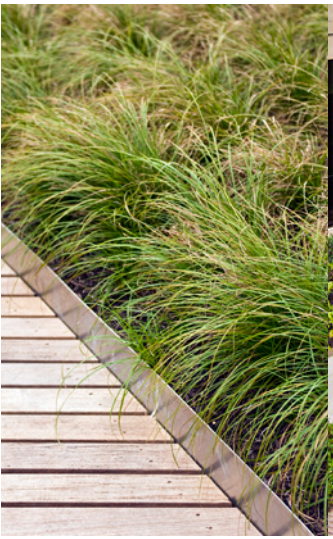
ARRIVAL

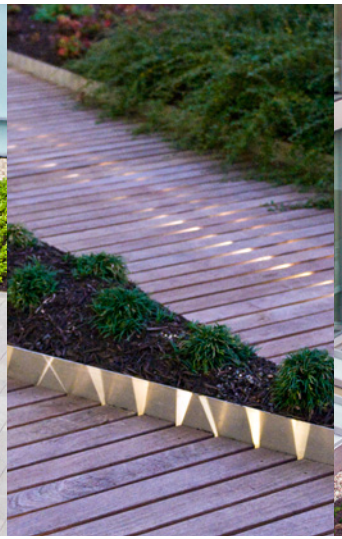
In their massing, landscapes, and exterior materials, the new buildings of the Clinical Quadrangle express an identity that is open, energetic, and forward-looking while remaining respectful of the building elements on site. The Arc, itself, is a contemporary response to the form language of the original Crescent Building. Its form contains the Cancer Institute, Main Hospital Lobby, and Children's Hospital, which are sited adjacent to existing buildings separated by internal courtyards. A new public gateway serves as an icon of state-of-the-art patient care, research, education and innovation through the reorganization of the public entry sequence and growth around a new campus green. These progressive ideals are reinforced in the materiality of the metal and wood canopy that shelters the main drop-off area. The front façade of the Cancer Institute reveals the volume of the labs floating above the clinic spaces, which are framed by the canopy and serve to break the massing down into a more human scale.

A GARDEN HOSPITAL

The initial campus-scale gesture is broken down and propagated through the design as a series of courtyards ranging from large, public, active gathering spaces to private healing gardens and roof terraces. These courtyards act as gaskets between new and existing buildings, build on the institution's heritage of internal green spaces that connect patients, clinicians, and researchers with the landscape, while also breaking down the scale of a massive institutional floor plate. Each garden is tailored to suit its primary users: the healing garden is dedicated to cancer patients, the hospital courtyard, which is contiguous to the main hospital lobby, is for the general public and an animated activity garden is for children. Healing Gardens front all the major clinical healing spaces in both the Cancer Institute and Children's Hospital; they are also framed by connections to major public nodes.

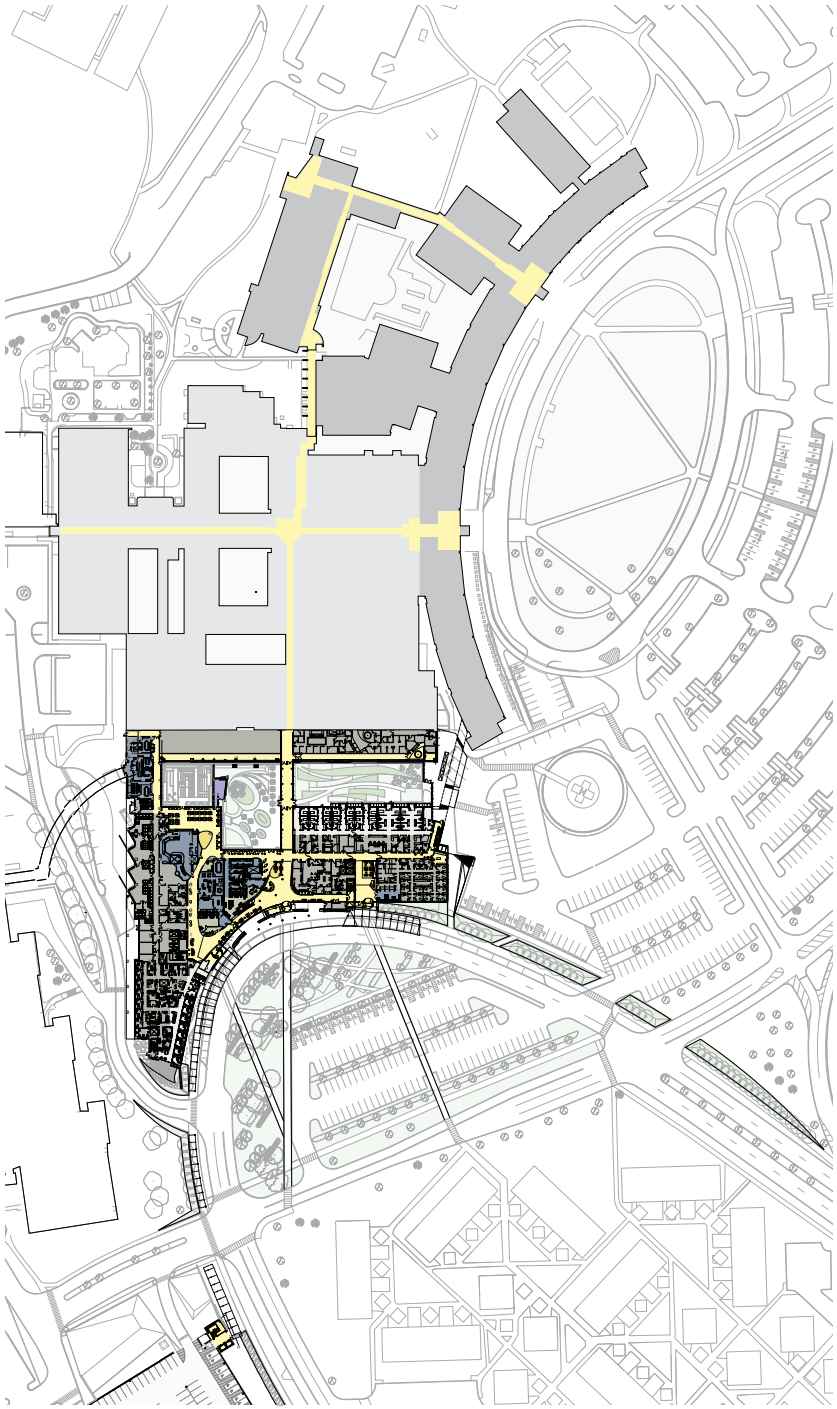
1 Cancer Institute
Healing Garden
2 Hospital Garden
3 Children's Garden
4 Children's Roof Garden
5 Front Entry Court
6 Rain Garden
7 Medical School Dormitories



