Description of document:	National Institute of Standards and Technology (NIST) Integrated Master Plan 2020
Requested date:	24-October-2022
Release date:	10-November-2022
Posted date:	26-August-2024
Source of document:	Freedom of Information Act Officer National Institute of Standards and Technology 100 Bureau Drive - Stop 1710 Gaithersburg, MD 20899-1710 Email: foia@nist.gov

NIST INTEGRATED MASTER PLANS IMPLEMENTATION REPORT

NIST GAITHERSBURG CAMPUS & BOULDER LABORATORIES
June 2020

NIST INTEGRATED MASTER PLANS IMPLEMENTATION REPORT FOR GAITHERSBURG CAMPUS AND BOULDER LABORATORIES

June 2020

Prepared by
The Urban Collaborative

for the
National Institute of Standards and Technology (NIST)
Gaithersburg, MD and Boulder, CO

under contract
SB134118CQ0010
Task Order 1333ND19FNB195196

Cover image: Aerial Photo of Gaithersburg Campus (left) Aerial Photo of Boulder Campus (right)

Intentionally Left Blank

TABLE OF CONTENTS

NOTE: **APPENDIX: DETAILED COST ESTIMATES** is a stand-alone document.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The National Institute of Standards and Technology (NIST) Integrated Master Plans Implementation Report (Integration Plan) documents the implementation of capital improvements from both the Boulder Laboratories Master Plan (2017) and the NIST Gaithersburg Campus Master Plan (2018).* The purpose of this plan is to prioritize the projects between both Campuses (Boulder and Gaithersburg), to support annual capital budget requests, and to provide a master schedule for the major capital improvement projects. This report also provides NIST's compliance with the Department of Commerce's requirements to develop a strategic portfolio management approach.

"All Agencies within the Departments shall implement a portfolio management approach in the administration of its real property assets, which includes applying a holistic, ***strategic perspective*** *in real property decision-making; and development of Portfolio Ten Year Plans"*

- Department of Commerce Real Property Management Manual, August 2014

*The full NIST Master Plans may be found at https://www.nist.gov/ofpm

NIST promotes U. S. innovation and industrial competitiveness by advancing measurement science, standards, and technology to support and enhance commerce and economic security. The agency operates in two primary locations: a 579-acre headquarters Campus in Gaithersburg, Maryland, and a 206-acre Campus in Boulder, Colorado, with other facilities in Fort Collins, Colorado, and Kauai, Hawaii. All of the NIST locations have significant historic preservation considerations. Investment is needed for facility maintenance, rehabilitation and modernization in order for NIST to continue providing these vital services and functions to the Nation. Current fiscal realities, coupled with areas of deteriorating infrastructure and aging facilities, suggest that a top-down capital investment strategy would best enable NIST to strategically plan for and manage its real property assets in support of its measurement science and research mission.

The Integration Plan is divided into four major sections by chronology and location.

1. *Executive Summary*: briefly describes key elements of the report including the intentions of the NIST senior leadership, a strategy for integrating the project delivery schedules for priority projects, and a summary of the Capital Investment Strategy.
2. *Priority Projects*: identifies the top 11 projects between the Boulder and Gaithersburg Campuses which represent NIST's highest priorities. This close look provides escalated cost estimates for each project along with a detailed project delivery schedule.

3/4. *Gaithersburg Projects* and *Boulder Projects*: identify the remaining projects on each Campus without prioritization. These projects are presented with cost estimates in 2020 dollars (without escalation) and detailed project delivery schedules.

The planning team developed the Integration Plan through a series of planning and programming activities, cost estimate calculations, and project delivery schedule assessments. They presented alternative strategies to sequence projects to the Senior Leadership and discussed recommendations that assessed pros and cons. Senior Leadership reviewed these considerations, augmented and adjusted the prioritization, and presented a final sequence of priority projects to the NIST Director. The approved final prioritized project list follows:

Priority Projects:

1. **GAITHERSBURG – CONSTRUCT RESEARCH BUILDING I**
2. **BOULDER – CONSTRUCT BUILDING 3 ADDITION**
3. **GAITHERSBURG – BUILDING 101 LOWER LEVELS RENOVATION & CONSTRUCT ADDITION**
4. **GAITHERSBURG – BUILDING 221 (GPL) RENOVATION & CONSTRUCT ADDITION**
5. **BOULDER – CONSTRUCT RESEARCH BUILDING A (REPLACE BUILDING 2)**
6. **GAITHERSBURG – CONSTRUCT GATE F SHIPPING/RECEIVING/INSPECTION**
7. **GAITHERSBURG – BUILDING 220 (GPL) RENOVATION**
8. **BOULDER – CONSTRUCT REPLACEMENT CHILDCARE CENTER (BUILDING 26)**
9. **GAITHERSBURG – BUILDING 223 (GPL) RENOVATION**
10. **BOULDER – BUILDING 24 CAMPUS CENTER RENOVATION**
11. **GAITHERSBURG – BUILDING 225 (GPL) RENOVATION**

In order to develop a comprehensive plan for implementation of the NIST Gaithersburg and Boulder Master Plans, NIST has recommended a capital revolving Facilities Modernization Fund to provide a consistent stream of annual funding that allows the highest level of program planning efficiency in modernizing

NIST's aging facilities and utility infrastructure in the fastest and most economic manner. This Integration Plan is based on two alternative levels of consistent annual funding to accomplish this goal; $60M or $80M in Construction of Research Facilities (CRF) funding.

While developing this Plan, two different funding approaches were analyzed. The first approach evaluated the recommended alternative annual funding levels of $60M and $80M at a steady, but flat, rate through the life of the program, while applying 3% escalation per year to the project cost estimates (an industry standard approach to construction project cost estimating). The second approach escalated the $60M and $80M annual funding levels at the same 3% rate as the project estimates. The flat, non-escalated, $80M per year resulted in the eleven priority projects being projected to be completed by FY2069. The flat $60M per year resulted in the last three priority projects never getting funded as the annual funding could not keep up with the escalation rate after the eighth project. Comparatively, when the $80M annual funding is escalated at the same rate as the project estimates per the second approach, the priority projects are completed in 26 years, and when the $60M annual funding is escalated, the priority projects are completed in 34 years. Based upon this initial estimating exercise and review, it was determined that the $80M and $60M annual funding projections would be based on the assumption that Congress would provide the funding levels escalated annually to match inflation and they would not, therefore, be held "flat" over time.

In addition to CRF funding, NIST has requested a consistent stream of annual operations and maintenance funding to reduce the deferred maintenance backlog. Consequently, the Integration Plan is based on planning for certain aspects of the Master Plans to be funded via the Safety, Capacity, Maintenance and Major Repair (SCMMR) funding source. Some of these projects are also identified within this Plan. While NIST is requesting an annual SCMMR funding stream of $120M, the portions indicated in this report that are specific to master plan integration projects are listed as $5M or $7M annually. These amounts may be increased based on the reduction of the deferred maintenance backlog through increased annual funding for facility modernizations, but are shown as the minimum level of funding anticipated initially.

Based upon the CRF and SCMMR recommendations, NIST is requesting a total of $180M-$200M annually, with the CRF request being constant but adjusted upwards to match inflation, until completion of the NIST Master Plans. Note: As major projects are completed, corresponding portions of the maintenance backlog will be reduced. It is, therefore, anticipated that the SCMMR funding could start to be reduced in 15-20 years.

Significant costs in the Master Plans are for the replacement and needed capacity increases of the underground utility infrastructure at both Campuses. These projects will be a major source of increased spending levels of SCMMR funds that could be 50%+ of annual SCMMR funding. Since the replacement of the aging underground utility infrastructure is being developed as its own significant program, it is not addressed as part of this Integrated Implementation Plan report.

*The difference in receiving annual appropriations of $80M versus $60M results in an overall savings of approximately **8 years** and **$477,566,308**.*

Nearly all the projects in this Integration Plan are based upon a Design-Build (DB) delivery model which has a proven track record for savings in both time and costs over the traditional Design-Bid-Build (DBB) approach. Only the smallest projects in this Plan are anticipated to be accomplished through the DBB delivery model. For the top 11 Priority Projects (funded at the $80M/year level), NIST anticipates saving 8 years and $477,566,308 in completing these projects.

It was the intent of NIST Senior Leadership to develop a list of the top 10-12 projects from the Gaithersburg and Boulder Master Plans in an integrated manner, and then determine the overall project prioritization for annual budget requests. Over the course of several months, Leadership met to discuss the projects from the Master Plans and determined the top 5 projects per Campus. These meetings culminated in an integrated prioritized list of projects and an 11th was added for the final prioritized list.

This Integration Plan documents NIST's capital project priorities across both Campus locations including the General Purpose Laboratory Buildings (GPLs) Modernization Program which consists of the renovation of nearly 1.3 million Gross Square Feet (GSF) and construction of 86,000 GSF as additions to the GPL facilities. The seven original GPLs comprise more than 45% of the research space on the Gaithersburg Campus, house a variety of laboratories and research programs, and are used by all the NIST Laboratory Organizations. Past assessments have documented significant infrastructure and spatial deficiencies that can only be resolved through a full gut and renovation process, necessitating that each GPL facility be completely emptied before it can be renovated. While Research Building I is required for future growth capacity within NIST, it is prioritized first solely to provide needed swing space to initiate the GPL Modernization Program. Due to the significant cost for the construction of Research Building I, NIST Senior Leadership has also been exploring alternatives such as building swing space in a leased facility to enable the GPL Modernization Program to begin sooner. If the leased facility swing building option is deemed viable, the renovation of Building 221 will move up to be the top prioritized project.

*The projects were evaluated on their **condition**, **cost and schedule efficiency**, **user concerns**, and **impacts** upon other projects. The emphasis is on the first ten to twelve projects that cover an implementation schedule of twenty to thirty years.*

Whereas the most critical aspect to the Gaithersburg Master Plan sequencing is the GPL Modernization Program, the most critical aspect for the Boulder Master Plan is the need for high-bay swing space. The creation of new high-bay space would facilitate the construction of new research space to replace existing aged and failing facilities.

Descriptions follow for each key project in both Master Plans. In these descriptions, specific attention has been given to the Facility Condition Index (FCI) rating. The FCI rating is defined as current maintenance, repair, and replacement deficiencies of the facility divided by the current replacement value of the facility. The higher the number, the lower the condition of the facility.

The dates in the chart below are the dates of the last inspection of these facilities and the resulting FCI rating. FCI ratings are differentiated by building type. For laboratory buildings (all but Building 101) an FCI of 90+ is considered good, between 80-89 is considered fair, and less than 80 is considered poor. For office buildings (only Building 101) an FCI of 80+ is considered good, between 70 and 79 is considered fair (shown in yellow), and less than 70 is considered poor (shown in red).

NOTE: A new round of inspections were conducted between November 2019 and February 2020 that will result in updated FCI values (available shortly after the publication of this report).

SITE	DATE	EXISTING FACILITY	FCI[1]
Gaithersburg	2013	Building 101	62.51
Gaithersburg	2013	Building 221 (GPL)	77.09
Gaithersburg	2014	Building 220 (GPL)	71.24
Gaithersburg	2013	Building 223 (GPL)	68.41
Gaithersburg	2013	Building 225 (GPL)	82.52
Boulder	2016	Building 1	45.26[1]
Boulder	2016	Building 2	29.30
Boulder	2016	Building 24	(-8.73)[2]
Boulder	2016	Childcare Center (B26)	88.67

[1] FCI is for the lobby, auditorium, and library.

[2] It may be less expensive to demolish Building 24 and construct a new building versus repairing and renovating the existing facility.

Key Projects at Gaithersburg:

RESEARCH BUILDING I

The Research Building I project is the construction of a 300,000 GSF advanced physical science research laboratory. This facility will allow one or more GPLs to be vacated for efficient renovation. Details about this project can be found on page 23.

BUILDING 101 LOWER LEVELS (B101)

The Administration Building (B101), includes an eleven-story office tower for much of NIST's senior leadership and administrative staff, and its large first floor and basement levels house NIST's central public and staff support spaces. The Building 101 Lower Levels project includes renovation to select portions of the basement and first floor levels, and the construction of a 50,000 GSF addition. The addition will support the expansion of NIST's mission-critical conference center and creation of office swing space in support of renovation of the office tower, which has been separately planned for one or two floors at a time using SCMMR funding. The entire Building 101 complex is in poor condition and its FCI is among the worst on the Gaithersburg Campus at 62.51. Details about this project can be found on page 31.

GENERAL PURPOSE LABORATORY BUILDING 221 (B221)

The Building 221 project includes the renovation of 219,654 GSF and the construction of a 28,000 GSF addition to the facility. The FCI is considered poor at 77.09. Building 221 is targeted as the first of the GPLs for renovation as it is the largest and, with the planned addition, will result in the most available space of any modernized GPL. This will provide NIST with more flexibility in moving people and program space to prepare for the next GPL renovations and to successfully deliver the GPL Modernization Program. Details about this project can be found on page 35.

GATE F SHIPPING/RECEIVING/INSPECTION

This project includes the construction of approximately 17,000 GSF for two new facilities and associated roadways near Gate F (off Muddy Branch Road). This project is critical for improving NIST's site security by creating a new commercial vehicle entrance and inspection facility, and the construction of a new shipping and receiving facility will enable NIST to restrict commercial vehicle access to the Campus. Details about this project can be found on page 43.

GENERAL PURPOSE LABORATORY BUILDING 220 (B220)

This project is the renovation of 216,040 GSF into advanced physical science research laboratories and support spaces. The FCI is considered poor at 71.24. Details about this project can be found on page 47.

GENERAL PURPOSE LABORATORY BUILDING 223 (B223)

This project is the renovation of 164,659 GSF. The FCI is poor at 68.41. It is currently planned to be renovated to house the NIST Central Computing Facility (currently in Building 225), a high-performance computing center, and related support spaces and offices. Details about this project can be found on page 55.

GENERAL PURPOSE LABORATORY BUILDING 225 (B225)

This project is the renovation of 204,332 GSF into advanced physical science research laboratories and support spaces. The FCI is fair at 82.52. The NIST Central Computing Facility is currently located in Building 225. Therefore, a new computing/data center must be constructed, and these functions moved, as a predecessor project before the renovation of 225 can begin. These functions are planned to be relocated into the renovated Building 223, but that decision could change based upon a review of the placement on Campus for primary and back-up data centers from a Campus distribution perspective. Detail can be found on page 63.

Key Projects at Boulder:

BUILDING 1 WINGS 5 & 4

The Wing 5 renovation project was awarded as a design-build project in late March 2020. This includes the renovation of 74,668 GSF and the construction of 4,500 GSF. The project awarded has options for the renovation of Wing 4 and the partial (west) spine between Wings 3 and 6. Due to the significant savings in the awarded contract versus the anticipated cost, there is sufficient funding already received to also award the renovation of Wing 4. This includes the renovation of 22,396 GSF and the construction of 4,500 GSF. Wing 4 serves as prime lab space for vibration sensitive work due to its slab-on-grade construction, and its renovation will significantly improve opportunities for providing modern research space and additional flexibility in space utilization across the Boulder Campus. Since the Wing 5 and

Wing 4 renovation projects have already been funded, they are not included in this Integration Plan. However, they impact the sequencing of other projects included in the Plan because these areas will facilitate moves or serve as swing space for renovation or new construction projects in Building 1 and elsewhere on the Campus.

BUILDING 3 ADDITION

This project is the construction of a 17,500 GSF addition to the existing Building 3. The addition is intended to house high-bay space research functions currently located in Building 1 (West Spine between Wings 3 and 6) and Building 24 in support of 5G research. This project is required as a predecessor project to allow the relocation of programs that require high-bay space which then allows for the renovation of Building 1 West Spine (thus completing the renovation of the full space of the west half of Building 1) and Building 24. Details about this project can be found on page 27.

RESEARCH BUILDING A

This project replaces Building 2 with the construction of a 90,000 GSF advanced physical science research laboratory building and connected parking facility, and includes the demolition of Buildings 2, 2A, and 91. The FCI for Building 2 is very poor at 29.30. This project will require phased demolition of Building 2 in conjunction with construction of Research Building A, as Building 2 houses high-bay space that must have its existing research functions moved directly into new space. This careful sequencing will be a key focus in this project. Research Building A is approximately 20,000 GSF larger than Building 2 to account for modern infrastructure and other programmatic requirements. Details about this project can be found on page 39.

BUILDING 24 CAMPUS CENTER

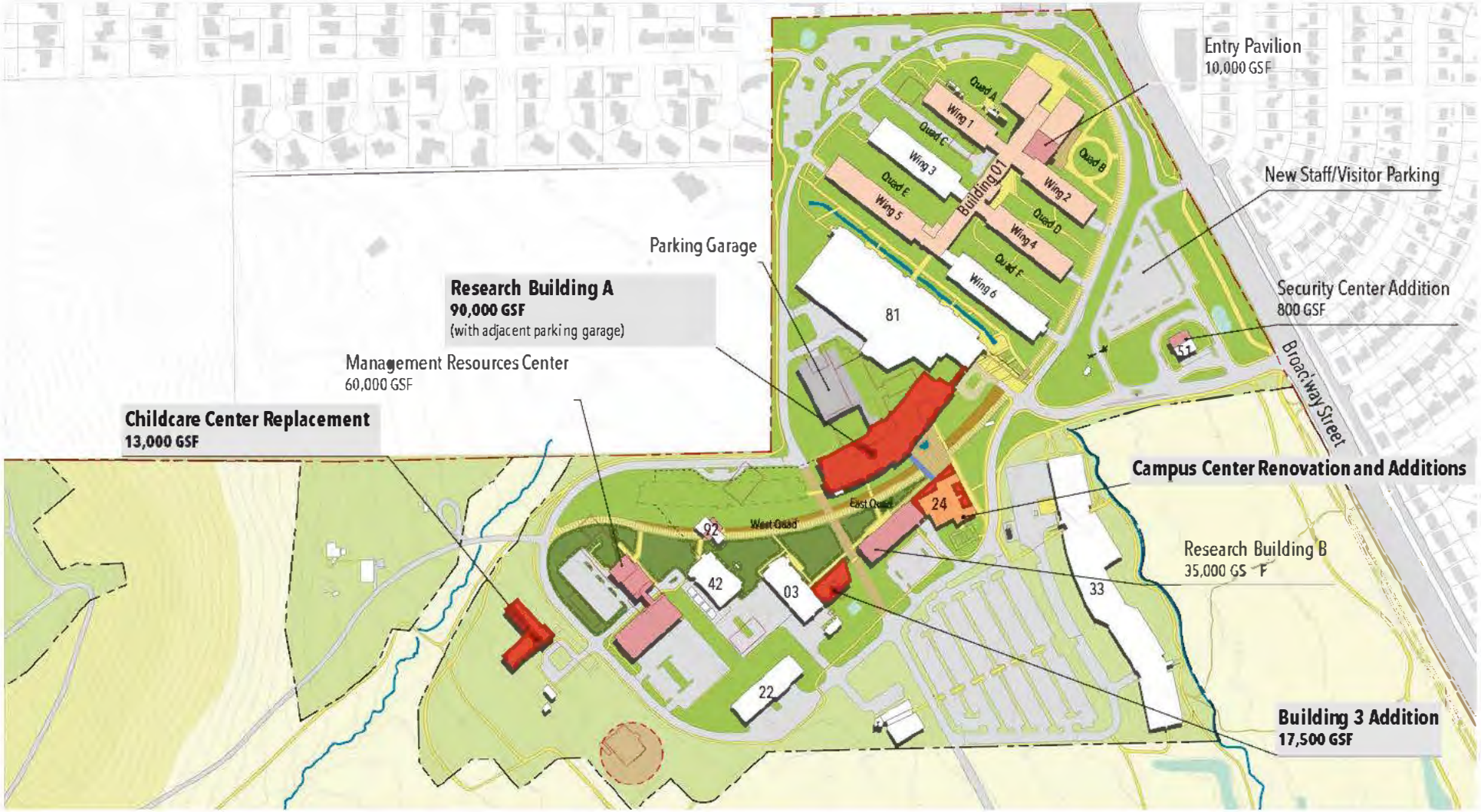
This project is the renovation of 32,723 GSF and infill construction of 3,000 GSF. The building is in a failing state as the FCI is -8.73, and NIST plans to vacate it as soon as logistically possible. However, it can only be fully vacated after the Building 3 addition is constructed and the Building 1 renovations are completed, as these projects provide the relocation capabilities for all office, laboratory, and high-bay space needs currently in Building 24. This Campus Center project is important, as it provides a central gathering space for collaboration and services on the Boulder Campus that do not currently exist. Details about this project can be found on page 59.

CHILDCARE CENTER

This project is the construction of a new 13,000 GSF Child Care Center and the subsequent demolition of the existing one. The existing Child Care Center is a well-maintained "temporary trailer" facility that is thirty years old and well past its useful life. Details about this project can be found on page 51.