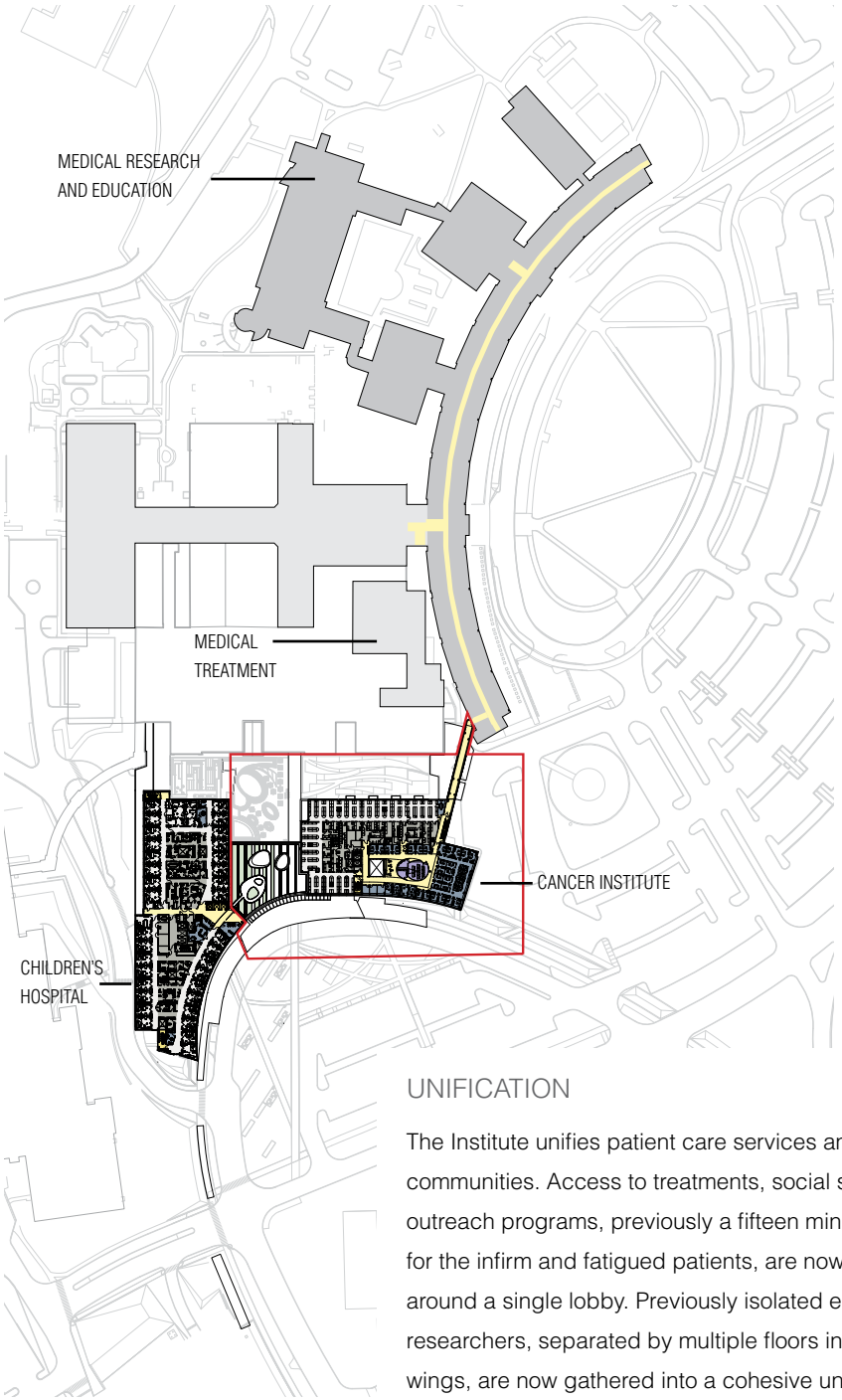


“The landscaping contributes to a welcoming atmosphere and the soft plants are a great balance for the sharp angles and soaring space.”

Research Coordinator



LEVEL 1



LEVEL 2

UNIFICATION

The Institute unifies patient care services and research communities. Access to treatments, social services and outreach programs, previously a fifteen minute walk apart for the infirm and fatigued patients, are now clustered around a single lobby. Previously isolated enclaves of researchers, separated by multiple floors in various wings, are now gathered into a cohesive unit with access to shared services and an expanded area of growth.

TREATMENT – RESEARCH

RESEARCH — TREATMENT

TRANSLATIONAL RESEARCH AND MEDICINE

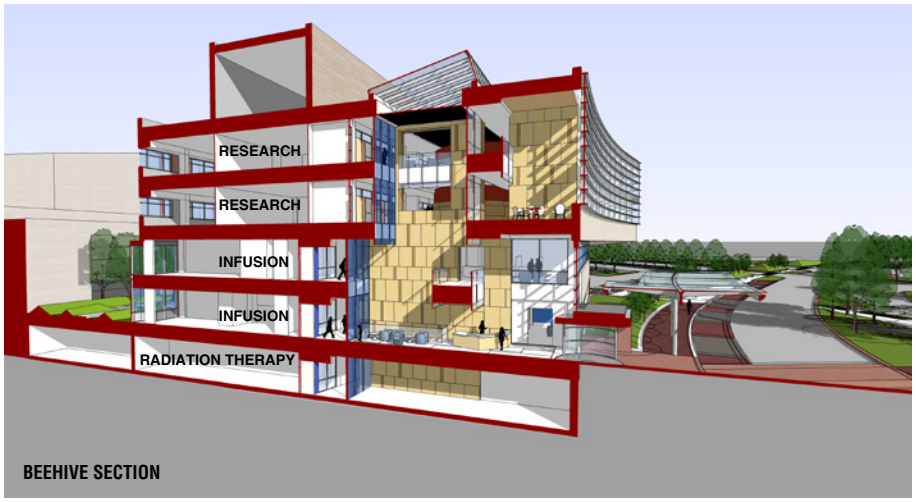
The Cancer Institute is the spatial embodiment of the translational research model where laboratory and clinical functions are strategically intermixed to encourage collaboration. In this new building, research activities are performed in the clinic and at the bench with little differentiation. It is hoped that this combination of various program typologies in a single facility will leverage synergistic exchanges: contracting the time between scientific discovery and practical implementation. This does not imply direct experimentation on patients, but an increase in the contact between the two ends of the treatment-discovery system. The building allows multiple modes of research and multiple types of treatment to inform and influence one another in unexpected cooperation. In response to the challenging space program, a social experiment is also at work.

"By bringing our cancer researchers and clinicians together under one roof, we have created an environment that will support the translation of scientific discoveries into meaningful advances in patient care. By moving discovery more rapidly from the laboratory bench to the patient's bedside."

Chief Executive Officer of the Medical Center
Senior Vice President for Health Affairs at Penn State
Dean of the College of Medicine

LOCUS OF INTERACTION

Both researchers and clinicians offices are located on the top two floors, with ancillary support spaces located to encourage spontaneous encounters. The design encourages communication and connectivity through the multiple scaled soft spaces such as breakout alcoves, cafes, consult rooms, and open lounge areas. Collocating clinical and research staff via contiguous offices, work rooms, and touch down stations for oncologists, patient coordinators, and clinical trial nurses further emphasizes integration. Views between the patient public spaces and the research laboratories serve as a constant reminder that researchers and oncologists are working together to find new breakthroughs; this also helps to instill confidence in patients that they are getting the most proactive and informed care possible.



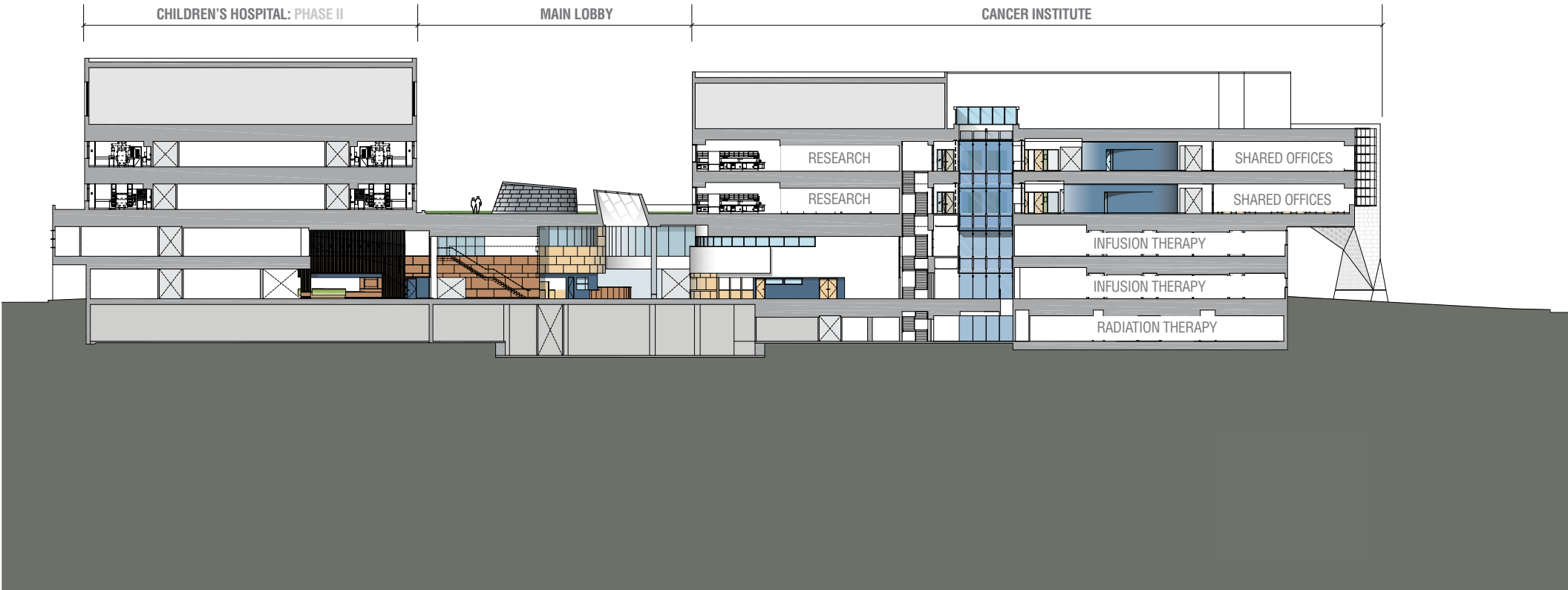
BEEHIVE SECTION

INTERLOCKING LOBBIES

A linked series of lobbies, public spaces, and green spaces define the public realm of the Children's Hospital, Cancer Institute, the Main Hospital Lobby, and the Emergency Department. The spaces are an exploration of light, color, and texture to give a more human scale to the face of the institution, while conveying a sense of transparency and warmth. While the scale of the spaces vary to accommodate different levels of privacy and activity, a consistent material palette of glass, wood, terrazzo, carpet, stainless steel, and color is used to define the public realm and the changing character of the spaces.