Intentionally Left Blank


Electrical Substation
5,400 GSF
Cooling Tower
Chilled Water Plant Addition
6,200 GSF
NCNR Expansion
138,000 GSF
SRM Facility
54,000 GSF
Parking Structure
720 Spaces, 4 Levels
Research Buildings II, III, IV
480,000 GSF
Quince Orchard Road
Gate/Road Closure
Research Building I
300,000 GSF
High-Bay
16,000 GSF Addition
Strong Floor Facility
15,000 GSF
Gate A Security/Visitor Center
3,000 GSF Addition
Center Drive
West Drive
North Drive
South Drive
East Drive
West Diamond Ave
Solar Field
Wind/Fire Facility
15,000 GSF
Muddy Branch Road
Gate F Shipping/ Receiving/Inspection
17,000 GSF
Gate F Visitor Center
4,400 GSF
B207 Addition
17,000 GSF
Building 101 Addition
50,000 GSF
Building 101 Lower Levels Renovation
I-270 Washington National Pike
Reforestation
Buildings 220, 221, 223, 225 Renovation
B245 Addition/Renovation
Currently Under Construction
AML Expansion
115,000 GSF
GRAPHIC LEGEND
Property Boundary
Elevation Contours
Fencing
Pavement
Existing Facility to Remain
Demolished Facility/Pavement
Proposed Reforestation
Renovated Facilities
Priority Renovated Facility
Non-Priority Renovated Facility
Proposed Facilities
Priority Proposed Facility
Non-Priority Proposed Facility
*Bold text refers to priority projects
0
400ft
800ft
1200ft
1600ft
2000ft



GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Fencing
- Pavement
- Existing Facility to Remain
- Demolished Facility/Pavement
- Solar Field

Renovated Facilities

- Priority Renovated Facility
- Non-Priority Renovated Facility

Proposed Facilities

- Priority Proposed Facility
- Non-Priority Proposed Facility
- Recommended Future Laboratory Building

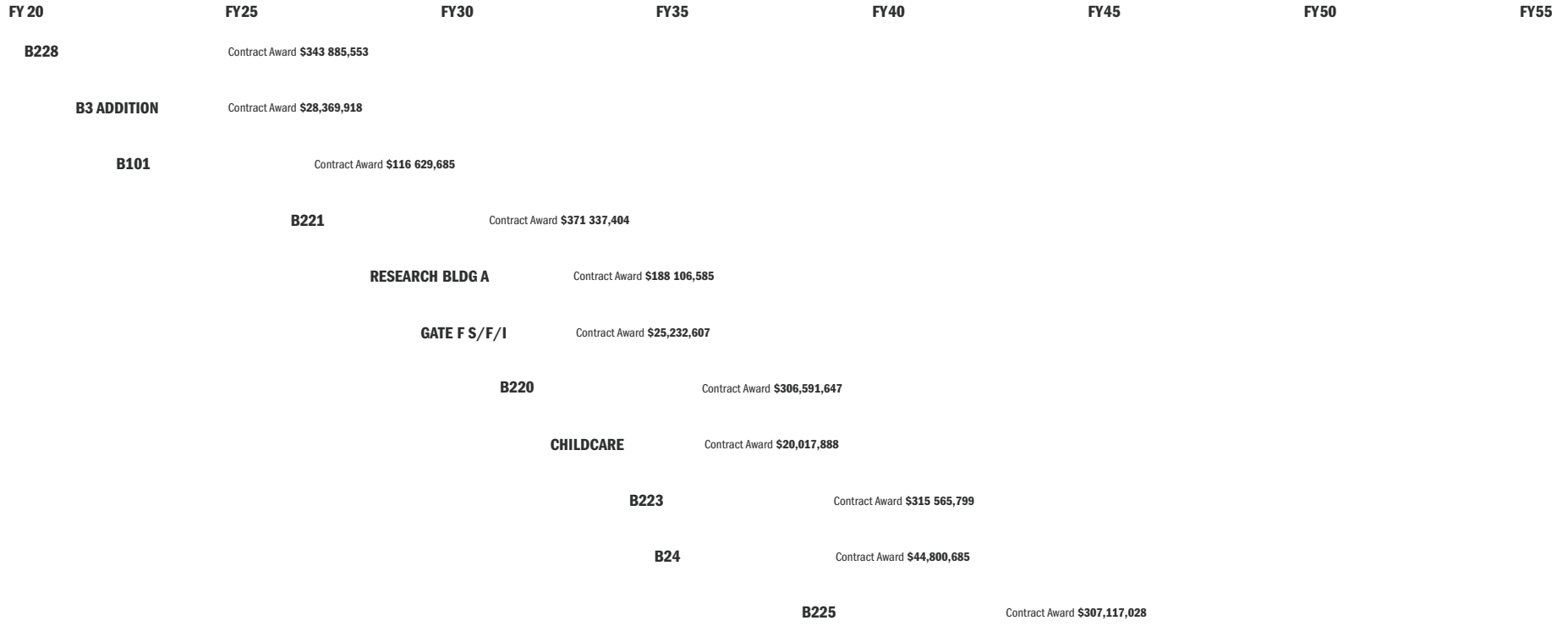
0 225ft 450ft 675ft 900ft 1,125ft

*Bold text refers to priority projects

CAPITAL INVESTMENT STRATEGY

CONSTRUCTION OF RESEARCH FACILITIES (CRF) FUN ED PROJECTS $80M ANNUAL APPR PRI T O

An annual funding stream of $80M would allo om io the eleven priority projects in 26 years, if initia in 2 0. ce the funding for the full costs of a project are ac ed, n th project delivery contract can be awarded. However, initial project planning and procurement tasks can proceed to prepare for the project award before the funds are accrued. All eleven priority projects are modeled on a DB project delivery method. The DB m o a e ates the co tion edule by 36 r th trad i na B method accord to road tu of t des and nstr ion industry Desig d In e Am ca (2019). The same study also found that when comparing the project duration (starting with design through final completion), DB projects were delivered 102% faster than DBB projects. This accelerated project delivery provides the potential for considerable due to significantly less cost escalation and, where applicable, reductions in financing costs. In the chart below, the ty project schedules are depicted and spending is shown along the X-axis. The escalation rate is 0% through FY2025 and 3% thereafter. The total cost for the priority projects funded through an annual appropriation of $80M is $2,031,150,975.



GRAPHIC LEGEND

Program of Requirements Phase
Procurement Phase
Design-Build Phase
Furniture, Fixtures, and Equipment + Moves Phase

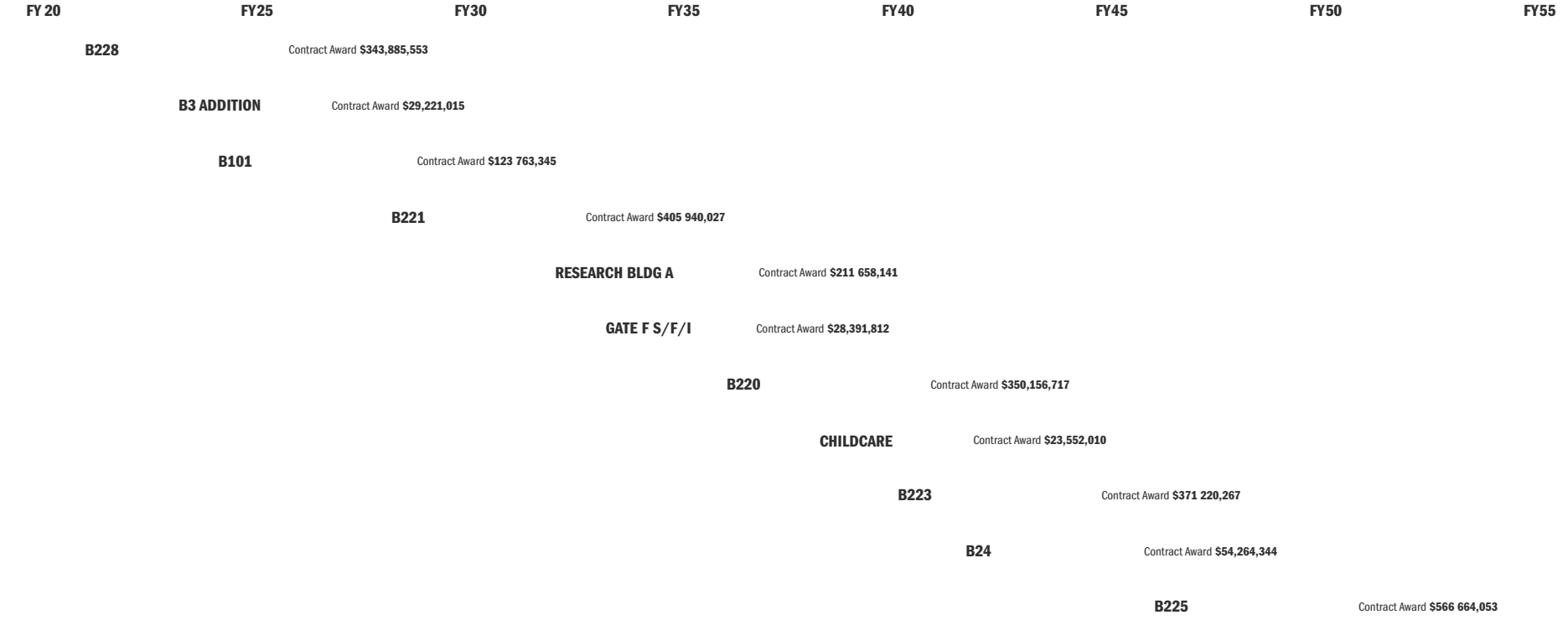
*Funding to occur every April 15

*Projects scheduled so that all funds are available prior to award of contract

CAPITAL INVESTMENT STRATEGY

CONSTRUCTION OF RESEARCH FACILITIES (CRF) FUNDED PROJECTS $60M ANNUAL APPROPRIATION

An annual funding stream of $60M would allow the completion of the first eight priority projects in 34 years, if initiated in 2020. Once the funding for the full costs of a project are accrued, then the project delivery contract can be awarded. However, initial project planning and procurement tasks can proceed to prepare for the project award before the funds are accrued. All eleven priority projects are modeled on a DB project delivery method. The DB method accelerates the construction schedule by 36% over the traditional DBB method according to a broad study of the design and construction industry by the Design-Build Institute of America (2019). The same study also found that when comparing the project duration (starting with design through final completion), DB projects were delivered 102% faster than DBB projects. This accelerated project delivery provides the potential for considerable savings due to significantly less cost escalation and, where applicable, reductions in financing costs. In the chart below, the priority project schedules are depicted and spending is shown along the X-axis. The escalation rate is 0% through FY2025 and 3% thereafter. The total cost for the priority projects funded through an annual appropriation of $60M is $2,508,717,283.



GRAPHIC LEGEND

Program of Requirements Phase
Procurement Phase
Design-Build Phase
Furniture, Fixtures, and Equipment + Moves Phase

*Funding to occur every April 15

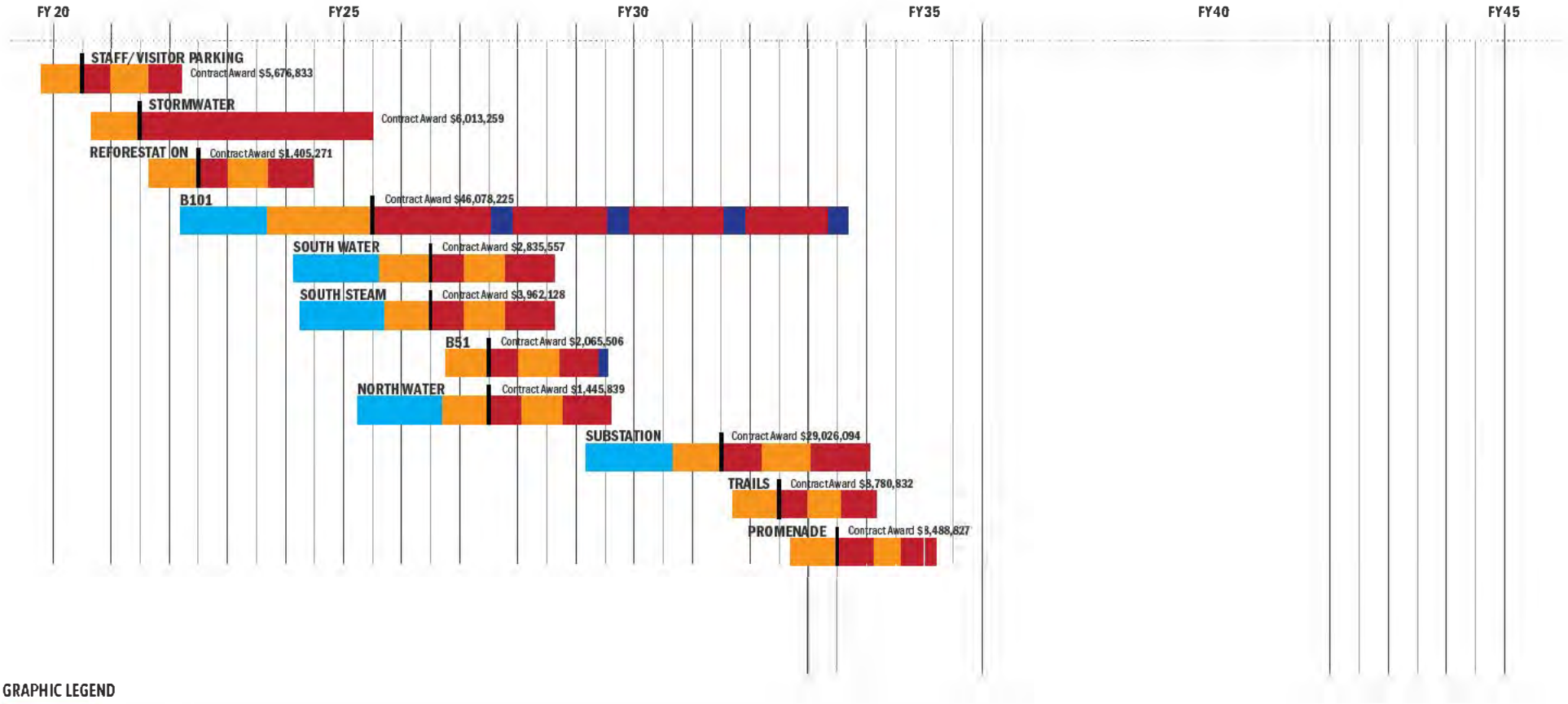
*Projects scheduled so that all funds are available prior to award of contract

CAPITAL INVESTMENT STRATEGY

SAFETY, CAPACITY, MAINTENANCE, & MAJOR REPAIRS (SCMMR) FUNDED PROJECTS

$7M ANNUAL APPROPRIATION

An annual funding stream of $7M would allow the completion of the eleven SCMMR projects in 16 years, if initiated in 2020. Once the funding for the full costs of a project are accrued, then the project delivery contract can be awarded. However, initial project planning and procurement tasks can proceed to prepare for the project award before the funds are accrued. Most SCMMR projects are modeled on a DBB project delivery method with the exception of B101 Tower Renovation, which follows a Design-Build project delivery method. In the chart below, the project schedules are depicted and spending is shown along the X-axis. The escalation rate is 0% through FY2025 and 3% thereafter. The total cost for the priority projects is $95,025,410.



GRAPHIC LEGEND

- Program of Requirements Phase
- Procurement Phase
- Design-Build Phase
- Furniture, Fixtures, and Equipment + Moves Phase

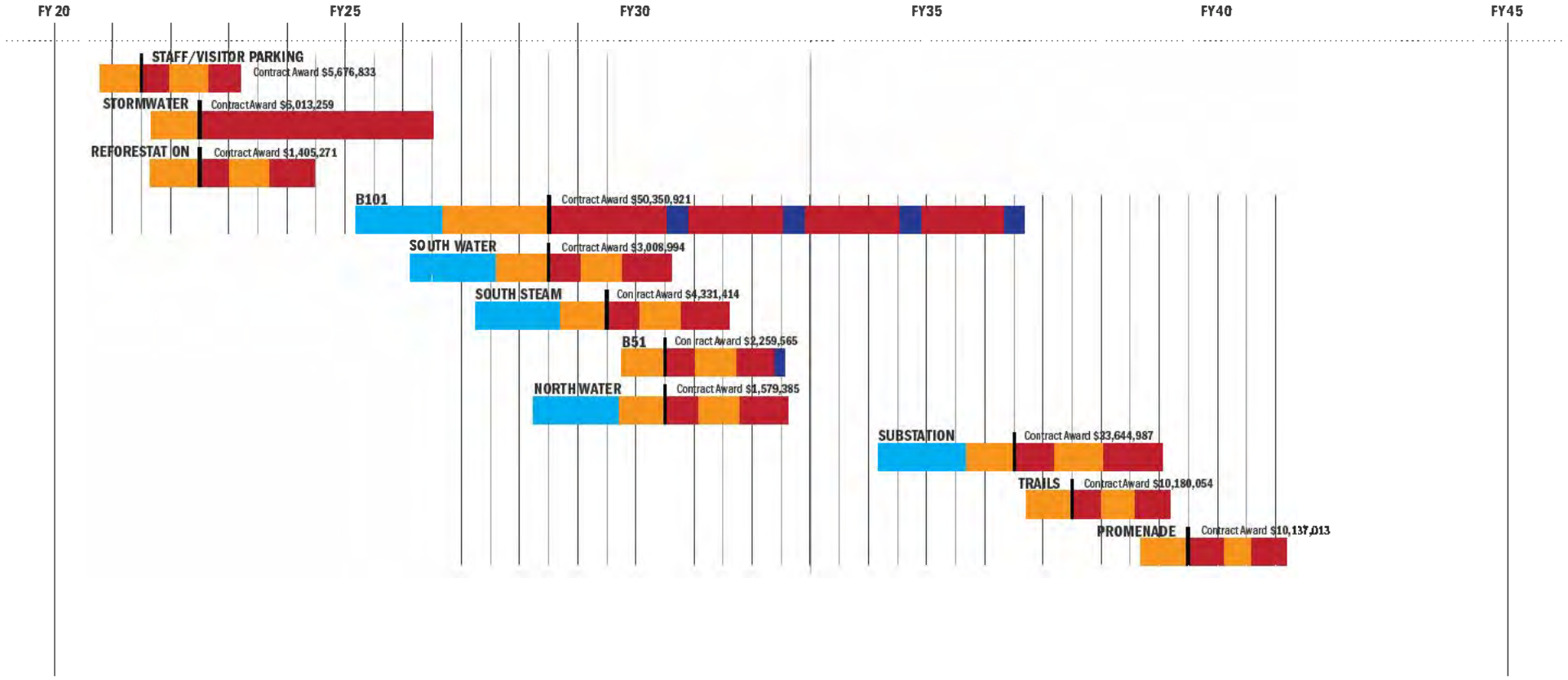
*Funding to occur every April 15

*Projects scheduled so that all funds are available prior to award of contract

CAPITAL INVESTMENT STRATEGY

SAFETY, CAPACITY, MAINTENANCE, & MAJOR REPAIRS (SCMMR) FUNDED PROJECTS $5M ANNUAL APPROPRIATION

An annual funding stream of $5M would allow the completion of the eleven SCMMR projects in 22 years, if initiated in 2020. Once the funding for the full costs of a project are accrued, then the project delivery contract can be awarded. However, initial project planning and procurement tasks can proceed to prepare for the project award before the funds are accrued. Most SCMMR projects are modeled on a DBB project delivery method with the exception of B101 Tower Renovation, which follows a Design-Build project delivery method. In the chart below, the project schedules are depicted and spending is shown along the X-axis. The escalation rate is 0% through FY2025 and 3% thereafter. The total cost for the priority projects is $105,914,009.