"We need to be conversant with our colleagues who spend all their time in the laboratory who haven't treated a patient in their entire career, as well as a clinician who doesn't know molecular biology intimately but knows patients very well. We need to be able to move back and forth, to talk with each other both formally in conferences and informally in the elevators."

Chair, Department of Radiation Oncology

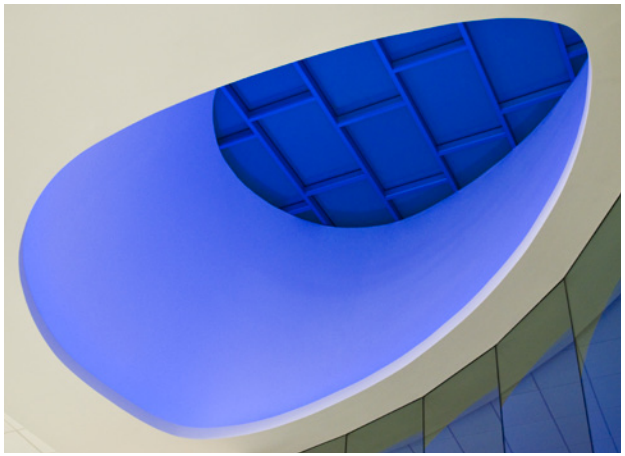


MAIN HOSPITAL LOBBY

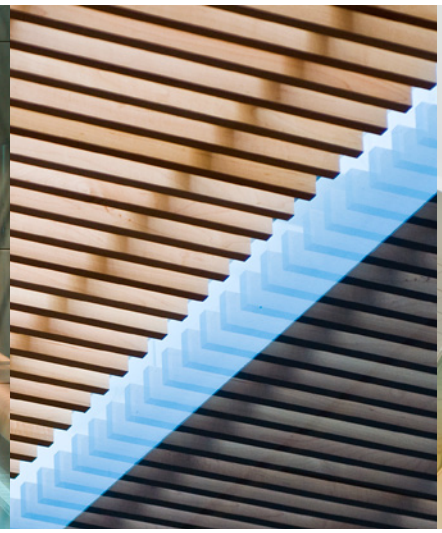
CANCER INSTITUTE LOBBY

DETAIL AND FORM

An archipelago of curvilinear forms animates the public areas, highlighting prominent features such as reception counters, planters, skylights, and waiting areas. A dramatic organically shaped skylight is located above the reception and waiting area in the main hospital lobby. Throughout the day, a changing array of light and shadow transforms its surfaces; a gentle blue artificial light replaces the daylight at night.





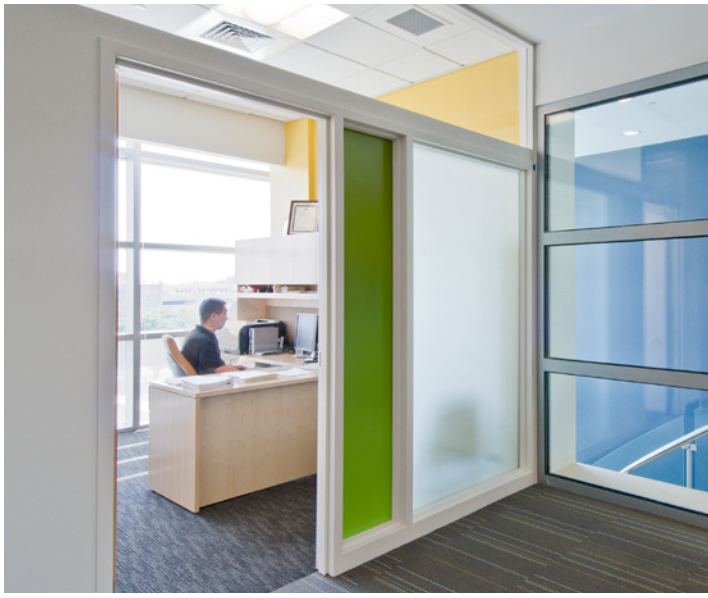



COMMMUNICATION AND CONNECTIVITY

The Beehive, a 5-level atrium, links the clinical and research functions together in a light filled space that connects all the main circulation spaces vertically and creates horizontal and vertical relationships between functions. It is the social heart of the facility and is expressive of the mission of the Cancer Institute – Translational Medicine. Faculty offices, informal conference rooms, lounges, and lunch areas are located around the Beehive in a dynamic expression of the possibilities for collaboration and cross-pollination.

"The most important focus is the collaboration between doctors, nurses, therapists and researchers. The setup makes it easier to translate the work being done by the researchers into actual treatments for patients."

Chief Operating Officer



LIGHT AND TRANSPARENCY

Access to natural light and nature are essential to the welcoming and peaceful environment of the Cancer Institute. The clinical floors include a 40–bed infusion therapy unit and outpatient clinics with family lounges oriented toward the Healing Garden. Transparent vertical surfaces allow for natural light to permeate each infusion suite. Sliding glass partitions and cubicle curtains between infusion suites allow for communication between patients, views of the healing garden, or with closed curtains, privacy, dependent upon how a patient feels on a given day.

"The new Cancer Institute is very patient centered. That was the goal and I think it was accomplished. It emphasizes how important daylight and normalcy is to patients."

Oncologist

INFUSION THERAPY

CLINIC ENTRANCE

HEALING GARDEN

INFUSION THERAPY SUITE WITH FAMILY LOUNGE

"The new building is light, airy and beautiful, which cheers me up." **Cancer Patient**

LINEAR ACCELERATOR

RADIATION ONCOLOGY WAITING AREA AND PEDIATRIC WAITING AREA BEYOND

"On Tuesday, which is lung cancer day, we have the medical oncologist, the radiation oncologist, the pulmonologist jointly schedule patients to see several clinicians in the morning; we discuss their case at noon with radiology in one of the conference rooms, and then come back to the patient that afternoon with a consensus recommendation of what we ought to do. We also bring the clinical research coordinators, people from our clinical trials group, into the clinics so they can hear us discussing the patients. We get direct feedback to link the research mission and the clinical mission."

Chair, Department of Radiation Oncology

COLOR AND TEXTURE

The top two levels of the building house the research laboratories and related support functions, which were consolidated from multiple buildings on campus. A flexible array of open labs surround a central support core, while a glazed office suite anchors the northeast corner of the building. The textural material surfaces – which oscillate from transparent to opaque, solid to void, bright colors to white – create a lively contrast to the rigid rhythm, order and scale of the lab spaces.

"It has been almost unanimous among the scientists who use this building that, even if they were apprehensive about giving up their comfortable old territory, they like the new open space."

Chair, Department of Radiation Oncology

TYPICAL RESEARCH LABORATORY

LABORATORY GHOST CORRIDOR

POST OCCUPANCY EVALUATION

90 Days Later... Impressions from key leadership:

- Reporting more scheduled and unscheduled clinician interactions
- Recognizing the importance of patient social networks during treatment
- Need to coordinate IT and staff support for smooth patient / information flow
- Proximity of Clinicians' and Researchers' offices is great
- Effective daylight control is important

270 Days Later... A post-occupancy survey of full-time institute staff:

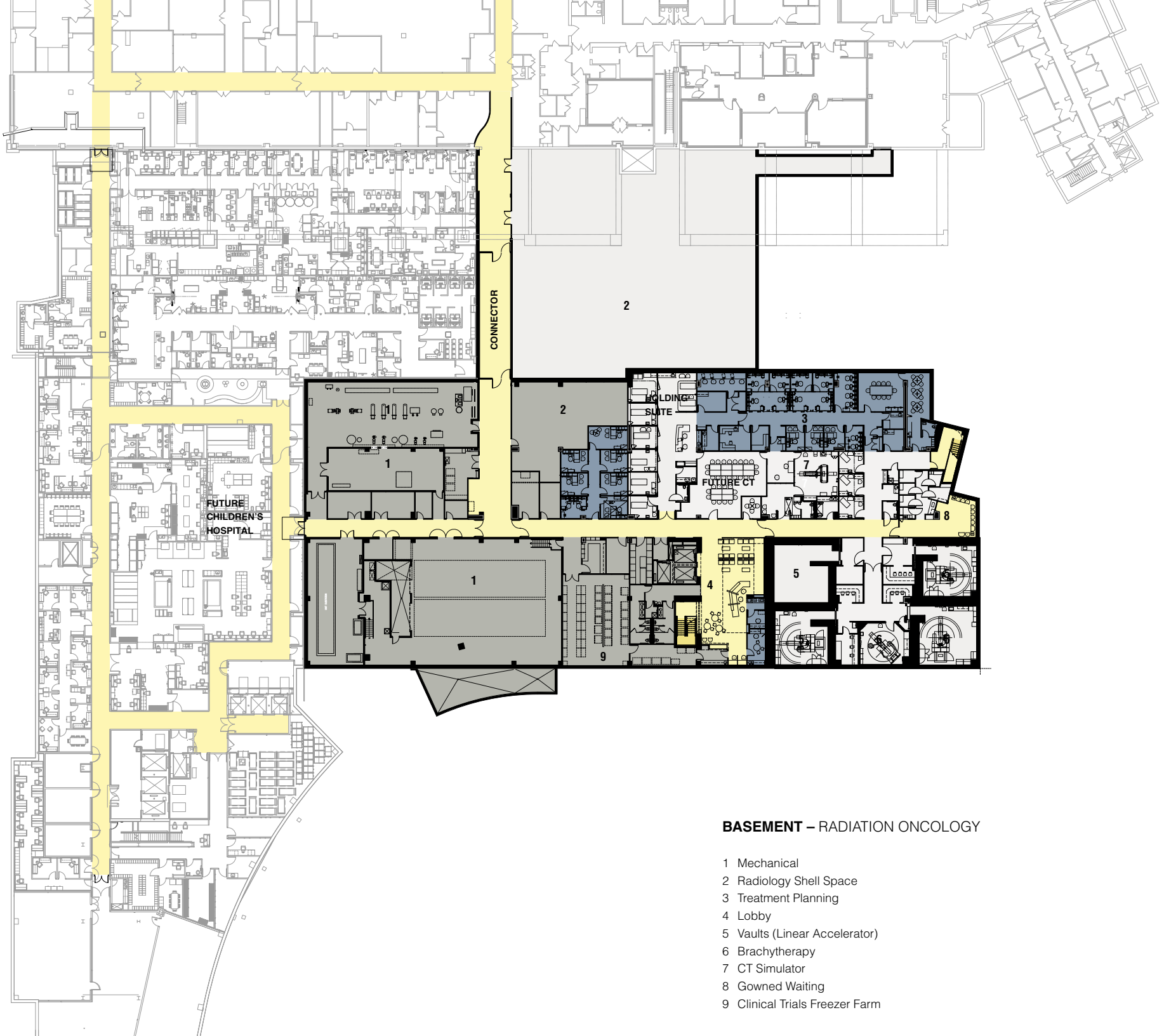
- Gardens and natural light are a benefit to patients and staff
- Organization of offices has increased interdisciplinary communication
- Provides adequate acoustic privacy in open offices and alternate work areas
- Over 50% of occupants report increase in collaboration outside of their groups
- Over 60% report that building promotes informal discussion and generating ideas