GRAPHIC LEGEND

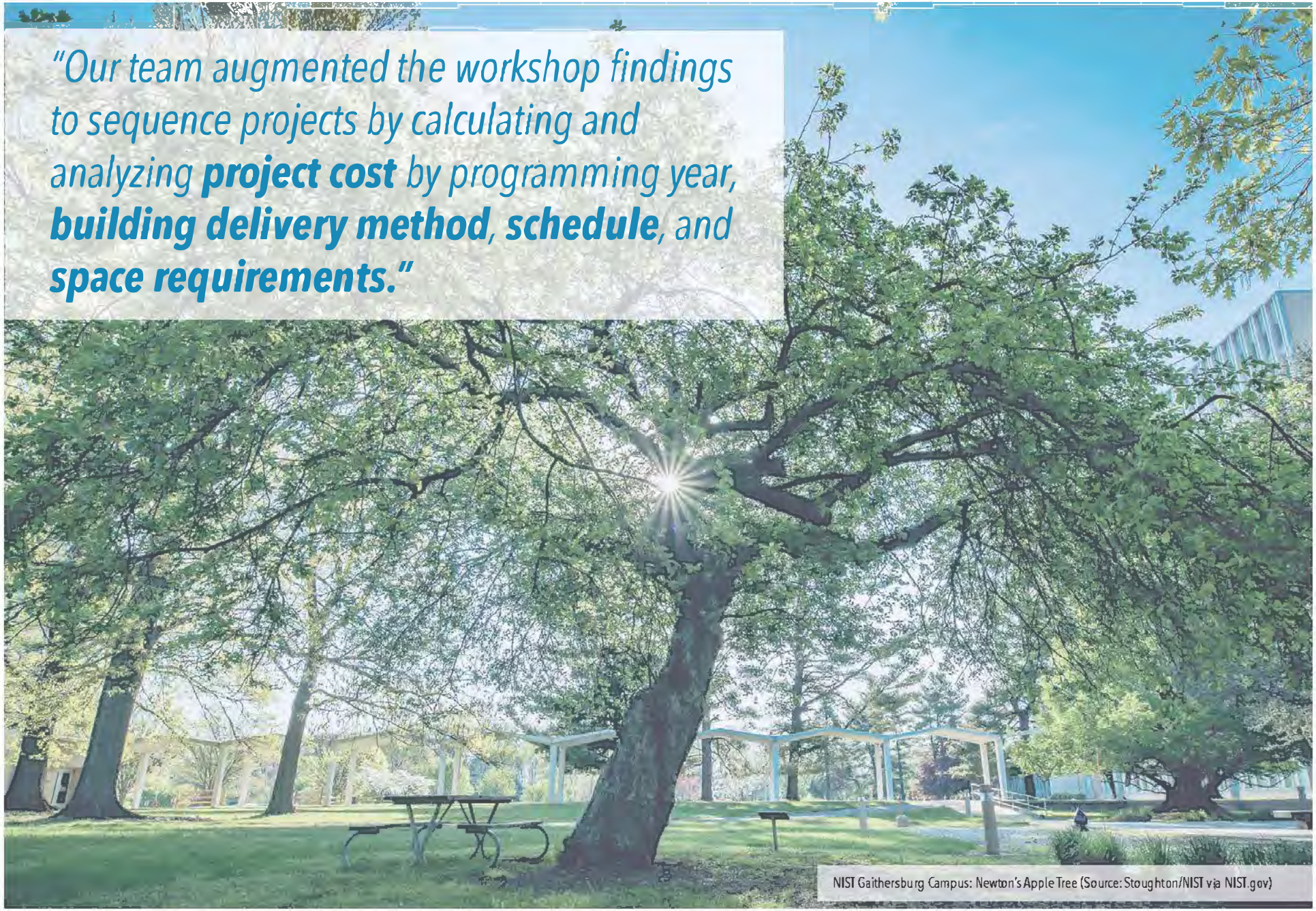
- Program of Requirements Phase
- Procurement Phase
- Design-Build Phase
- Furniture, Fixtures, and Equipment + Moves Phase

*Funding to occur every April 15

*Projects scheduled so that all funds are available prior to award of contract

PRIORITY PROJECTS

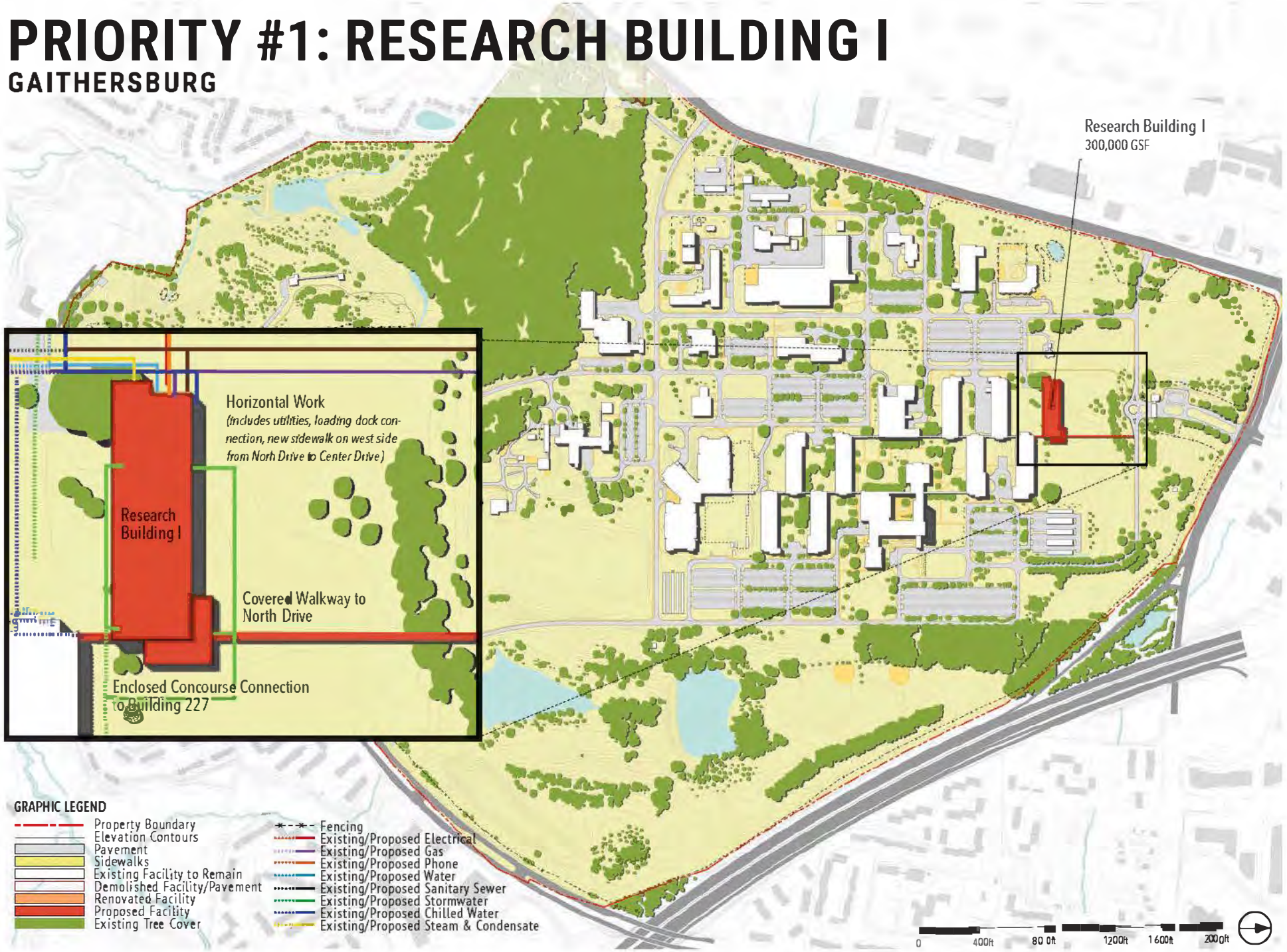
"Our team augmented the workshop findings to sequence projects by calculating and analyzing ***project cost*** *by programming year,* ***building delivery method***, ***schedule***, *and* ***space requirements."***



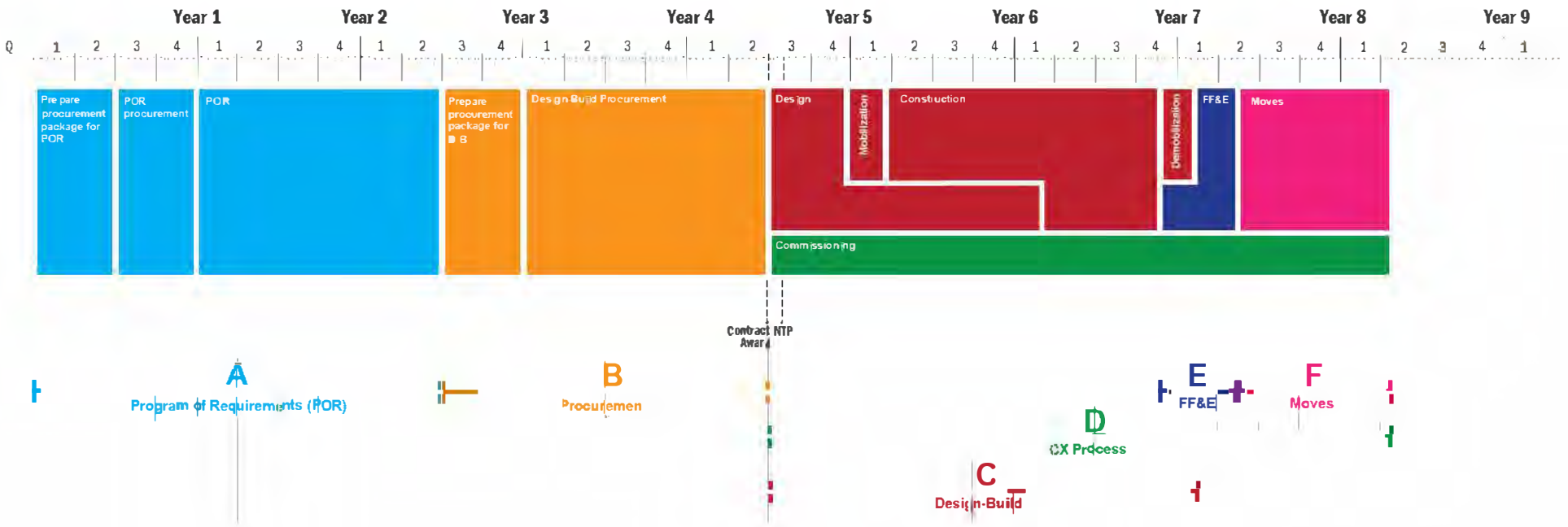
NIST Gaithersburg Campus: Newton's Apple Tree (Source: Stoughton/NIST via NIST.gov)

PRIORITY #1: RESEARCH BUILDING I

GAITHERSBURG



RESEARCH BUILDING I: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Research Building I is planned to be a 300,000 GSF advanced physical science research facility that pairs the historic pattern language of the existing GPLs with modern laboratory technology. This building will provide the infrastructure and controlled environments needed for NIST's advanced measurement science programs and provide the laboratory space required to vacate an existing GPL and begin the modernization of the aging GPL buildings.

With connections to the existing internal pedestrian circulation concourse, the facility will be located to the north of Building 226 with an orientation and massing that will respect the center core of the historic Gaithersburg Campus. It is planned to be three stories, plus a basement level for laboratories requiring the most stringent environmental controls, and a mechanical penthouse level. Based on its location near the main Campus gate, the building will serve as a visual gateway to the Campus and will include an employee entrance with shared collaboration facilities and a covered pedestrian connection to the main gate. The project also includes low impact stormwater features as well as construction of a stormwater management facility to accommodate run-off from all the proposed new buildings and additions.

The comprehensive project is estimated to take eight and a quarter years. Within this schedule, key phases have been identified with a letter. Developing a Program of Requirements (POR) (A) is estimated to take two and a half years leading to the commencement of a Design-Build (DB) procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just over two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of Furniture, Fixtures, and Equipment (FF&E) and then the move-in of staff and scientific equipment (F).

The total project cost for Research Building I with a FY2020 contract award (FY2021 construction midpoint) is estimated to be [redacted]. If escalated to 2025 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted]. If escalated to 2024 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

RESEARCH BUILDING I: COST SUMMARY

The cost estimate is calibrated to benchmarked costs for new construction of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction with specialized laboratory building requirements. The project includes a covered walkway to North Drive near Gate A. The horizontal work includes new sidewalk on the west side from North Drive to Center Drive. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2024 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

FY2025 ($60M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

Intentionally Left Blank

PRIORITY #2: BUILDING 3 ADDITION

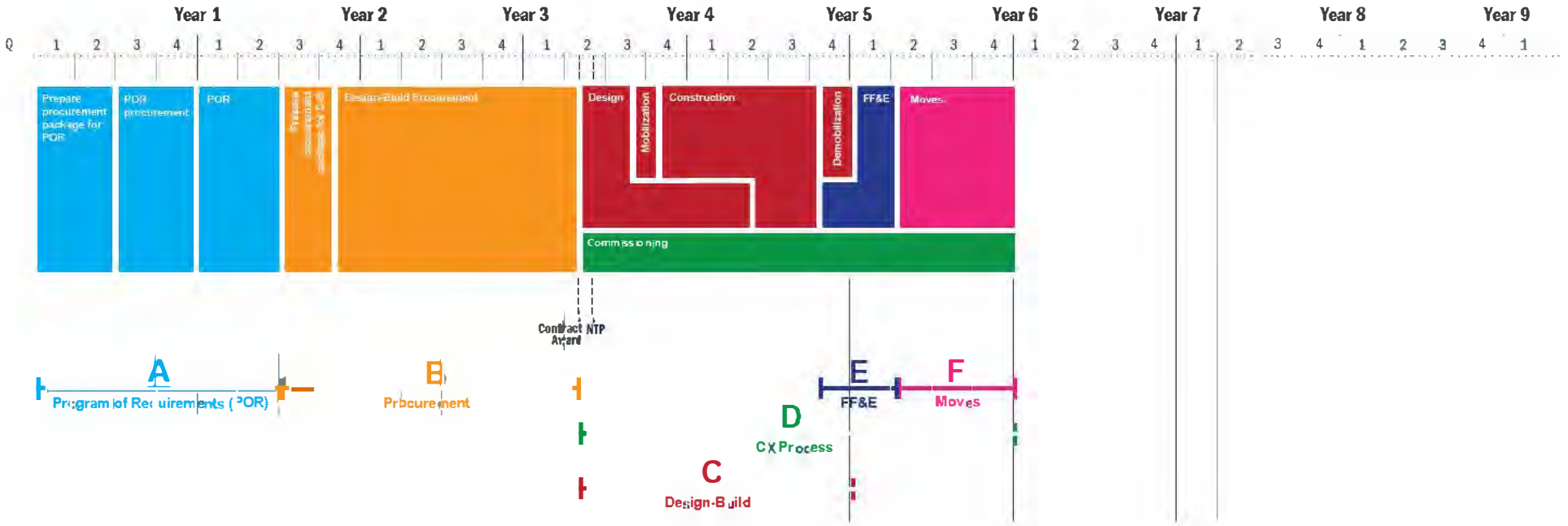
BOULDER

GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

BUILDING 3 ADDITION: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

The Building 3 Addition is a 17,500 GSF expansion on the east side of Building 3 (B3). Originally the Liquefier Building, Building 3 was expanded and renovated for the NIST Communications Technology Laboratory (CTL) in 2017. The new addition will consolidate much of CTL's space requirements and is needed before renovations to the Building 1 Spine (west) or Building 24 can proceed.

The Building 3 Addition is planned to be primarily high-bay research space, with supporting labs and offices, in support of 5G research which will allow those programs in the Building 1 Spine and Building 24 to relocate. The project includes modifications to B3 as needed to tie into the structure and utility systems, and will relocate a stormwater management structure.

The comprehensive project is estimated to take six years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just over one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and scientific equipment (F).

The Building 3 Addition is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2026 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted] If escalated to 2024 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

BUILDING 3 ADDITION: COST SUMMARY

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction with specialized laboratory building requirements and connects into the utility systems of Building 3. The project includes modifications to Building 3 to adapt the structure and building envelope.

The horizontal work includes relocating the stormwater management system and constructing walkways. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2024 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

FY2026 ($60M Annual Appropriation Schedule)

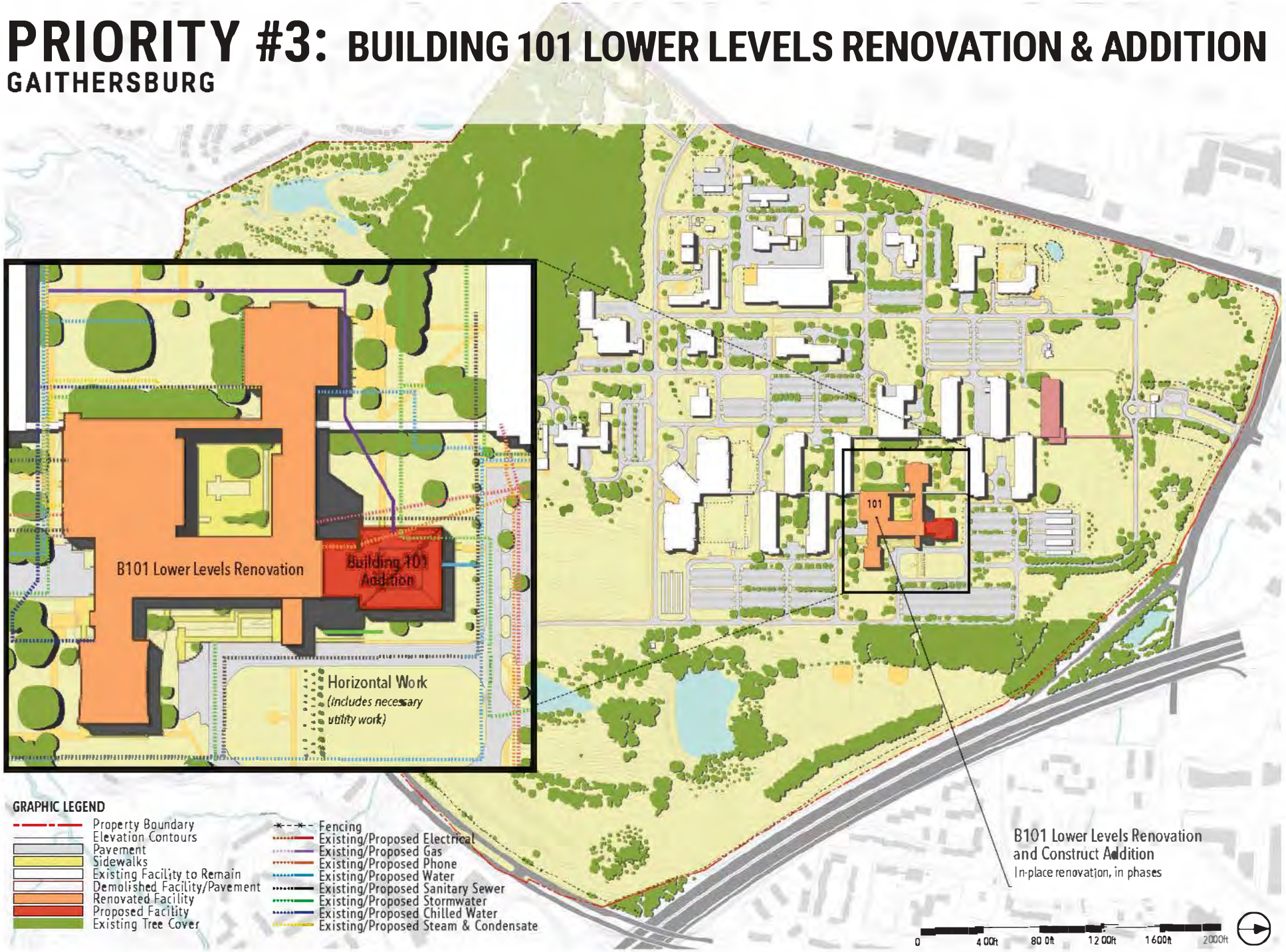
Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

Intentionally Left Blank

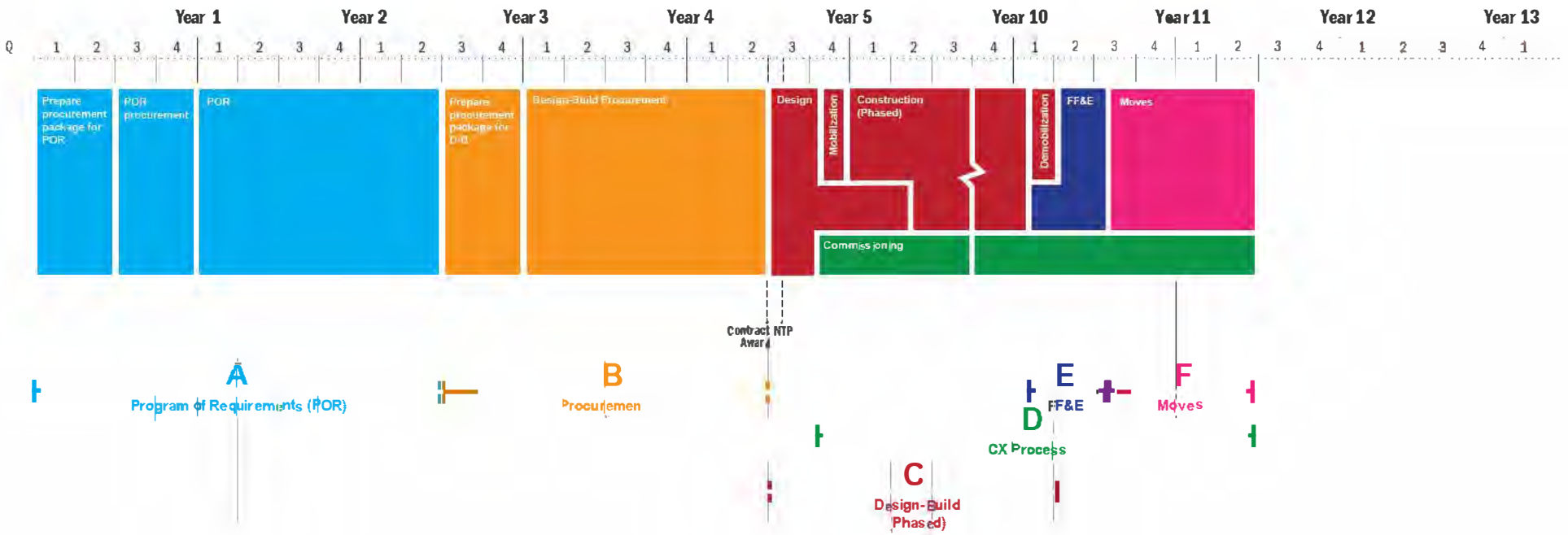
PRIORITY #3: BUILDING 101 LOWER LEVELS RENOVATION & ADDITION
GAITHERSBURG



GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Existing Tree Cover
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Gas
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing/Proposed Chilled Water
- Existing/Proposed Steam & Condensate

B101 LOWER LEVELS RENOVATION & ADDITION: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

The Administration Building 101 Complex serves as the iconic image of the NIST Gaithersburg Campus and is the predominant building in size, function and location. It includes an 11-story office tower that rises above two sprawling levels, a basement and first floor, that house NIST's central public and staff support spaces – The Lower Levels. Linked to the central core research buildings through a system of enclosed pedestrian concourses, the Lower Levels of Building 101 were designed to serve as the literal and figurative heart of the Campus. Commissioned in 1965, Building 101 is one of the earliest buildings on Campus and is a key contributing resource to the NIST Gaithersburg Campus Historic District. It's significant character defining features have been identified inside and out in a comprehensive building materials condition survey and historic structures report completed in March 2020.

The NIST Conference Center occupies much of the area on the first floor and plays a significant role in fulfilling the NIST mission by facilitating scientific outreach, collaboration, and technology transfer. The number and sizes of conferences hosted in the Conference Center have been on a continuous growth trajectory for the past 10 years and that trend is expected to continue. Additional meeting rooms of varying sizes, as well as modern technological capabilities, are needed to support the full demand of public and internal NIST conferences and meetings. A critical driver for this project is also the need for a functional realignment of some spaces in order to limit public access to only the first floor and a portion of the basement, and to create a more robust security barrier between the public areas and the adjoining spaces and buildings. Through facility condition assessments, the condition of Building 101 has been documented to be among the worst on the Gaithersburg Campus with an FCI rating of 62.51 or "Poor".