  "…makes it easier (for a researcher) to communicate with clinical trials staff"

  "…common seating is a good place to meet ad-hoc"

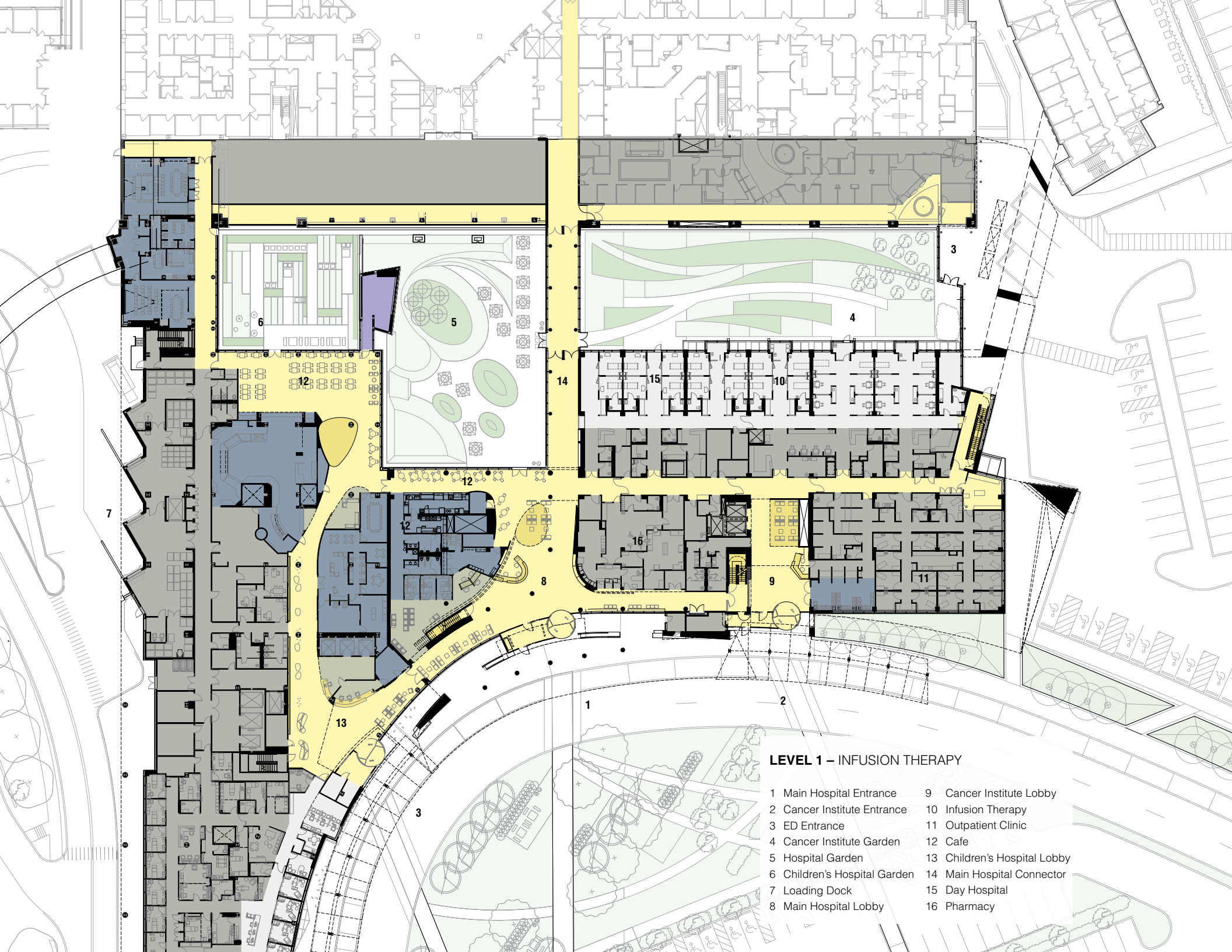
365 Days Later... Planned long-term follow-up studies:

- Architect's "shadow study" time and motion analysis of building usage
- In-depth post-occupancy evaluation of building systems and performance
- Institute's ongoing tracking of patient satisfaction scores, coauthorship rates of research papers, amount and sustainabiltiy of grant funding, quality and timing of patient referrals, tracking of patient survival rates and participation rates in clinical trials



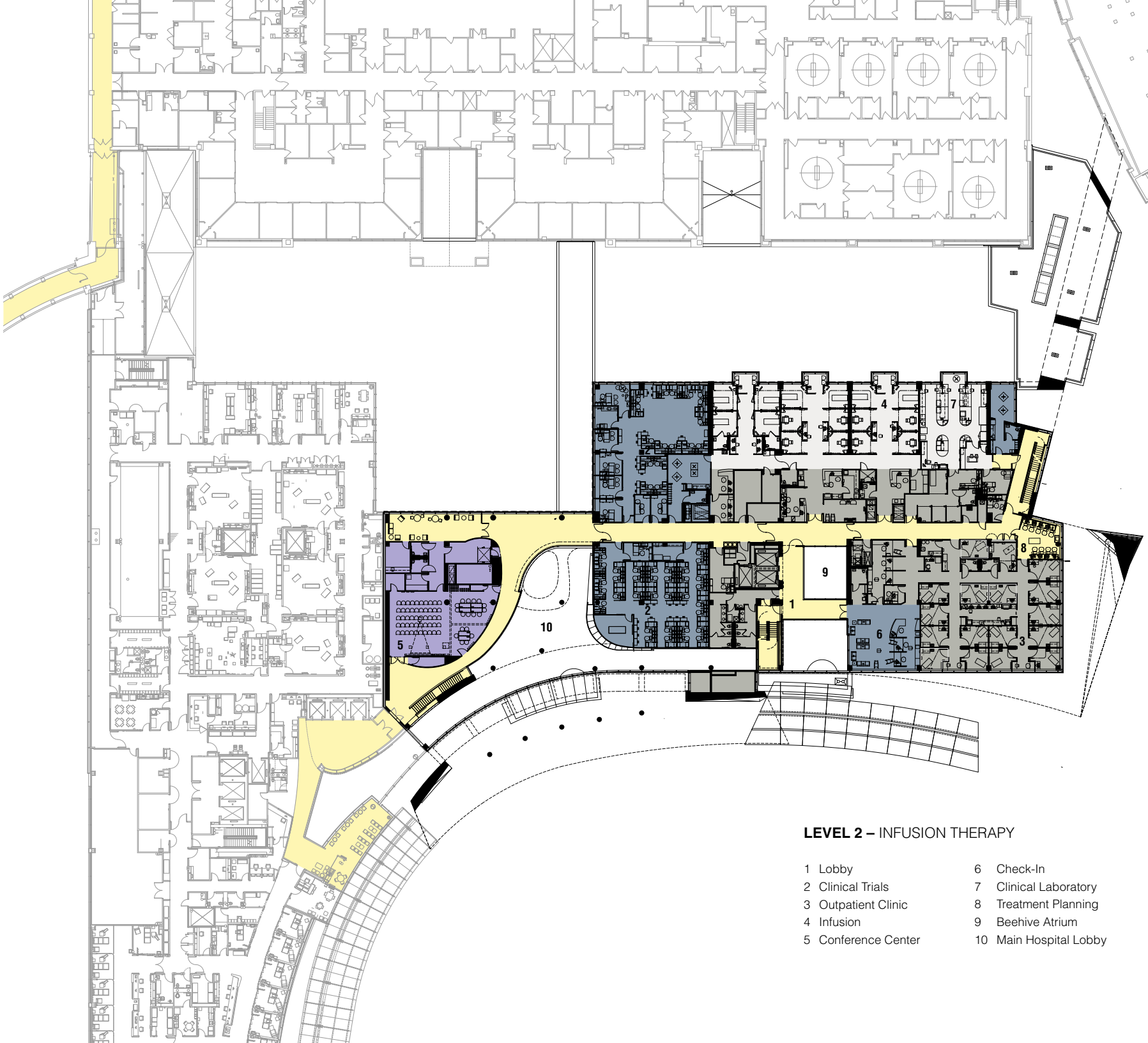
BASEMENT – RADIATION ONCOLOGY

1 Mechanical
2 Radiology Shell Space
3 Treatment Planning
4 Lobby
5 Vaults (Linear Accelerator)
6 Brachytherapy
7 CT Simulator
8 Gowned Waiting
9 Clinical Trials Freezer Farm