After relocating a wing of administrative offices from the first floor, this project includes renovations to create conference rooms, public spaces, restrooms and a gift shop, and the renovation of the library for a 21st century library space with updated displays, reading areas, collaboration and conference spaces. Work in the basement will include creating security barriers to limit public access, and renovations to various program areas. A 50,000 GSF addition will be constructed to the north of the main lobby that will provide critically needed larger conference spaces, an upper floor of offices to facilitate renovations in the tower, and a basement to house library stacks and other program needs. The project is expected to be accomplished through several phases and could potentially take over eleven years to complete.

The Building 101 Lower Levels Renovation and Addition is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2028 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted]. If escalated to 2026, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

B101 LOWER LEVELS RENOVATION & ADDITION: COST SUMMARY

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes that the 50,000 GSF addition would be new construction while the remaining 72,220 GSF will be renovation. The area to be renovated includes various program spaces in the Basement, portions of the First Floor A, B, and D wings, and the entire Library. The library is estimated to be a level 3 renovation while the other renovated spaces are estimated at a level 2 renovation. A description of the levels of renovation can be found in Appendix: Detailed Cost Estimates. The horizontal work includes modifications to Building 101 to adapt the structure and building envelop for the addition. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2026 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

FY2028 ($60M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

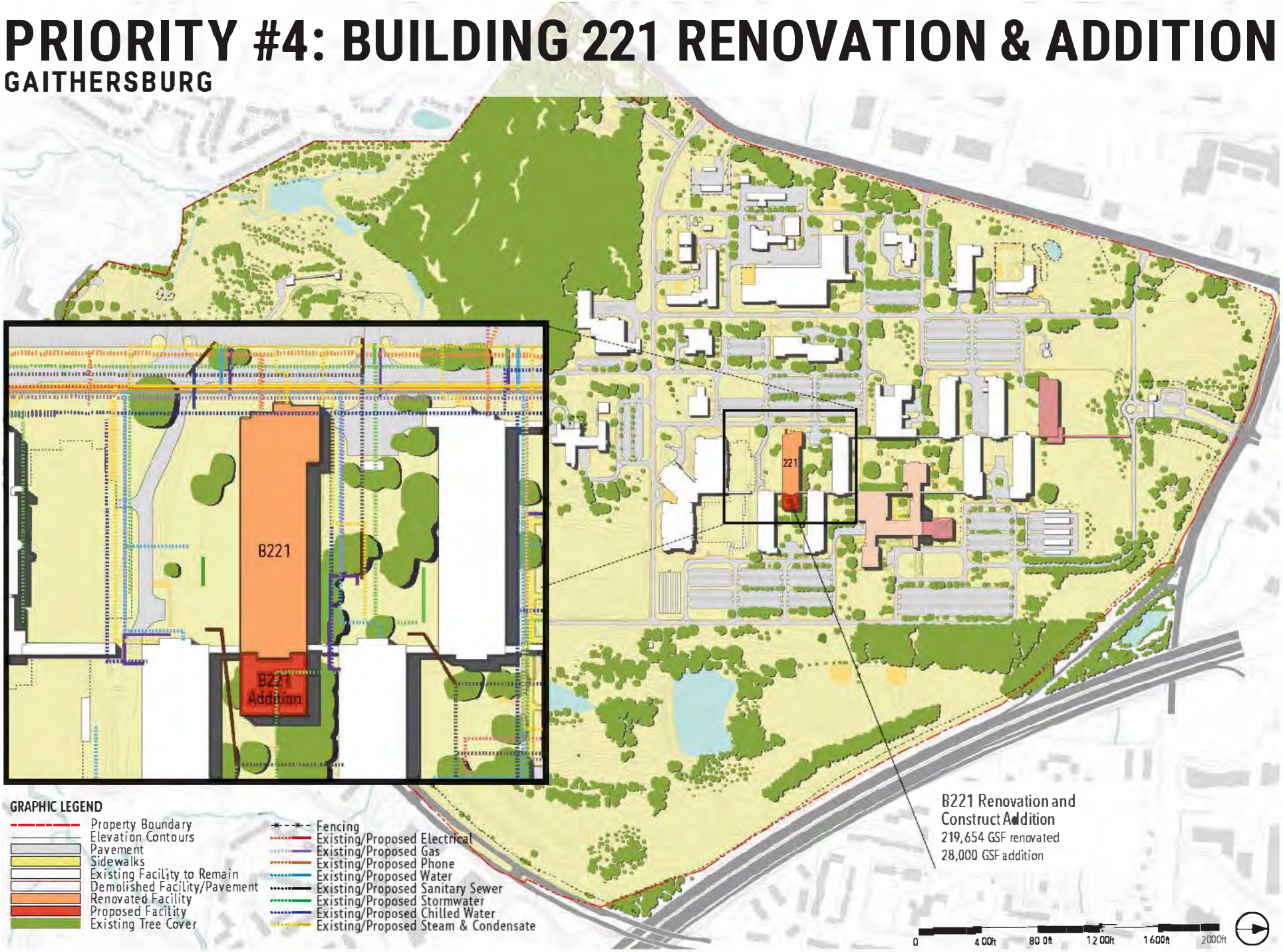
Total Project Costs

FF&E does not include specialty scientific equipment.

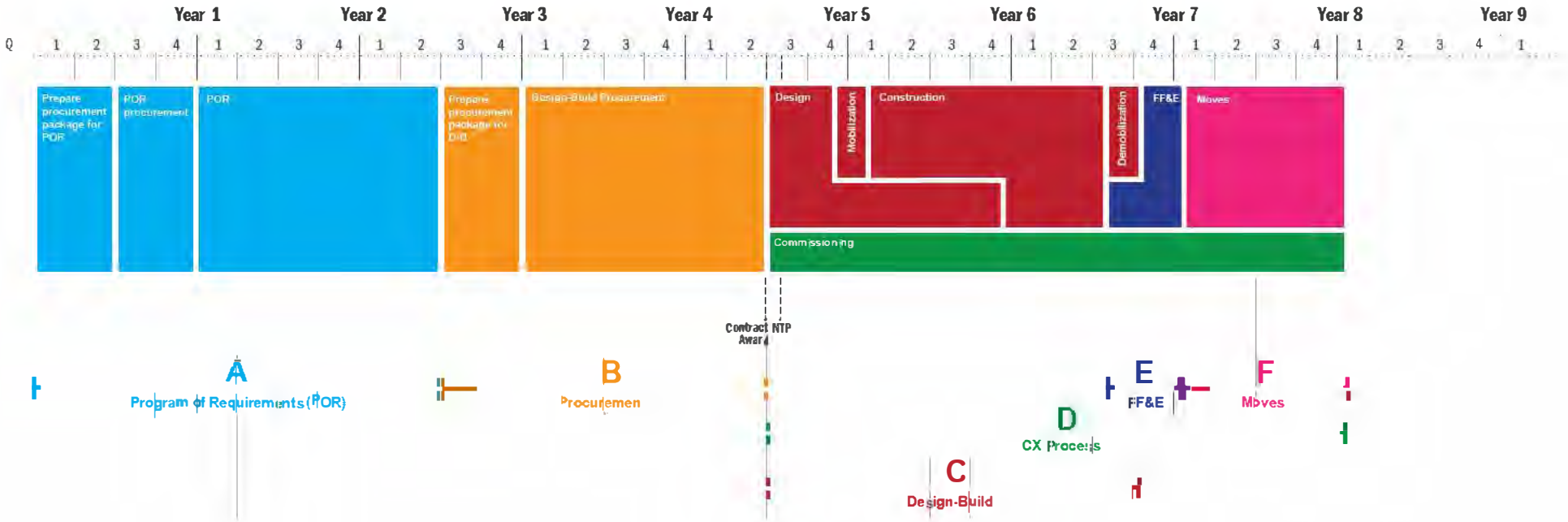
Intentionally Left Blank

PRIORITY #4: BUILDING 221 RENOVATION & ADDITION

GAITHERSBURG



BUILDING 221 RENOVATION & CONSTRUCT ADDITION: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Building 221 is one of the seven original GPLs, and will be the first to be renovated in the GPL Modernization Program. This project consists of renovating the 219,654 GSF facility and constructing a new 28,000 GSF addition to become an advanced physical science research facility that pairs the historic pattern language of the existing GPLs with contemporary laboratory technology.

Building 221 was built in 1966 and has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. This brick curtain wall building is three levels of laboratories and offices above ground with an expanded basement containing specialized laboratory equipment and is generally unchanged from the original construction, including the major systems and the uninsulated windows. It is connected to the other historic GPLs and B101 through the concourse circulation corridor.

The renovation will be extensive - tearing back the building to the structure while maintaining key historic character-defining features. Precision laboratories will be constructed in the basement in order to take advantage of the structural stability of the below ground level.

Building 221 is planned to be the first GPL to be renovated as it is the largest of the seven GPLs and, with the addition, will result in more usable area that will provide NIST extra flexibility in facilitating space transfers for continuing the GPL Modernization Program.

The comprehensive project is estimated to take eight years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just over two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and scientific equipment (F).

The Building 221 Renovation and Addition project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. If escalated to 2033 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted]. If escalated to 2030 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

BUILDING 221 RENOVATION & CONSTRUCT ADDITION: COST SUMMARY

This cost estimate is for 28,000 GSF of new construction (12%) and 219,654 GSF of renovation (88%). The renovation estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. For the area of the building under renovation, the estimate assumes a level 3 renovation. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The project includes modifications to the existing GPL to adapt the structure and building envelope to the new addition. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 15 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2030 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

FY2033 ($60M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

Intentionally Left Blank

PRIORITY #5: RESEARCH BUILDING A

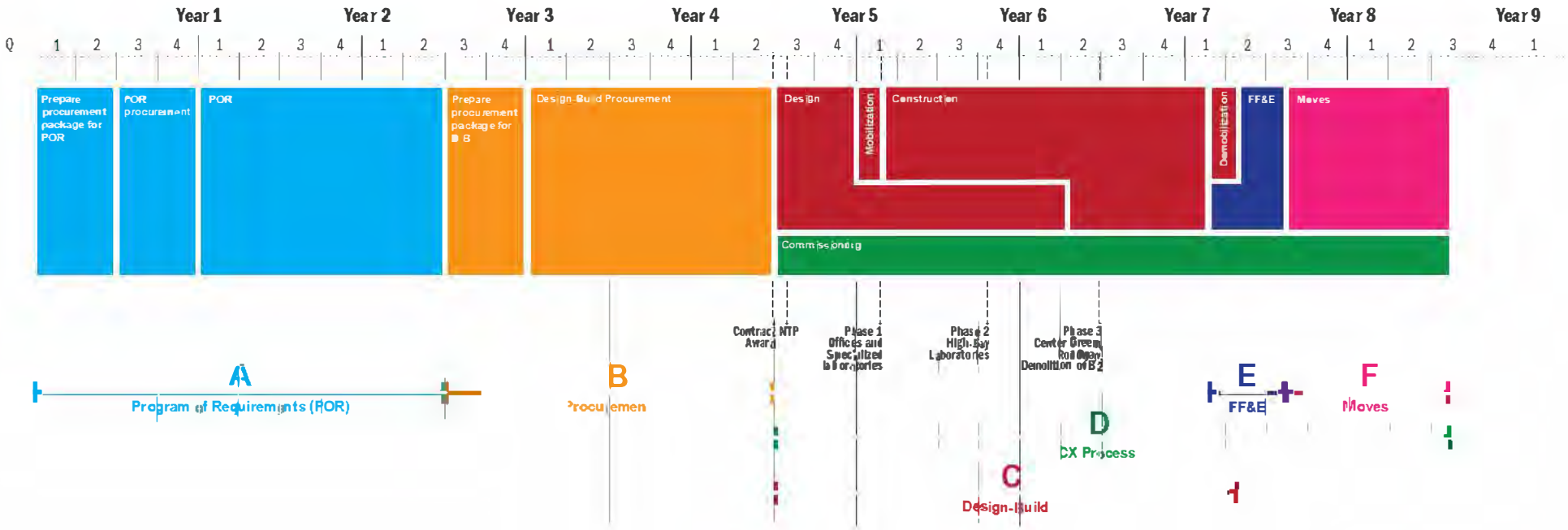
BOULDER

GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

RESEARCH BUILDING A: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Research Building A will be a 90,000 GSF advanced physical science research facility at the heart of the Boulder Campus. This project includes demolishing the existing buildings on the current site - Buildings 2, 2A, and 91. It will also entail a large amount of site improvements and utility work; constructing the east quad, removing and reconfiguring roadways, constructing a pedestrian connection and entry court to Building 81, relocating electrical connection points, and planting native landscaping.

Additionally, this project will include a second phase to construct a 280-space parking garage on the north side of Building A and the required road realignments for the access road and loading dock. As the proposed new facility will be constructed on the site of the existing facilities, a carefully staged strategy of consolidation, demolition, and construction will need to take place. A phased approach to the construction of Research Building A will be needed as a key focus will be the construction of specialty high-bay space for existing research programs that will be needed before Building 2 can be fully vacated. The comprehensive project is estimated to take eight and one half years.

Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at two and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and scientific equipment (F).

The Research Building A project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. If escalated to 2036 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted]. If escalated to 2032 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

RESEARCH BUILDING A: COST SUMMARY

The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction with specialized laboratory building requirements. The project includes construction of a 280-space parking garage. The horizontal work includes construction of the East Quad and subsequent removal and reconfiguration of the roadways. It will include construction of access roadways to the parking garage and a loading dock. It includes demolition of Buildings 2 and 91. It includes the connection to Building 81 with a new entry court and related landscaping and terracing. The project will require relocation of electrical utilities. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2032 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

FY2036 ($60M Annual Appropriation Schedule)

Estimated Construction Cost

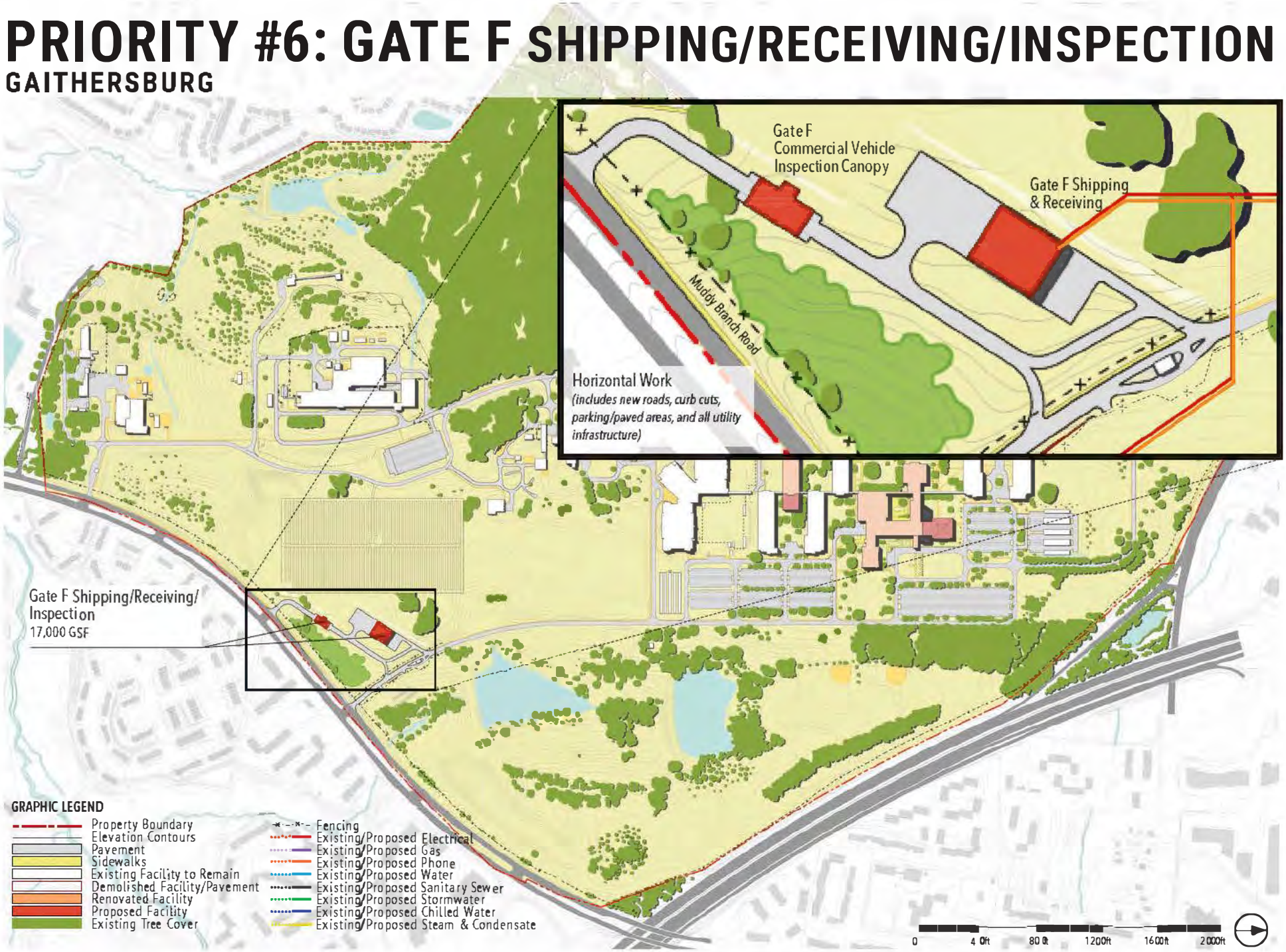
Owner's Additional Project Costs

Total Project Costs

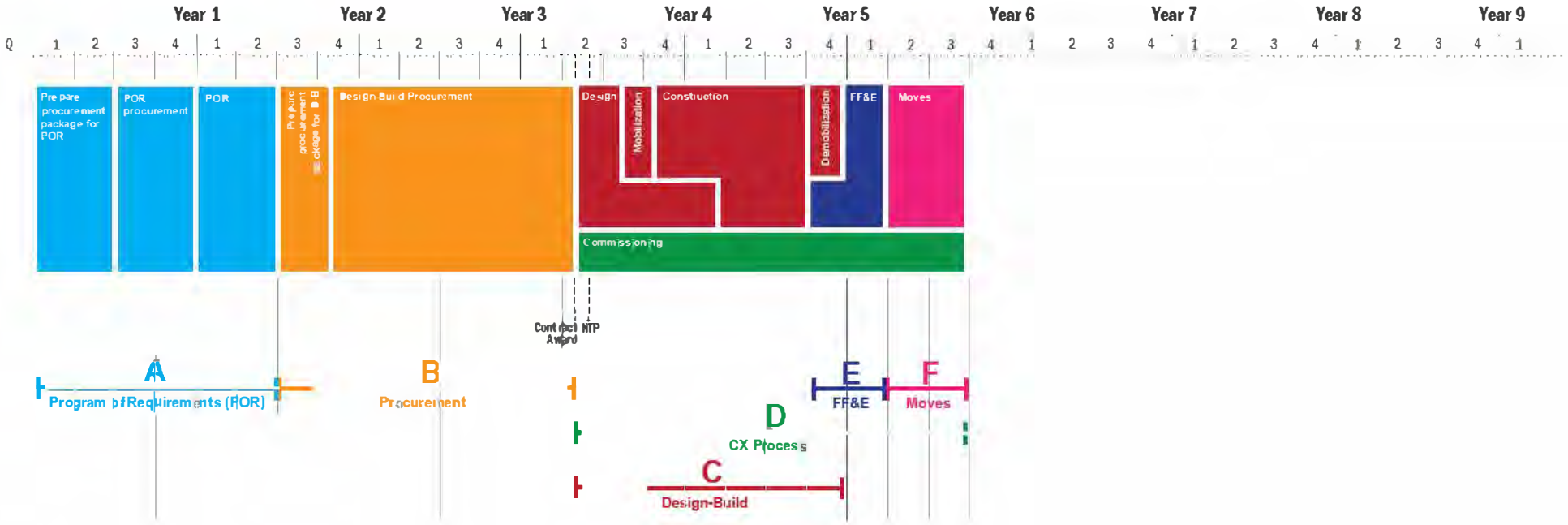
Intentionally Left Blank

PRIORITY #6: GATE F SHIPPING/RECEIVING/INSPECTION

GAITHERSBURG



GATE F SHIPPING, RECEIVING, & INSPECTION: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

The Gate F Shipping, Receiving, and Inspection (SRI) project will enable NIST to improve its security procedures by constructing two new facilities near Gate F, located in the southeastern portion of the campus in an area of open rolling fields. A new entry drive specifically for commercial vehicles will be created to the west of Gate F on Muddy Branch Road. A new Commercial Vehicle Screening facility will be a canopy structure of approximately 8,000 sf which will span across two lanes for vehicle queuing and inspection. Commercial vehicles currently enter the NIST Gaithersburg campus on the western perimeter at Gate C. The area around Gate C is congested and lacks the space for queuing or appropriate screening so it occurs further within the campus. This project provides truck security screening capability outside of the secure perimeter, and thus keeps most truck traffic outside of the perimeter entirely.

A new SRI Facility will allow deliveries to be unloaded after passing through the screening facility and will negate the need for most commercial vehicles to enter the NIST campus. The SRI Facility will be a single-story, high-bay facility, suitable for short-term storage of materials as NIST vehicles will provide final deliveries on campus. The size will be approximately 17,000 GSF and it will replace the shipping and receiving operations currently housed within Building 301 on the campus. This facility is planned to be a net-zero energy, Leadership in Energy and Environmental Design (LEED) Platinum certified building. New access roads and reject lanes will also be constructed.

The comprehensive project is estimated to take five and three-quarter years. Within this schedule, key phases have been identified with a letter. The DB phase is estimated to be one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and equipment (F).

The Gate F Shipping, Receiving, and Inspection project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. If escalated to 2036 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted]. If escalated to 2032 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

GATE F SHIPPING, RECEIVING, & INSPECTION: COST SUMMARY

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction. The project includes a new commercial vehicle inspection canopy. The horizontal work associated with the project includes new roads, curb cuts, parking/paved areas. It also includes new electrical and signal/telecom duct bank and a new water line from Muddy Branch Road. It includes an allowance for sanitary and stormwater and supporting security infrastructure. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix.

(b)(5)

Project Cost Summary (Escalated to FY2021)
Primary Facilities
Supporting Facilities
Additional Project Costs (IT/Security)
Design Contingency
Construction Contingency
Estimated Construction Cost
Predesign
Design
Permits
Construction Management Oversight & Commissioning
PCAS/LEED Certification
Furniture, Fixtures, & Equipment
Moving Costs
Owner's Additional Project Costs
Subtotal Project Cost
Owner's Institutional Support Tax
Total Project Cost

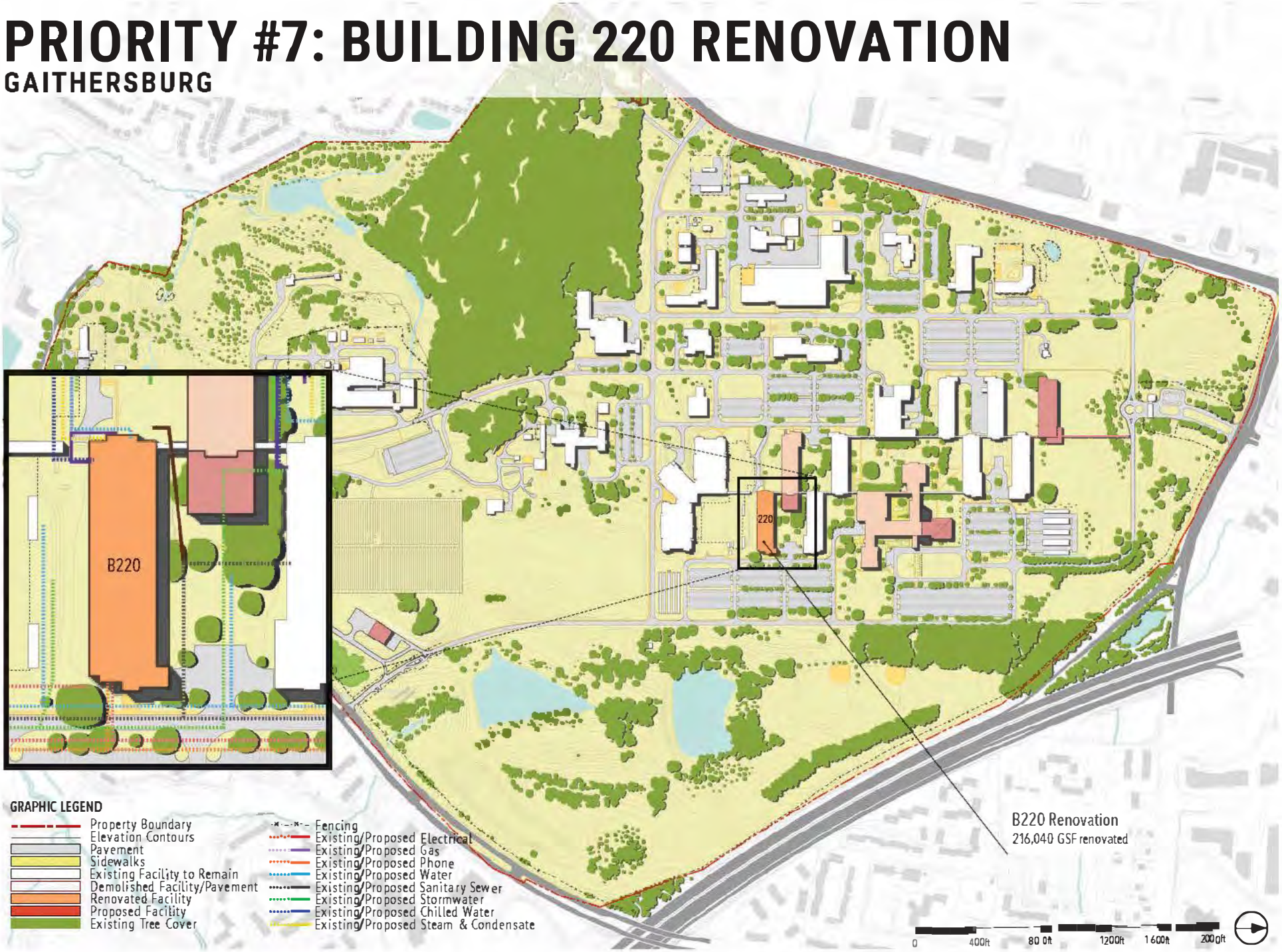
FY2032 ($80M Annual Appropriation Schedule)
Estimated Construction Cost
Owner's Additional Project Costs
Total Project Costs

FY2036 ($60M Annual Appropriation Schedule)
Estimated Construction Cost
Owner's Additional Project Costs
Total Project Costs

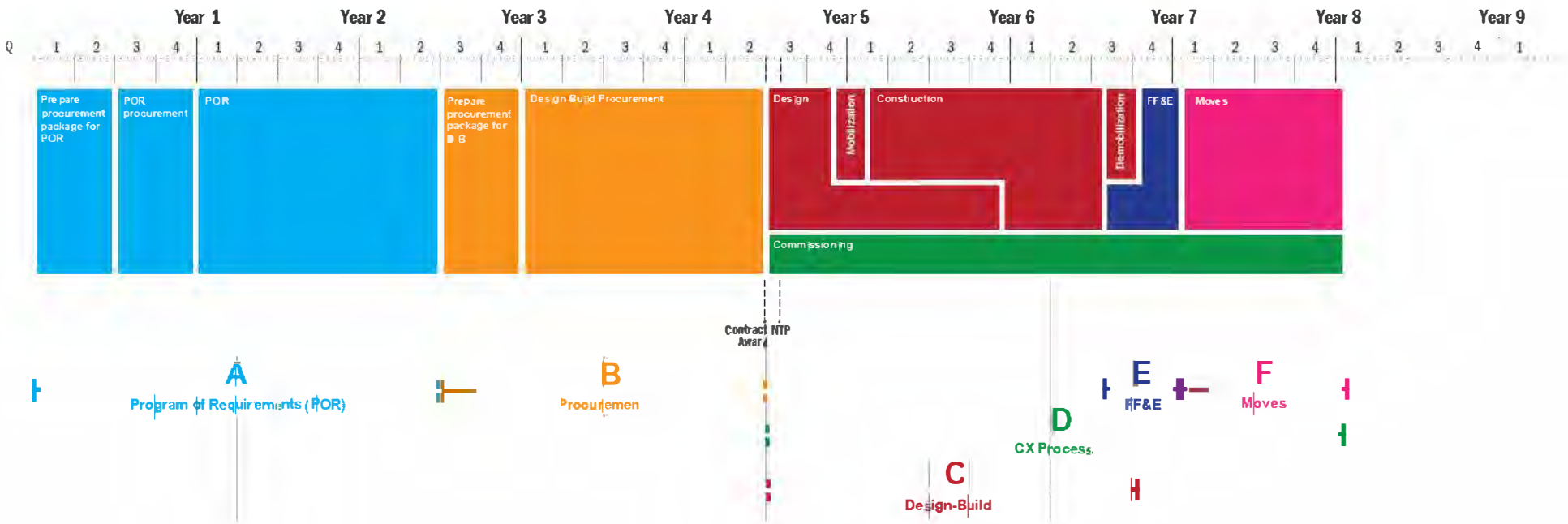
Intentionally Left Blank

PRIORITY #7: BUILDING 220 RENOVATION

GAITHERSBURG



BUILDING 220: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Building 220 is one of the seven original GPLs, and will be the second to be renovated in the GPL Modernization Program. This 216,040 GSF facility will be modernized to become an advanced physical science research facility that pairs the historic pattern language of the existing GPLs with contemporary laboratory technology.

Building 220 was built in 1966 and has been identified as a contributing resource to the NIST campus historic district. This brick curtain wall building consists of three levels above ground of laboratories and offices and a basement of specialty laboratories and is generally unchanged from the original construction, including the major systems and the uninsulated windows. It is connected to the other historic GPLs and B101 through the concourse circulation corridor. The renovation will be extensive, tearing back the building to the structure while maintaining key historic character-defining features. Precision laboratories will be constructed in the basement in order to take advantage of the structural stability of the below ground level.

The comprehensive project is estimated to take eight years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just over two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and scientific equipment (F).

The Building 220 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2040 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted] If escalated to 2035 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

BUILDING 220: COST SUMMARY

The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate assumes a level 3 renovation. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

FY2035 ($80M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

FY2040 ($60M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

Intentionally Left Blank

PRIORITY #8: CHILDCARE CENTER

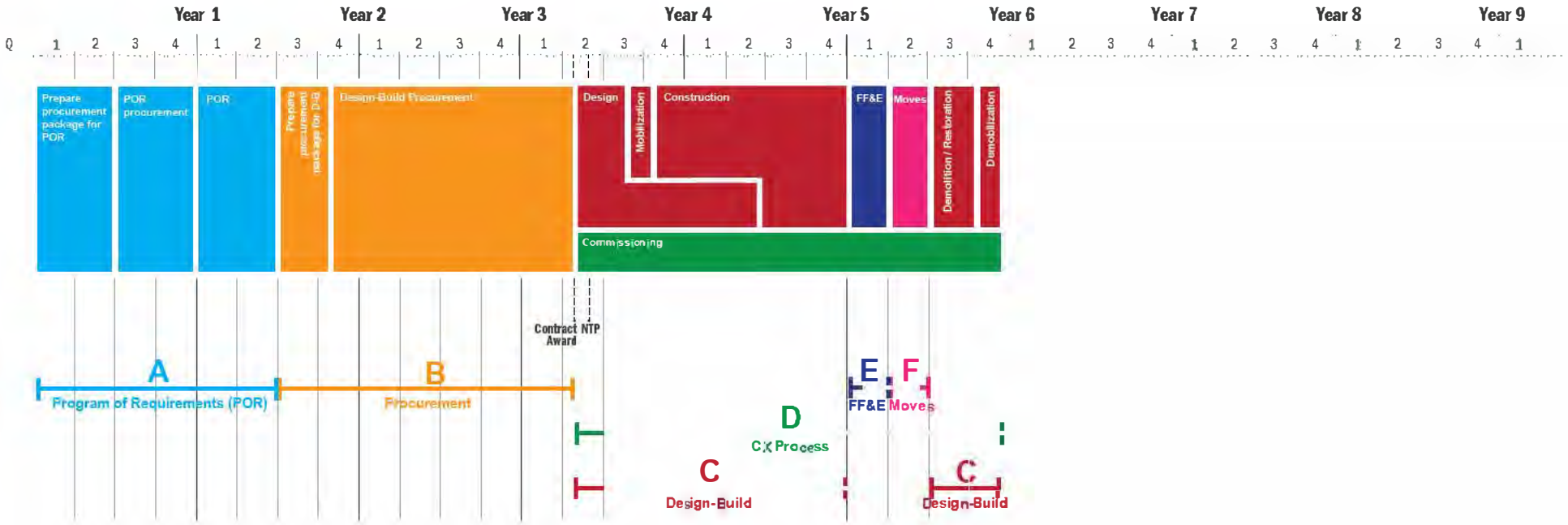
BOULDER

GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

CHILDCARE CENTER: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

The Childcare Center project will be a 13,000 GSF replacement of the existing childcare center. This project includes new curb cuts, parking and paving areas, new utility connections and outdoor play areas. The project will also cover demolition of the existing childcare facility, demolishing the surrounding paving, capping utilities, and returning the original site to a vegetated greenfield after the new facility is constructed.

The original childcare center was built in 1989 and was constructed of modular units. As a result, the thirty-year old facility is now functionally inadequate and well past its useful life. Under an agreement between the Boulder Laboratories and the Commerce Children's Center Association, NIST is to provide space and facility services.

The Master Plan recommends the childcare facility align with the underlying grid pattern of the independent buildings and locates it further to the west to remove it from the research buildings zone. A new vehicular drive and drop-off will provide more efficient and safer drop-offs and pick-ups for parents and children. The Childcare Center is planned to be a net-zero energy facility and is sized to meet the General Services Administration (GSA) Childcare Center guidelines.

The comprehensive project is estimated to take six years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just over a year and a half (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. Next is the installation of FF&E and move-in (F). Finally, this project will finish with the demolition of the existing facility and conversion of the site to a greenfield.

The Childcare Center project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2041 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted]. If escalated to 2035 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

CHILDCARE CENTER: COST SUMMARY

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction. The project includes the demolition of the existing facility, paving, capping utilities, and returning the site to a greenfield. The estimate includes horizontal work such as new roads, curb cuts, parking/ paved areas, new utility connections, and an allowance for an outdoor play area. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2035 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

FY2041 ($60M Annual Appropriation Schedule)

Estimated Construction Cost

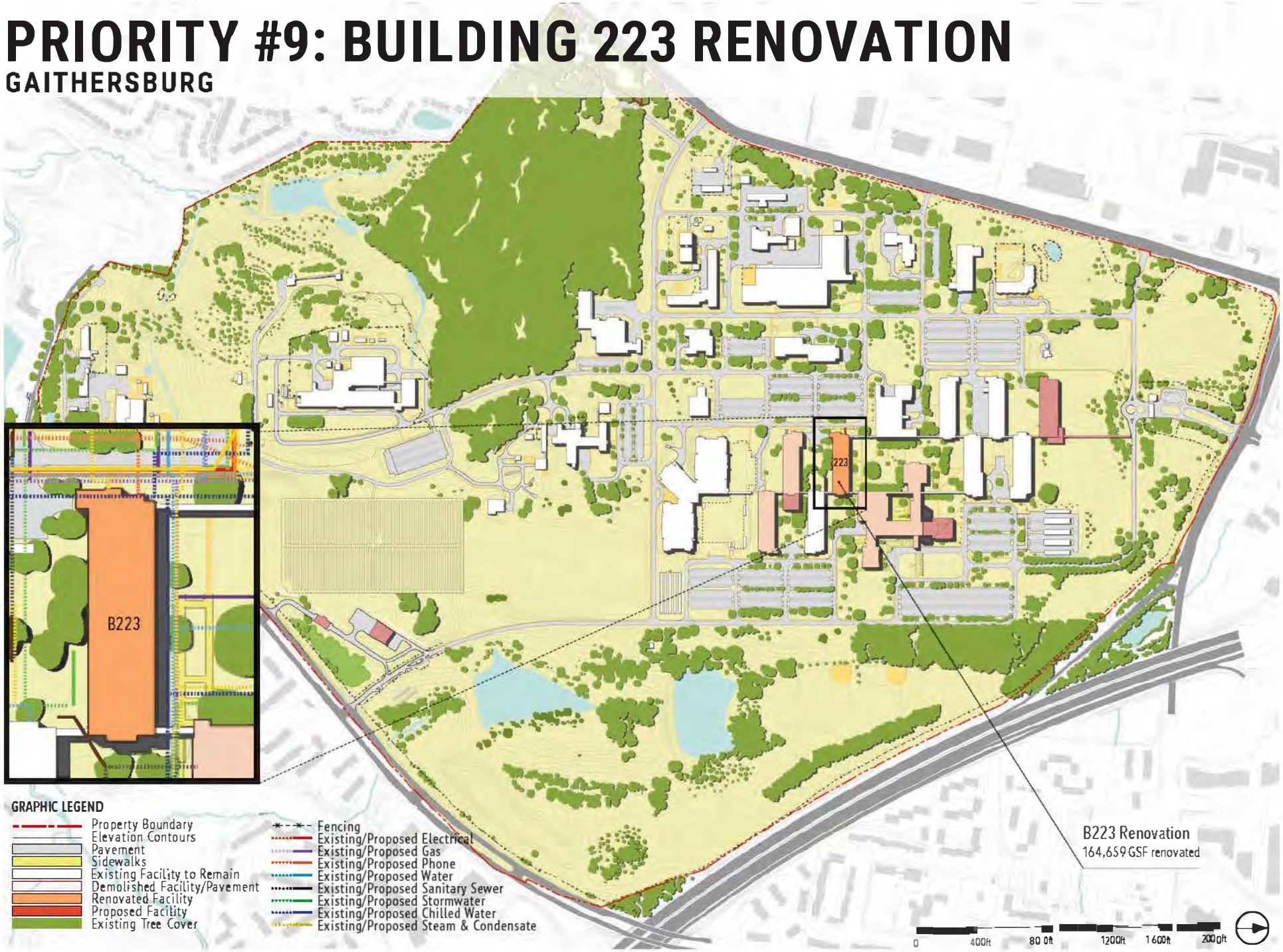
Owner's Additional Project Costs

Total Project Costs

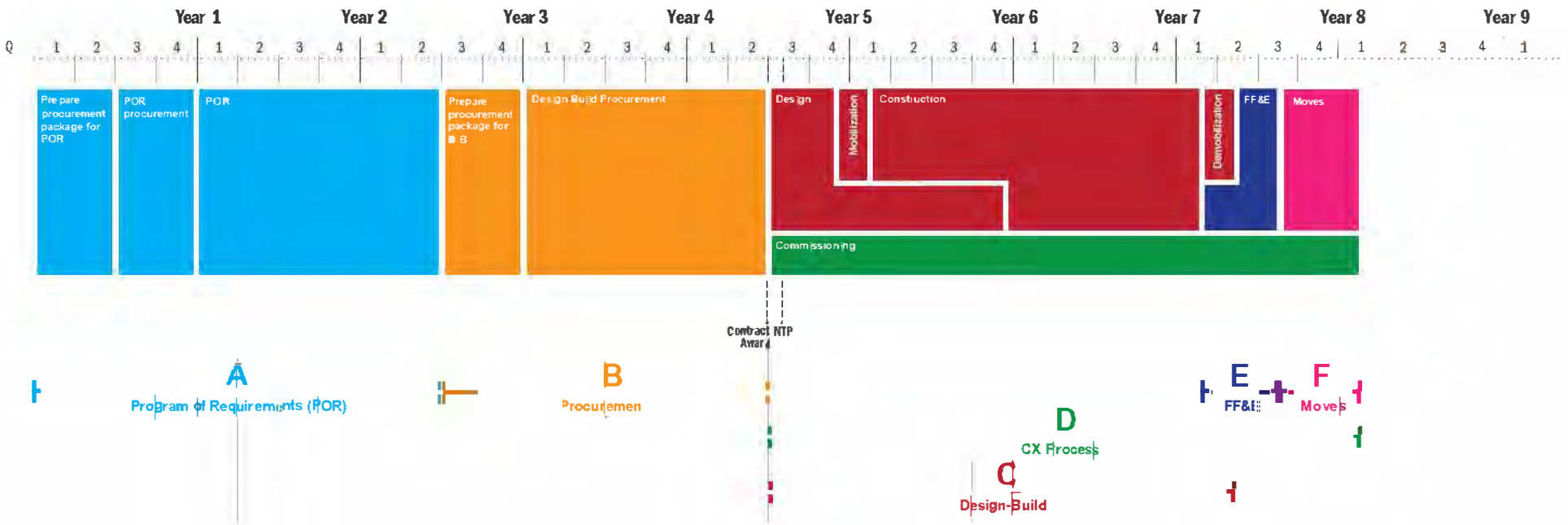
Intentionally Left Blank

PRIORITY #9: BUILDING 223 RENOVATION

GAITHERSBURG



BUILDING 223: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Building 223 is one of the seven original GPLs, and it will be the third to be renovated in the GPL Modernization Program. The renovated 164,659 GSF building is planned to house the NIST Central Computing Facility, related support spaces and offices for the Office of Information Management Services (OISM) staff, all currently located in Building 225, as well as a high-performance computing center to serve all NIST laboratories.

Building 223 was built in 1966 and has been identified as a contributing resource to the NIST campus historic district. This brick curtain wall building consists of three levels of laboratories and offices and is generally unchanged from the original construction, including the major systems and the uninsulated windows. It is connected to the other historic GPLs and B101 through the concourse circulation corridor. The renovation will be extensive, tearing back the building to the structure while maintaining key historic character defining features.

The comprehensive project is estimated to take eight years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just under three years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and equipment (F).