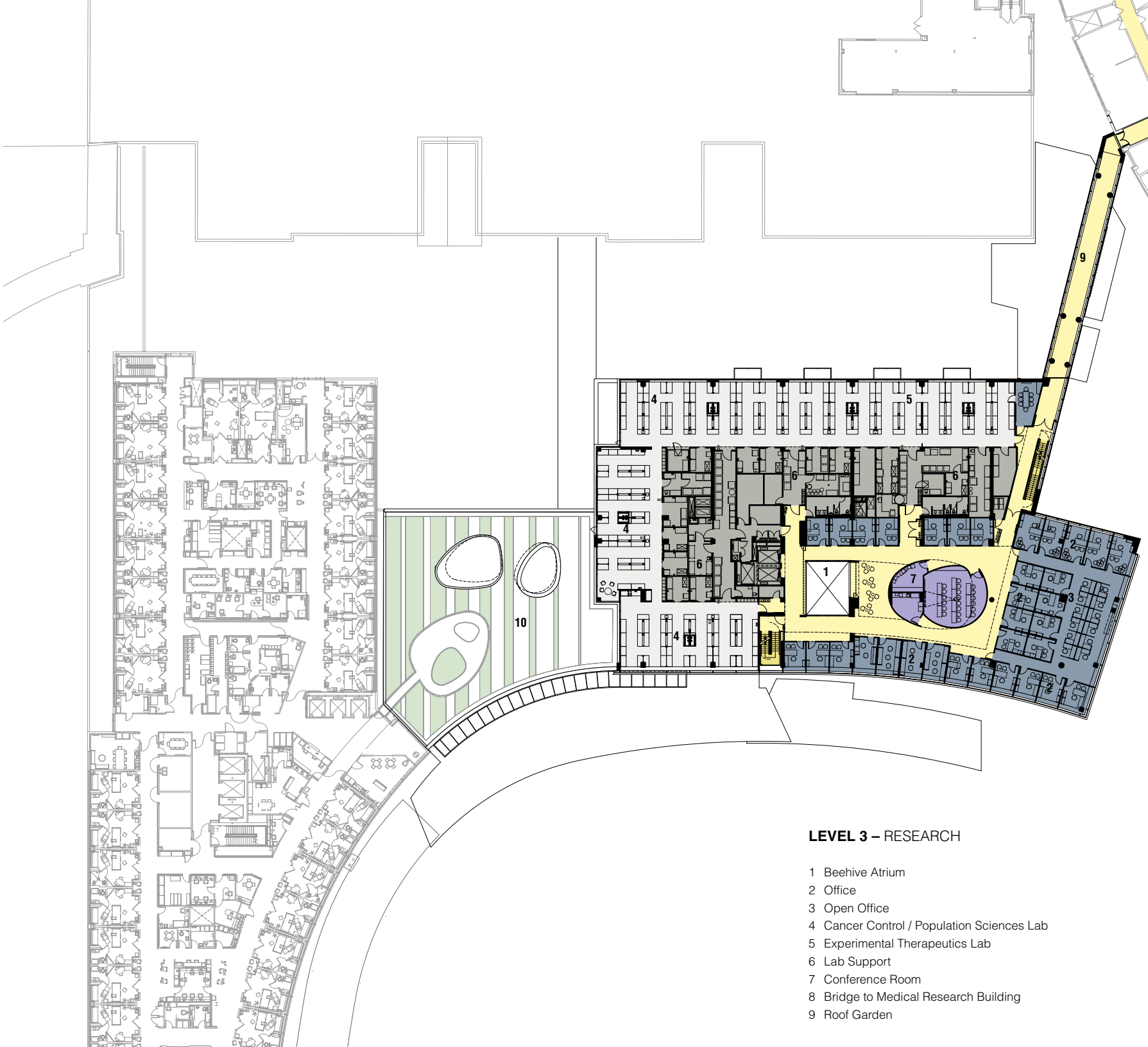
LEVEL 1 – INFUSION THERAPY

1 Main Hospital Entrance
2 Cancer Institute Entrance
3 ED Entrance
4 Cancer Institute Garden
5 Hospital Garden
6 Children's Hospital Garden
7 Loading Dock
8 Main Hospital Lobby
9 Cancer Institute Lobby
10 Infusion Therapy
11 Outpatient Clinic
12 Cafe
13 Children's Hospital Lobby
14 Main Hospital Connector
15 Day Hospital
16 Pharmacy



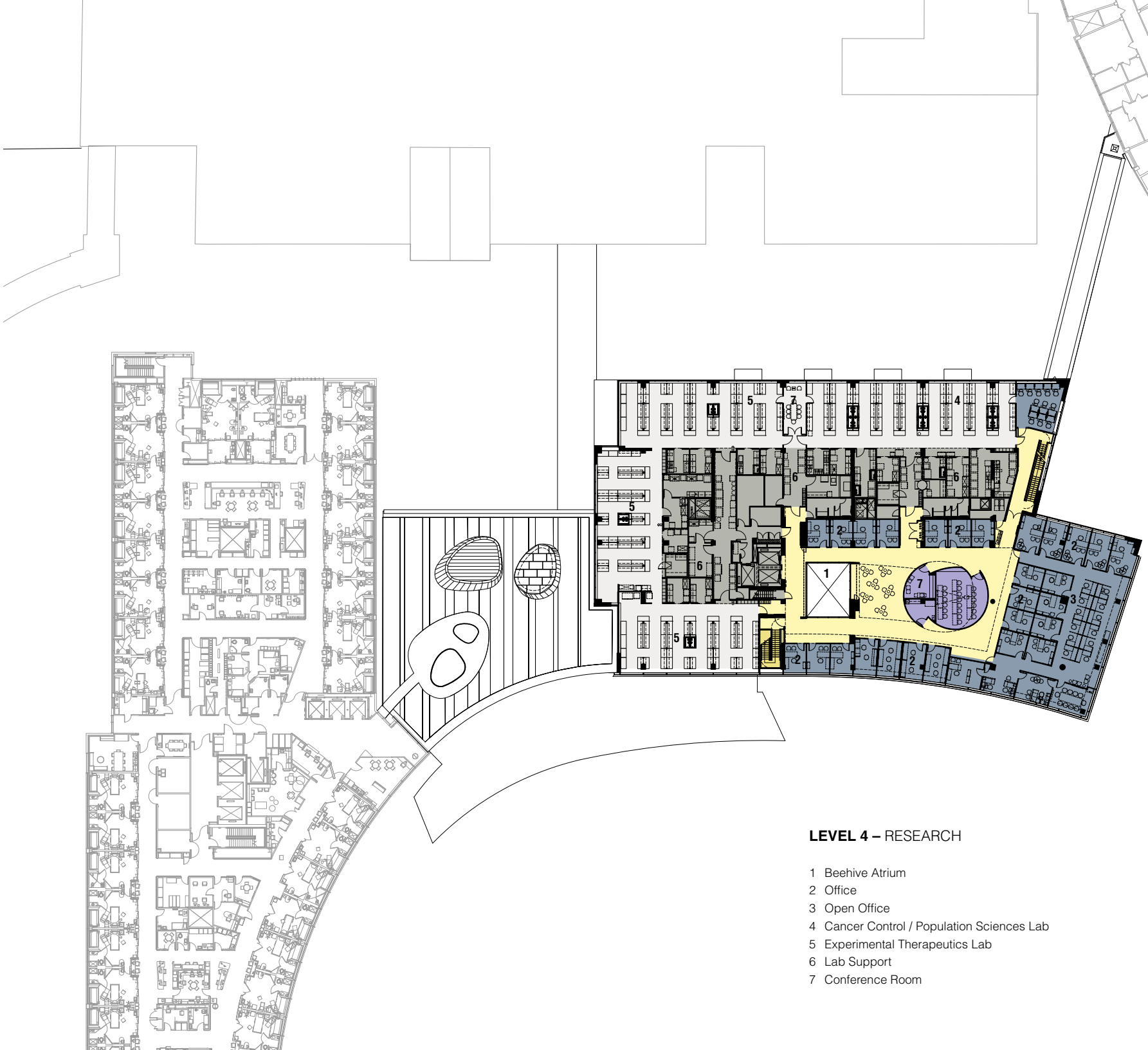
LEVEL 2 – INFUSION THERAPY

1 Lobby
2 Clinical Trials
3 Outpatient Clinic
4 Infusion
5 Conference Center
6 Check-In
7 Clinical Laboratory
8 Treatment Planning
9 Beehive Atrium
10 Main Hospital Lobby



LEVEL 3 – RESEARCH

1 Beehive Atrium
2 Office
3 Open Office
4 Cancer Control / Population Sciences Lab
5 Experimental Therapeutics Lab
6 Lab Support
7 Conference Room
8 Bridge to Medical Research Building
9 Roof Garden



LEVEL 4 – RESEARCH

1 Beehive Atrium
2 Office
3 Open Office
4 Cancer Control / Population Sciences Lab
5 Experimental Therapeutics Lab
6 Lab Support
7 Conference Room