The Building 223 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2044 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted]. If escalated to 2038 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

BUILDING 223: COMPREHENSIVE PROJECT SCHEDULE

The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate assumes a level 3 renovation. A description of the levels of renovation can be found in Appendix: Detailed Cost Estimates. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2038 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

FY2044 ($60M Annual Appropriation Schedule)

Estimated Construction Cost

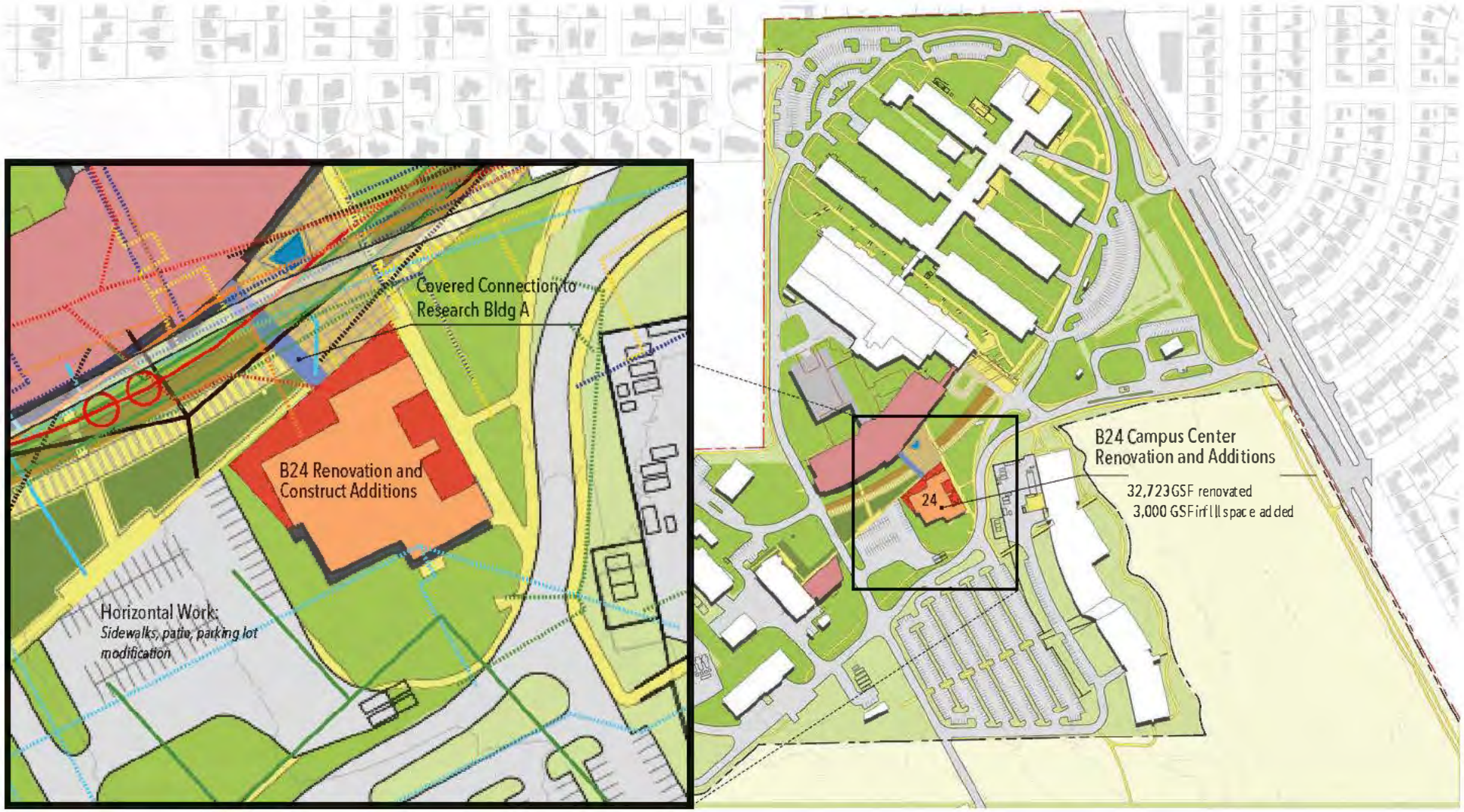
Owner's Additional Project Costs

Total Project Costs

Intentionally Left Blank

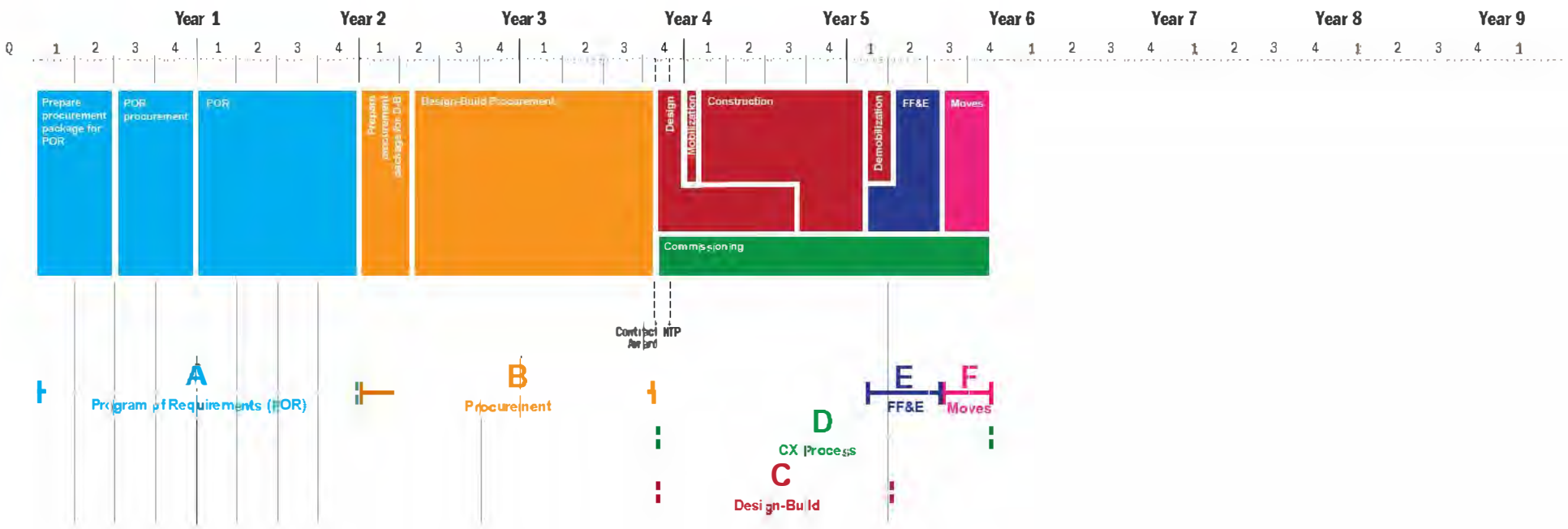
PRIORITY #10: B24 CAMPUS CENTER

BOULDER



June 2020

B24 CAMPUS CENTER: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

The Building 24 project consists of renovating 32,723 GSF and constructing 3,000 GSF of infill additions to the existing building in order to transform it into a Campus Center. The project also includes a covered connection to Research Building A, sidewalks, patios for socializing, and modification of the parking lot to the southeast of the existing building. The new Campus Center will provide a central gathering place for collaboration and services for the Boulder Campus that does not currently exist.

Building 24 was built in 1967 and consists of two above-grade floors and a basement of high-bay research space, laboratories, and offices. It is in poor condition but cannot be vacated until the Building 1 West Spine renovation and the Building 3 Addition projects are completed for relocating the existing research programs. The building was selected for the Campus Center because of its central location and existing pedestrian connectivity to other key landmarks on campus. The Center would retain the structure of Building 24, taking advantage of the high-bay area for dining and fitness activities. The Plan proposes that the building setbacks on the east be enclosed to create collaboration space that would be visible from the entrance road and the Campus green. Dual entrances on the north and south would welcome employees from both NIST and NOAA, and outdoor areas would provide recreation and connection to the Campus green and research buildings. LEED Gold certification is the goal for this facility.

The comprehensive project is estimated to take six years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just under one year and a half (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and equipment (F).

The Building 24 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. If escalated to 2045 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted]. This means that the rate of escalation becomes greater than the annual appropriation. If escalated to 2038 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

B24 CAMPUS CENTER: COST SUMMARY

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate assumes a level 3 renovation. The estimate includes horizontal work such as a covered connection to Research Building A, sidewalks, and a patio. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2038 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

(b)(5)

FY2045 ($60M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

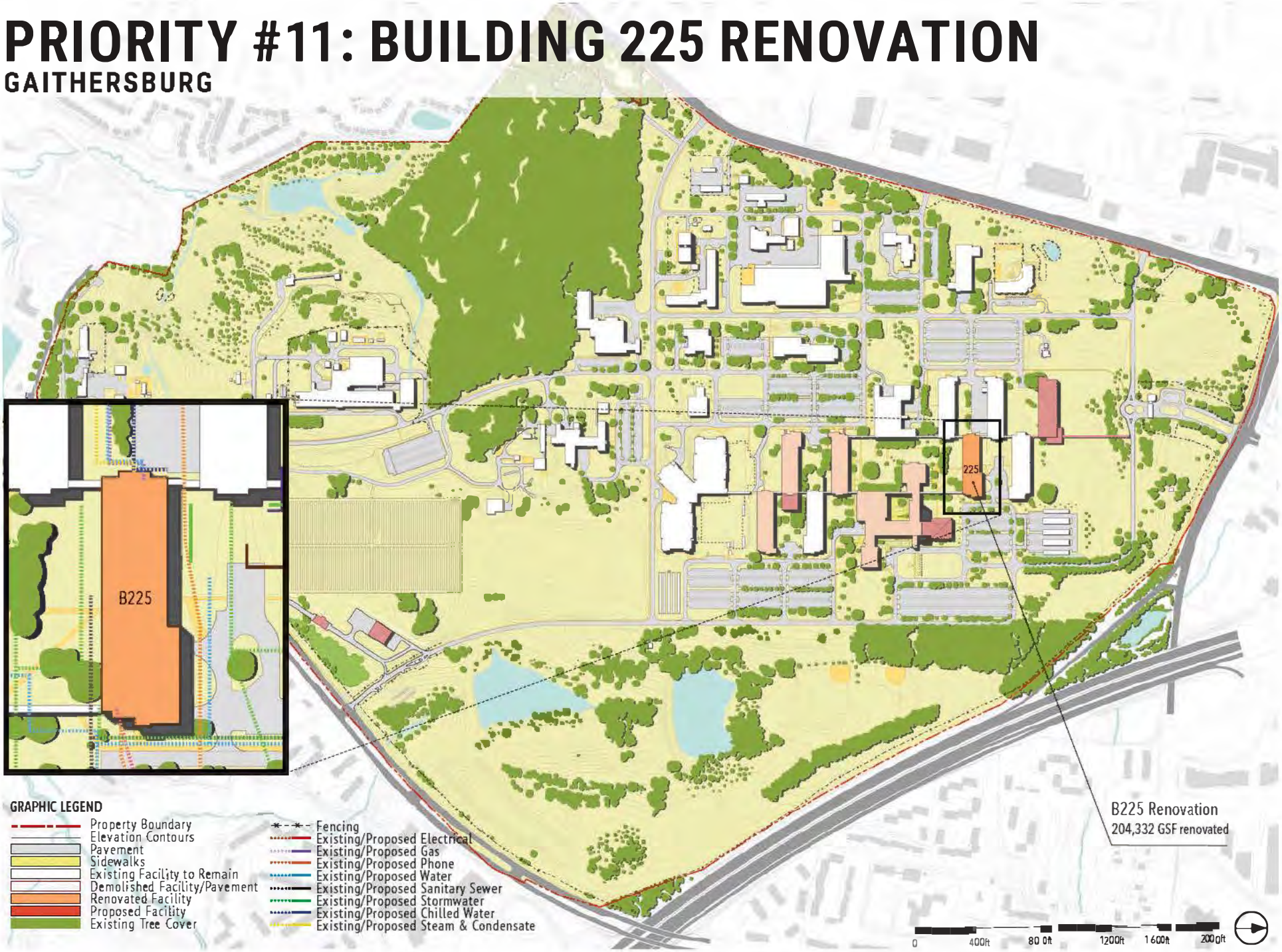
Total Project Costs

(b)(5)

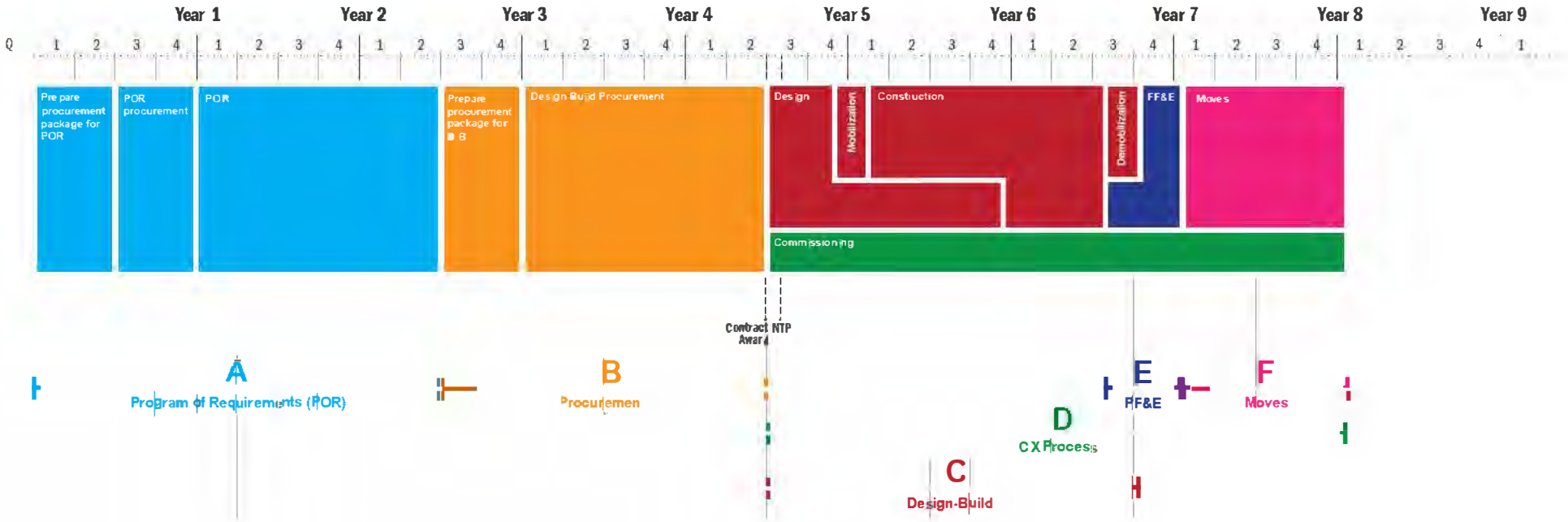
Intentionally Left Blank

PRIORITY #11: BUILDING 225 RENOVATION

GAITHERSBURG



BUILDING 225: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Building 225 is one of the seven original GPLs, and will be the fourth to be renovated in the GPL Modernization Program. This 204,332 GSF facility will be modernized to become an advanced physical science research facility that pairs the historic pattern language of the existing GPLs with contemporary laboratory technology. Since the Central Computing Facility (CCF) is currently located in Building 225, the renovation of Building 223 with a new CCF must be completed before this project can proceed.

Building 225 was built in 1966 and has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. This brick curtain wall building consists of a basement and three levels above ground of laboratories and offices and is generally unchanged from the original construction, including the major systems and the uninsulated windows. It is connected to the other historic GPLs and B101 through the concourse circulation corridor. The renovation will be extensive, tearing back the building to the structure while maintaining key historic character-defining features. Precision laboratories will be constructed in the basement in order to take advantage of the structural stability of the below ground level.

The comprehensive project is estimated to take eight years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just under three years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and scientific equipment (F).

The Building 225 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2050 as shown in the $60M/year CRF Program schedule, the estimated total project cost is [redacted] If escalated to 2042 as shown in the $80M/year CRF Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

BUILDING 225: COST SUMMARY

The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate assumes a level 3 renovation. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The estimates for the $80M and $60M appropriations are escalated at a 3% annual rate. Reference page 15 for the $80M appropriation schedule and page 16 for the $60M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

Owner's Institutional Support Tax

Total Project Cost

FY2042 ($80M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

(b)(5)

FY2050 ($60M Annual Appropriation Schedule)

Estimated Construction Cost

Owner's Additional Project Costs

Total Project Costs

(b)(5)

Intentionally Left Blank

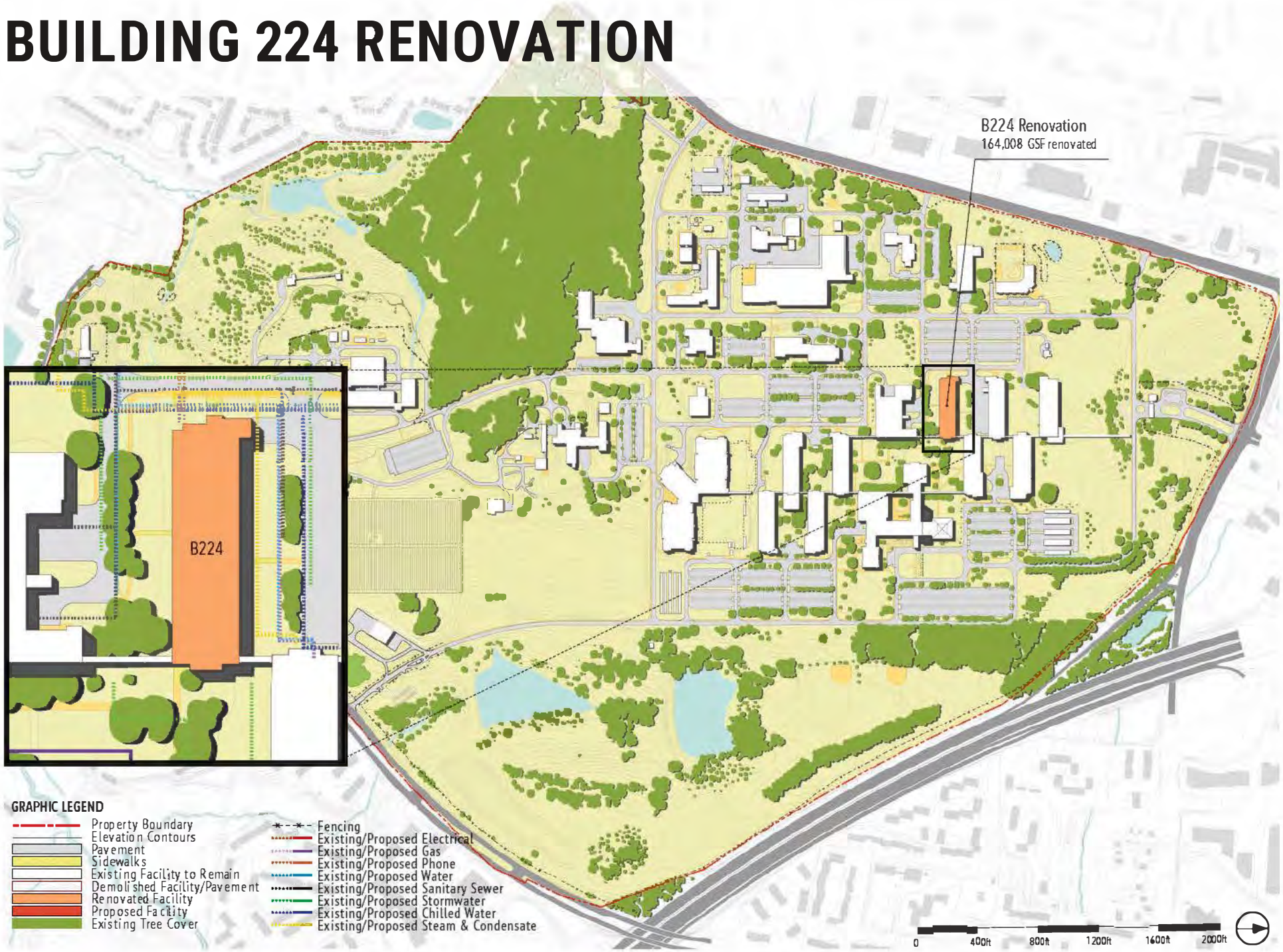
GAITHERSBURG PROJECTS

The following projects are also identified in the NIST Gaithersburg Campus Master Plan

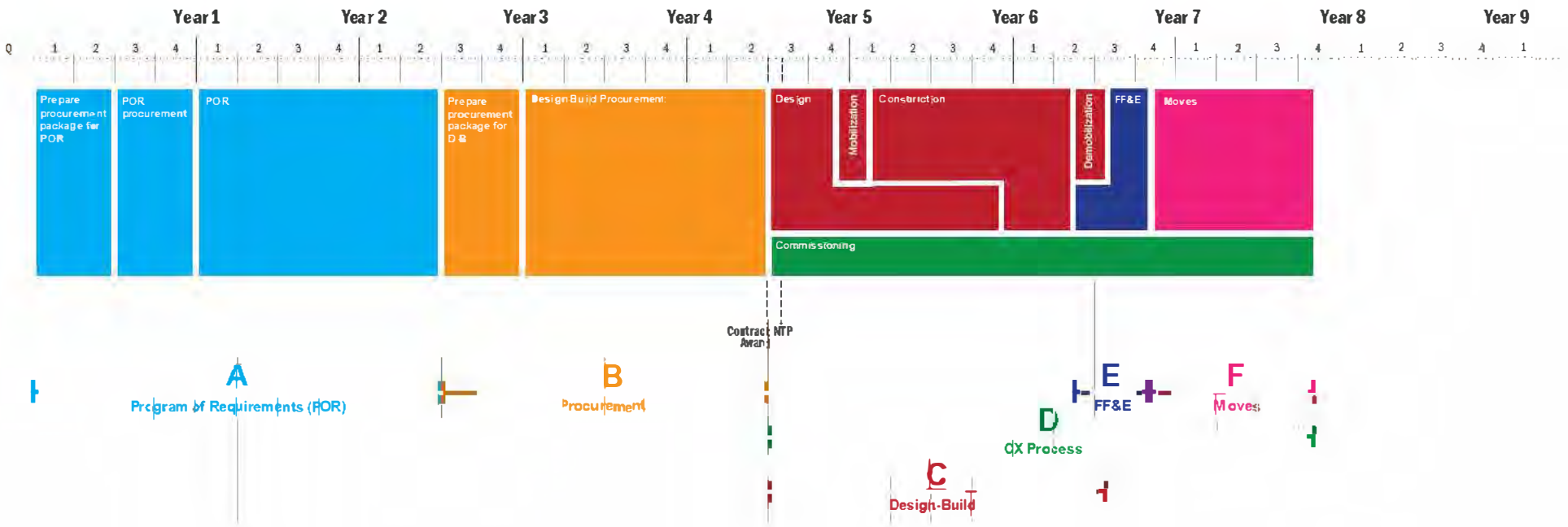
Note: Building 245 is not included in this section, as the renovation and expansion of this building is already in construction

NIST Gaithersburg Campus: Building 101 (Source: NIST)

BUILDING 224 RENOVATION



BUILDING 224 RENOVATION: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Building 224 is one of the seven original GPLs, and is targeted to be the fifth to be renovated in the GPL Modernization Program. This 164,008 GSF facility will be modernized to become an advanced computer research facility that pairs the historic pattern language of the existing GPLs with contemporary laboratory technology. The renovation will result in computer laboratories and support spaces, offices, and collaboration spaces to support information technology, IT security, and communications technology research programs.

Building 224 was built in 1966 and has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. This brick curtain wall building consists of three levels of laboratories and offices and is generally unchanged from the original construction, including the major systems and the uninsulated windows. It is connected to the other historic GPLs and Building 101 through the concourse circulation corridor. The renovation will be extensive tearing back the building to the structure while maintaining key historic character defining features.

The comprehensive project is estimated to take approximately eight years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract(B). The DB phase is estimated at just over two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

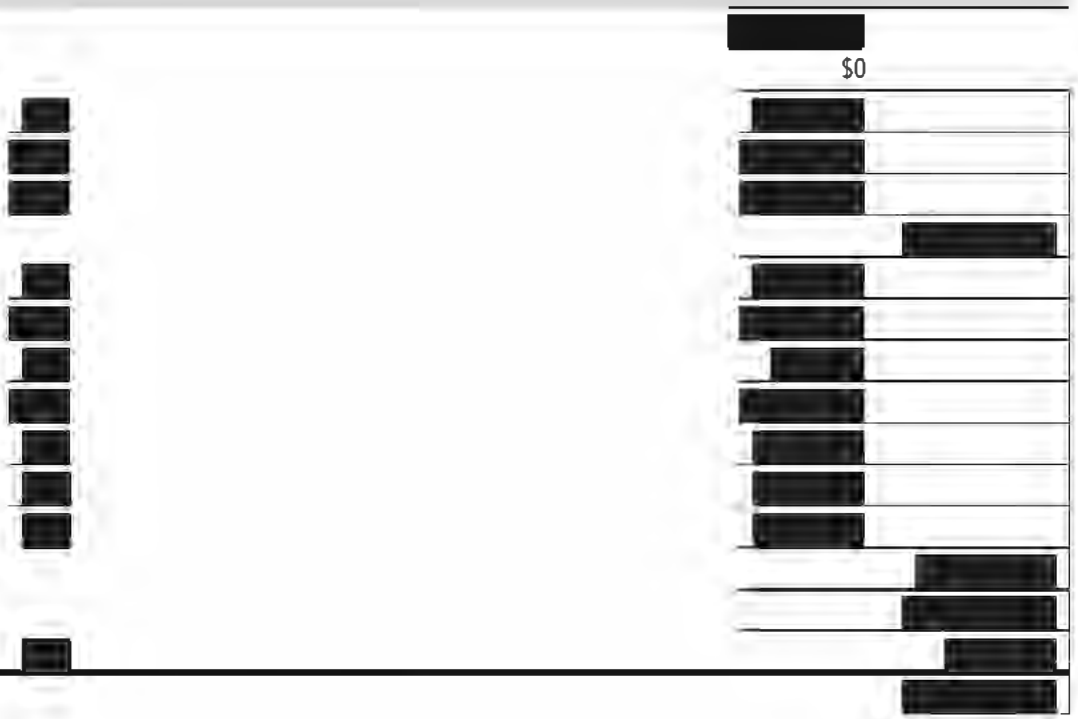
The Building 224 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

BUILDING 224: COST SUMMARY

The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. The estimate assumes the building is 100% level 3 renovation with specialized laboratory building requirements. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

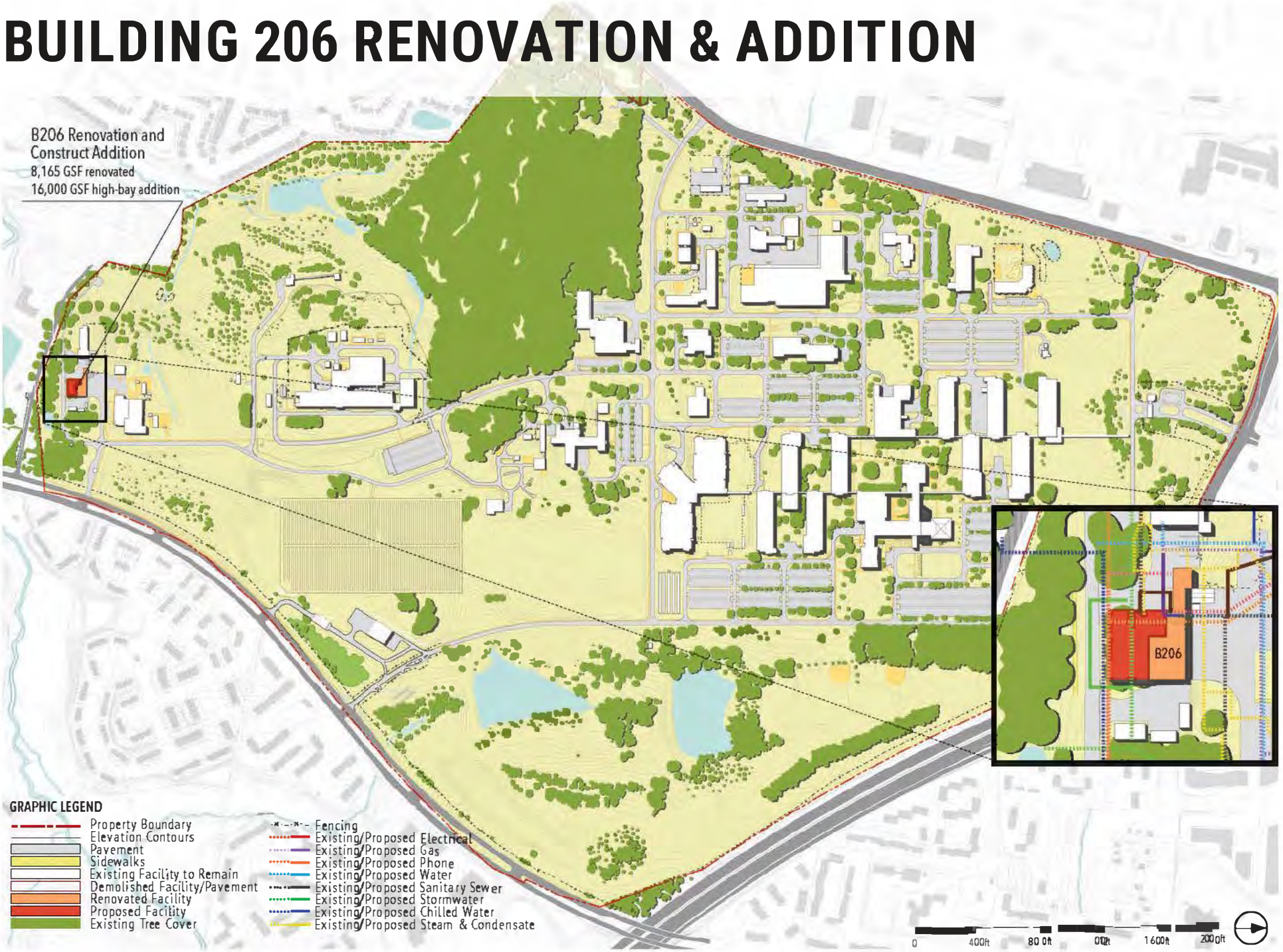
(b)(5)

Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	$0
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

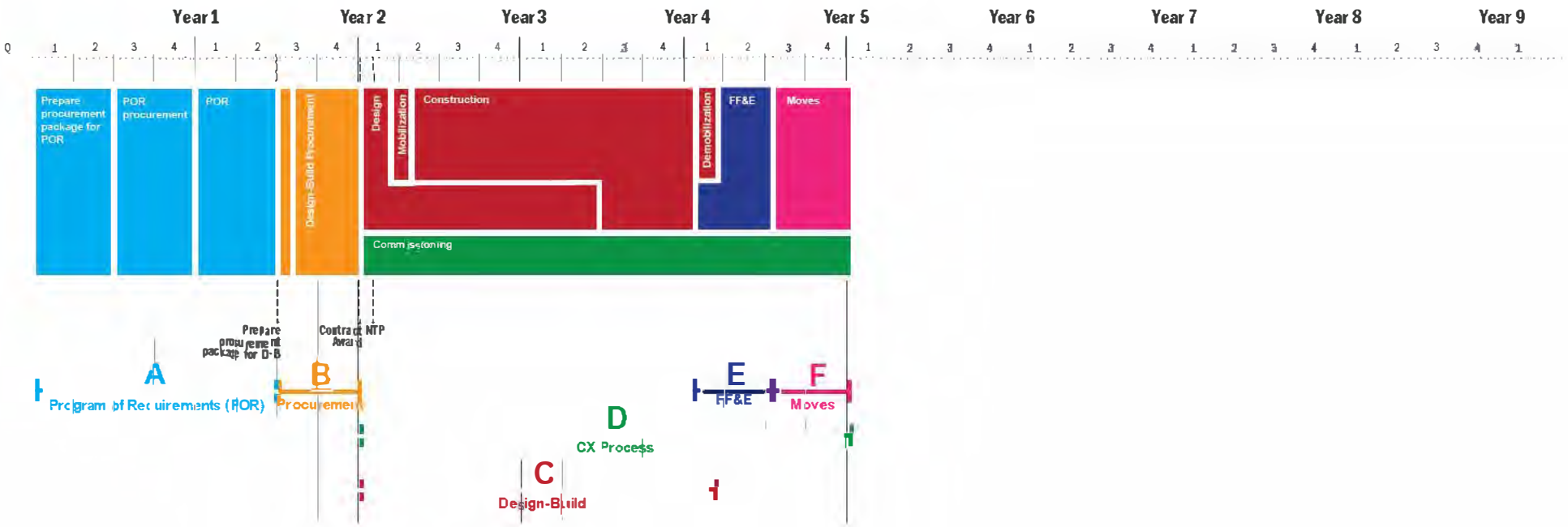


Intentionally Left Blank

BUILDING 206 RENOVATION & ADDITION



BUILDING 206: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

The Building 206 Renovation and Addition project consists of renovating the existing 8,165 GSF special purpose laboratory building and constructing a 16,000 GSF addition. The original facility was constructed in the mode of a high-bay factory/processing plant structure with two high-bay, column-free spaces designed for the preparation of samples and processing of aggregate materials. It has just basic air ventilation capabilities and does not support the sophisticated environmental control requirements of NIST's contemporary research programs.

The renovation will upgrade the existing facility to provide a modern laboratory environment and, with the 16,000 GSF addition of modern high-bay research space, Building 206 will serve as the swing space needed to vacate the large high-bay areas in Building 226 so that it can be renovated. After Building 226 is renovated and re-occupied, Building 206 will provide much needed expansion of high-bay research space on the Gaithersburg Campus.

Constructed in 1968, Building 206 has been identified as a contributing resource to the NIST Gaithersburg Campus historic district and the single-story high-bay structure is generally unchanged from the original construction. The renovation will be extensive tearing back the building to the structure and replacing all major building systems while maintaining key historic character-defining features. The design and construction of the addition will follow the Secretary of the Interior's Standards for the Treatment of Historic Structures.

The comprehensive project is estimated to take approximately five years. Within this schedule, key phases have been identified with a letter.

Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated to be just over two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Building 206 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

BUILDING 206: COST SUMMARY

This cost estimate is for 16,000 GSF of new construction (66%) and 8,165 GSF of renovation (34%). The renovation portion is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. For the area of the building under renovation, the estimate assumes a level 3 renovation. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates.

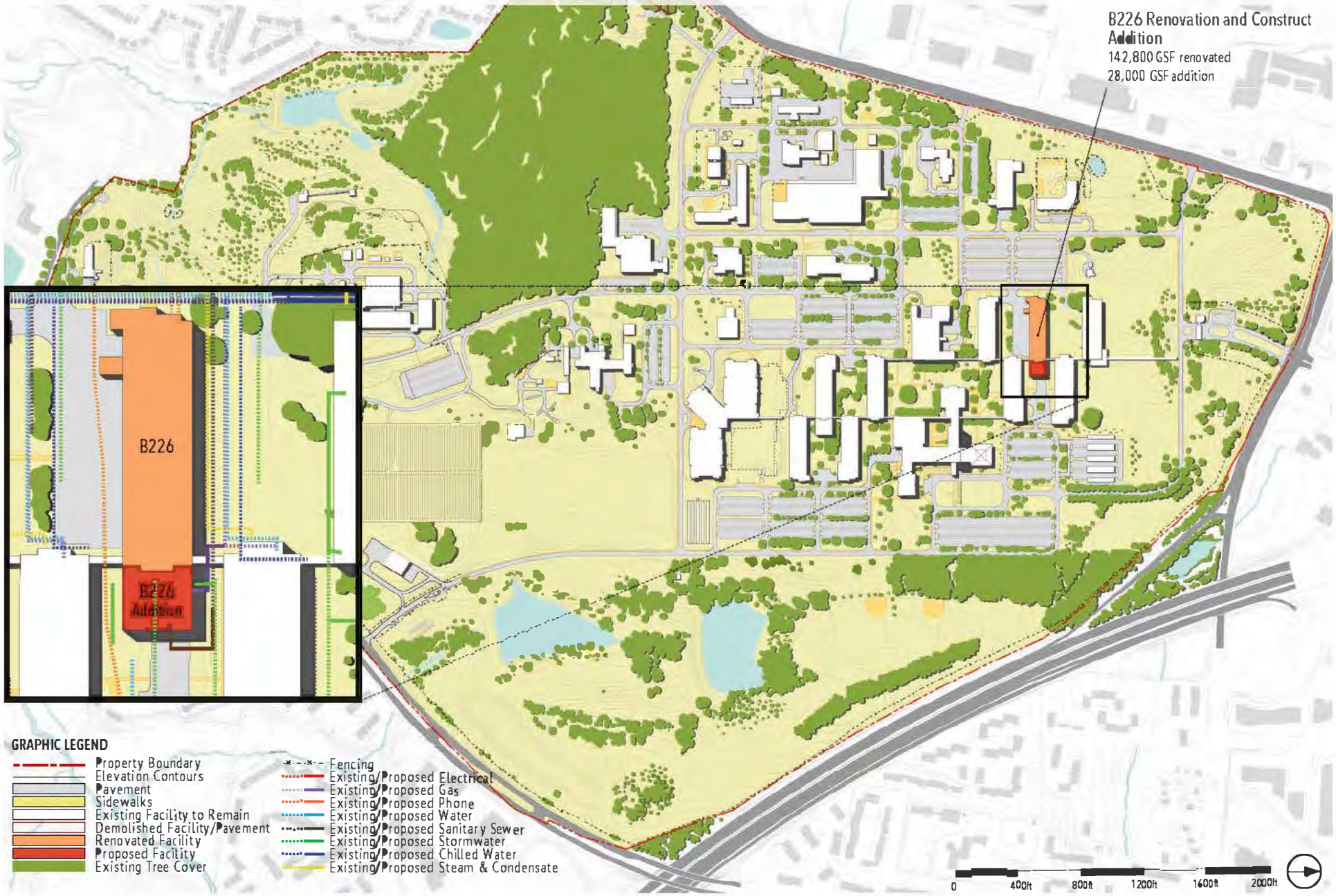
Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

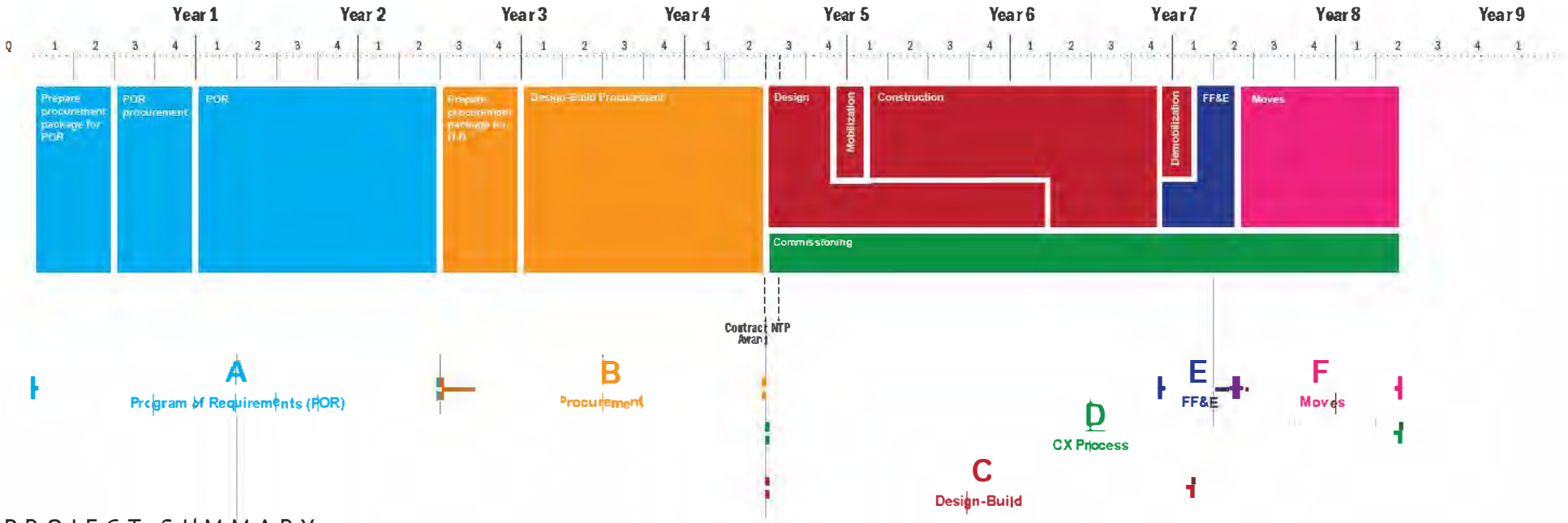
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

Intentionally Left Blank

BUILDING 226 RENOVATION & ADDITION



BUILDING 226: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Building 226 is one of the seven original GPLs, and is targeted to be the sixth to be renovated in the GPL Modernization Program. This project consists of renovating the 142,800 GSF facility and constructing a 28,000 GSF addition to become an advanced physical science research facility that pairs the historic pattern language of the existing GPLs with contemporary laboratory technology. The addition will help NIST accommodate future projected growth in staff and research programs. Unique among the GPLs, Building 226 was structurally adapted to specific building research needs and contains considerable high-bay laboratory space. In order to vacate the building for renovation, the Building 206 Renovation and Addition project must be completed first to provide high-bay swing space.

Building 226 was built in 1966 and has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. This brick curtain wall building consists of three levels of laboratories and offices but, given the high-bay configuration, the building has a single corridor- not the typical parallel double-loaded corridors of the other GPLs. Another unique characteristic is the exterior metal panels that clad one side of the building, also due to the high-bay spaces. Although much of the building is unchanged from the original construction, energy conservation improvements have been implemented such as installation of exterior wall insulation and energy efficient replacement windows. Building 226 is connected to the other historic GPLs and Building 101 through the concourse circulation corridor. The proposed renovation will be extensive - tearing back the building to the structure while maintaining key historic character-defining features. The design and construction of the addition will follow the Secretary of the Interior's Standards for the Treatment of Historic Structures.

The comprehensive project is estimated to take eight and a half years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just under three years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Building 206 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

BUILDING 226: DETAILED COST

This cost estimate is for 28,000 GSF of new construction (17%) and 142,800 GSF of renovation (83%). The renovation portion is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. For the area of the building under renovation, the estimate assumes a level 3 renovation. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The project includes modifications to the existing GPL to adapt the structure and building envelope to the new addition and to relocate some utilities.

Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

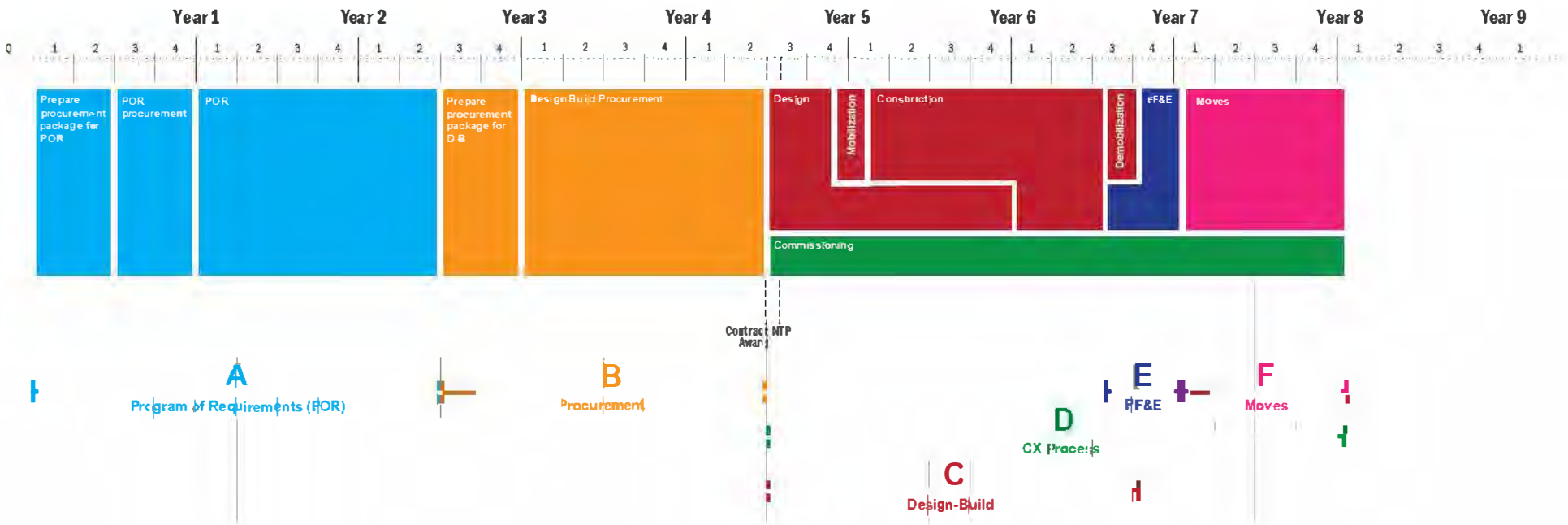
Owner's Institutional Support Tax

Total Project Cost

Intentionally Left Blank

BUILDING 222 RENOVATION & ADDITION

BUILDING 222 RENOVATION & ADDITION: COMPREHENSIVE PROJECT SCHEDULE



PROJECT SUMMARY

Building 222 is one of the seven original GPLs, and is planned to be the last to be renovated in the GPL Modernization Program. This project consists of renovating the 166,089 GSF facility and constructing a 28,000 GSF addition to become an advanced computer research facility that pairs the historic pattern language of the existing GPLs with contemporary laboratory technology. The renovation will result in computer laboratories and support spaces, offices, and collaboration spaces to support information technology, IT security, and communications technology research programs. The addition will help NIST accommodate future projected growth in staff and research programs.

Building 222 was built in 1966 and has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. This brick curtain wall building consists of three levels of mostly offices with a small number of laboratories and is the only GPL that has been significantly renovated, with most of its infrastructure replaced and new interior finishes installed. It is connected to the other historic GPLs and B101 through the concourse circulation corridor. The proposed renovation will be extensive - tearing back the building to the structure while maintaining key historic character-defining features. The design and construction of the addition will follow the Secretary of the Interior's Standards for the Treatment of Historic Structures.

The comprehensive project is estimated to take eight years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at about two and one half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Building 222 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

BUILDING 222 RENOVATION & ADDITION: DETAILED COST

This cost estimate is for 28,000 GSF of new construction (15%) and 166,089 GSF of renovation (85%). The renovation portion is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. For the area of the building under renovation, the estimate assumes a level 3 renovation. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The project includes modifications to the existing GPL to adapt the structure and building envelope to the new addition and to relocate some utilities.

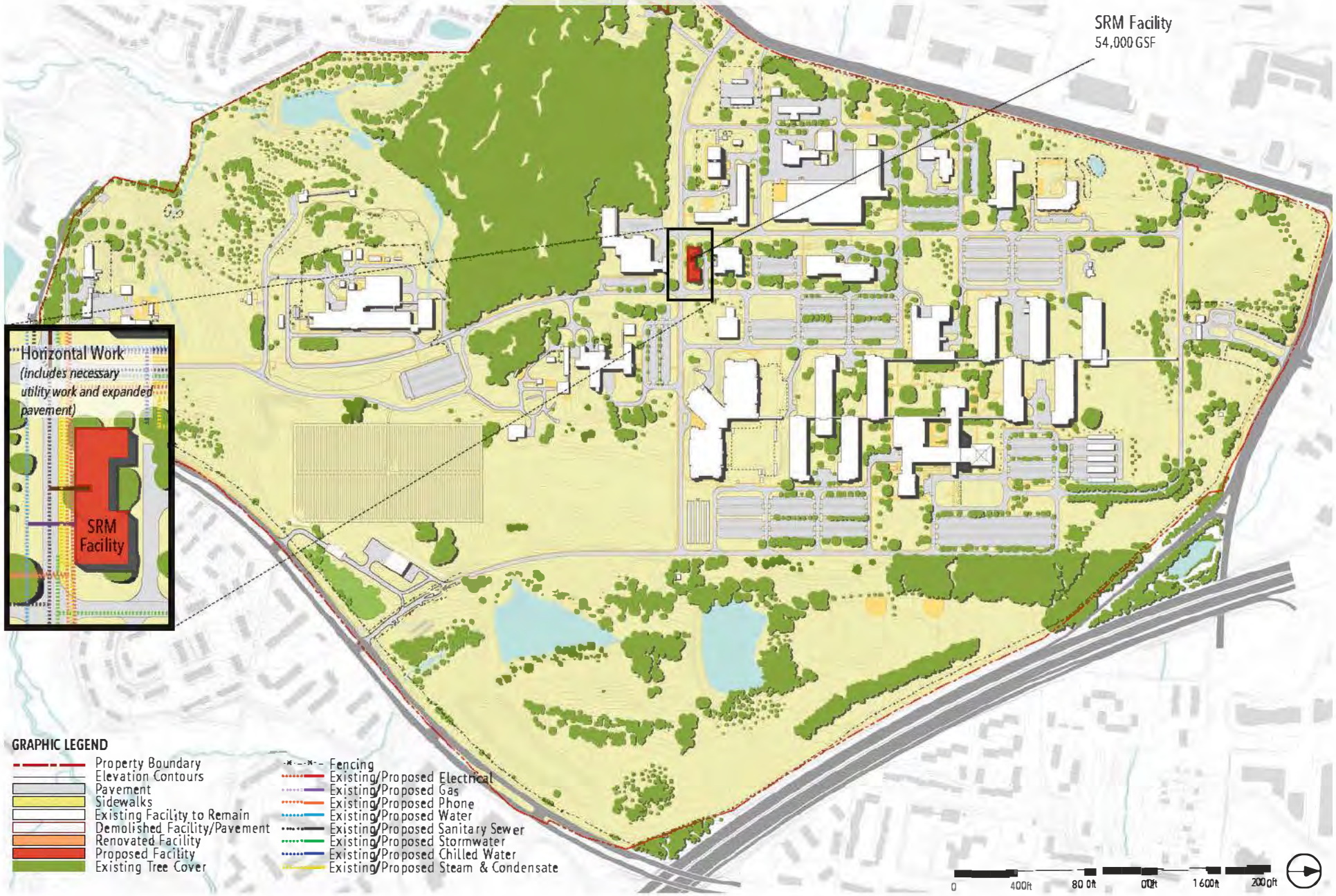
Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

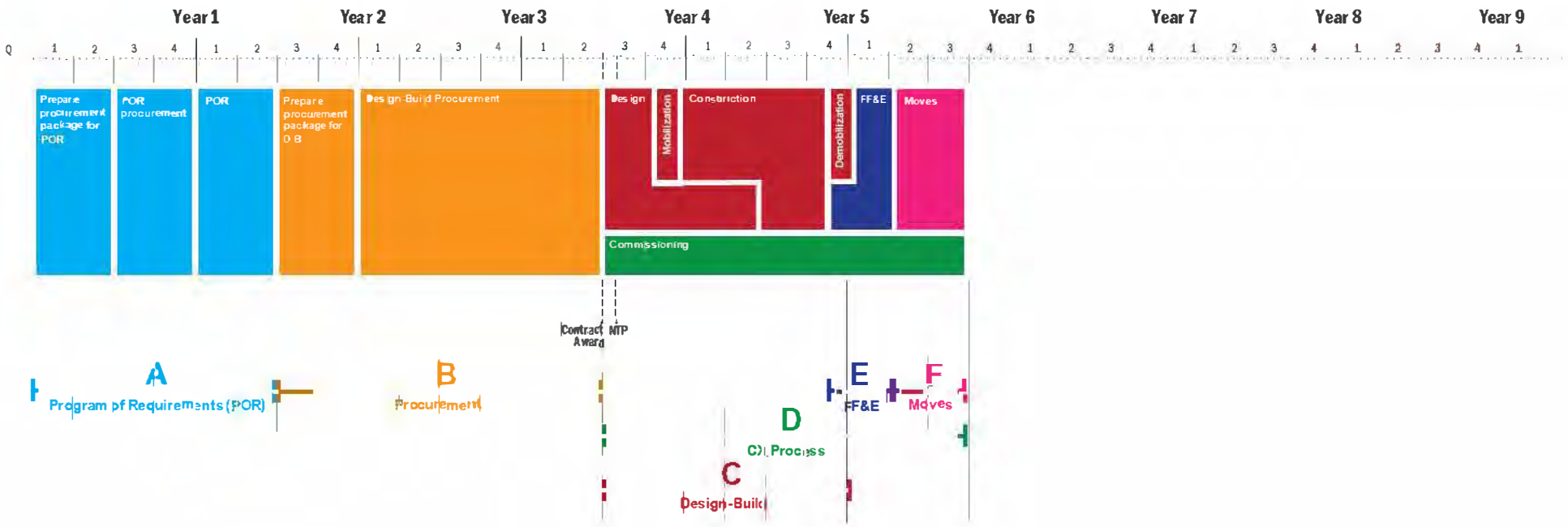
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

Intentionally Left Blank

STANDARD REFERENCE MATERIALS (SRM) FACILITY



SRM FACILITY: CONSOLIDATED PROJECT SUMMARY



PROJECT SUMMARY

The Standard Reference Material Facility is planned as a 54,000 GSF special-purpose facility that will support the preparation of ultra-high purity materials as well as refrigerated and frozen storage. It will position NIST to better support the rapidly increasing demand for Standard Reference Materials (SRMs) related to biologics. SRMs, the dissemination of which is a core service of NIST, are used by industry, academia and government organizations to verify measurements, calibrate instruments and validate quality assurance programs. The planned location for the new SRM facility is opposite Buildings 202 and 203, which house most of NIST's SRM operations, and it will share a loading access drive with Building 230.

The comprehensive project is estimated to take five and three-quarter years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract(B). The DB phase is estimated at just over one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Standard Reference Material Facility project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

SRM FACILITY: DETAILED COST

The cost estimate is calibrated to benchmarked costs for new construction of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction with specialized laboratory building requirements. The project includes horizontal work such as new utilities and extension of paving. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

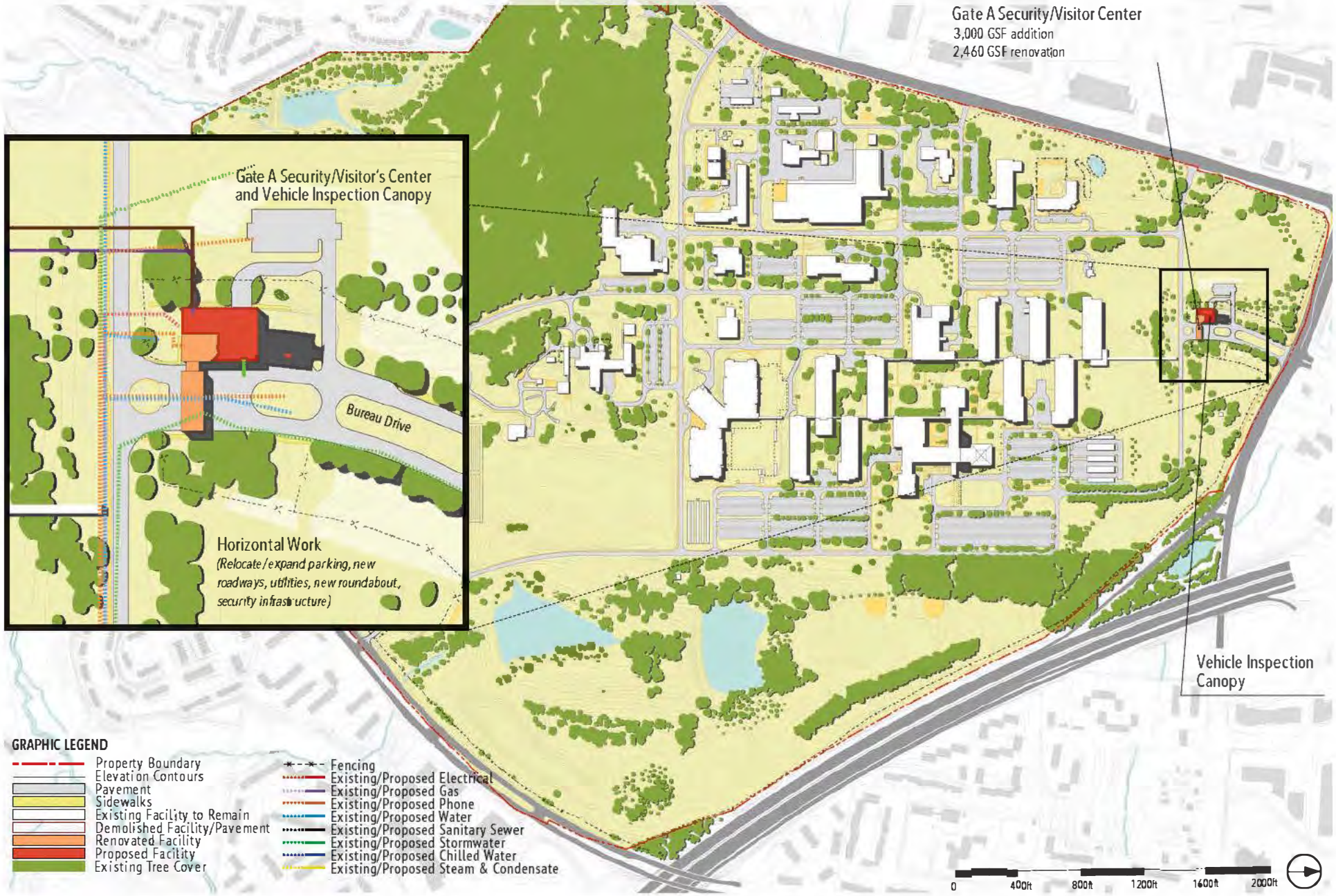
Subtotal Project Cost

Owner's Institutional Support Tax

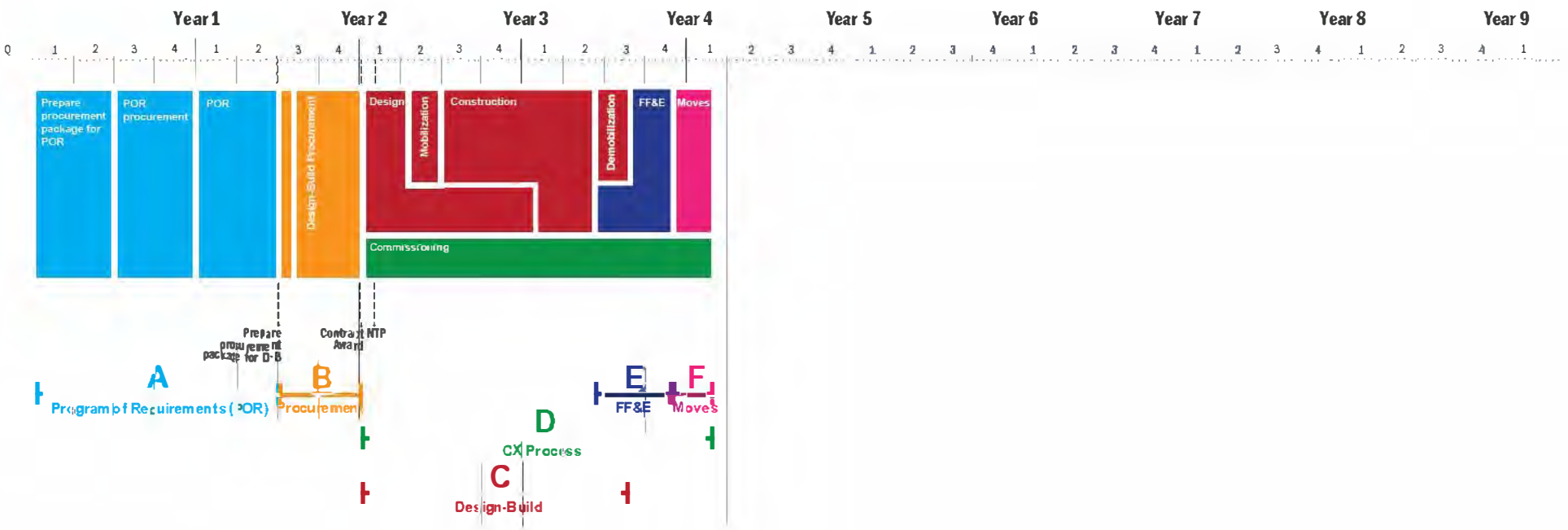
Total Project Cost

Intentionally Left Blank

GATE A SECURITY/VISITOR'S CENTER



GATE A SECURITY/VISITOR'S CENTER: CONSOLIDATED PROJECT SUMMARY



PROJECT SUMMARY

The Gate A Visitor Center Expansion and Screening project includes a 3,000 GSF expansion and reconfiguration of the existing Visitor Center, construction of a new vehicle inspection canopy, drive lanes and security infrastructure, relocation of the visitor parking lot, and other revisions to the roadways. Gate A is the primary entrance to the NIST Gaithersburg Campus and the only one of the six entrances that is operational 24/7. The entrance, located on Bureau Drive at MD Route 117 (West Diamond Road), is used by staff and all visitors except attendees to large conferences (who are directed to Gate F). This project will provide significant improvements to NIST's security screening of visitors and vehicles as well as ease congestion that frequently occurs at peak morning hours.

The comprehensive project is estimated to take just over four years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract(B). The DB phase is estimated at just over one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and equipment (F).

The Gate A Visitor Center Expansion and Screening project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

GATE A SECURITY/VISITOR'S CENTER: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 60% new construction and 40% renovation of the existing facility. The project includes a new vehicle inspection canopy. The horizontal work associated with the project includes relocation and expansion for the parking lot, new roadways, and a new roundabout. It includes an allowance for the upgrade of utilities and supporting security infrastructure. Detailed project cost estimates and additional project cost descriptions are located in the Appendix.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

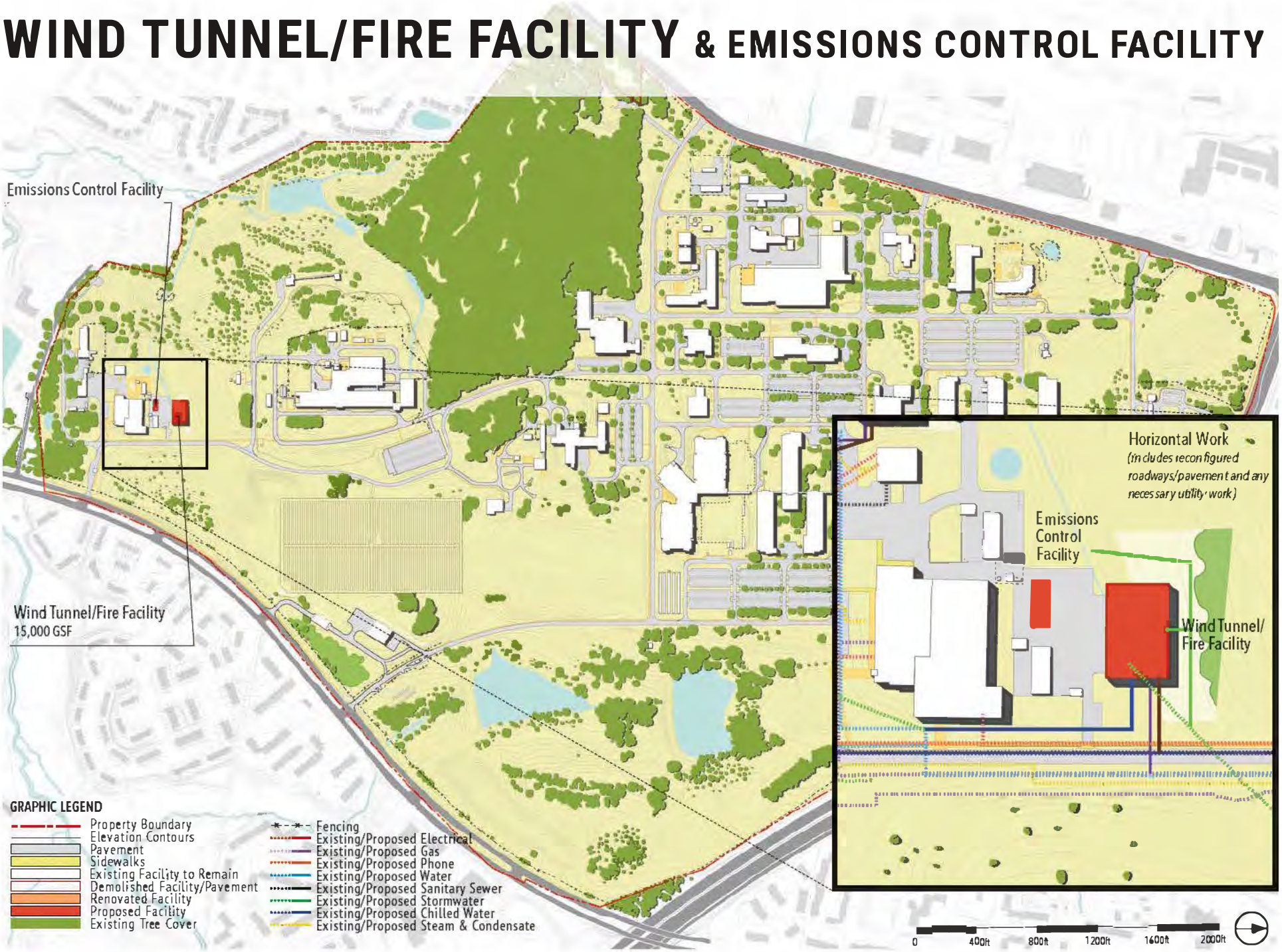
Subtotal Project Cost

Owner's Institutional Support Tax

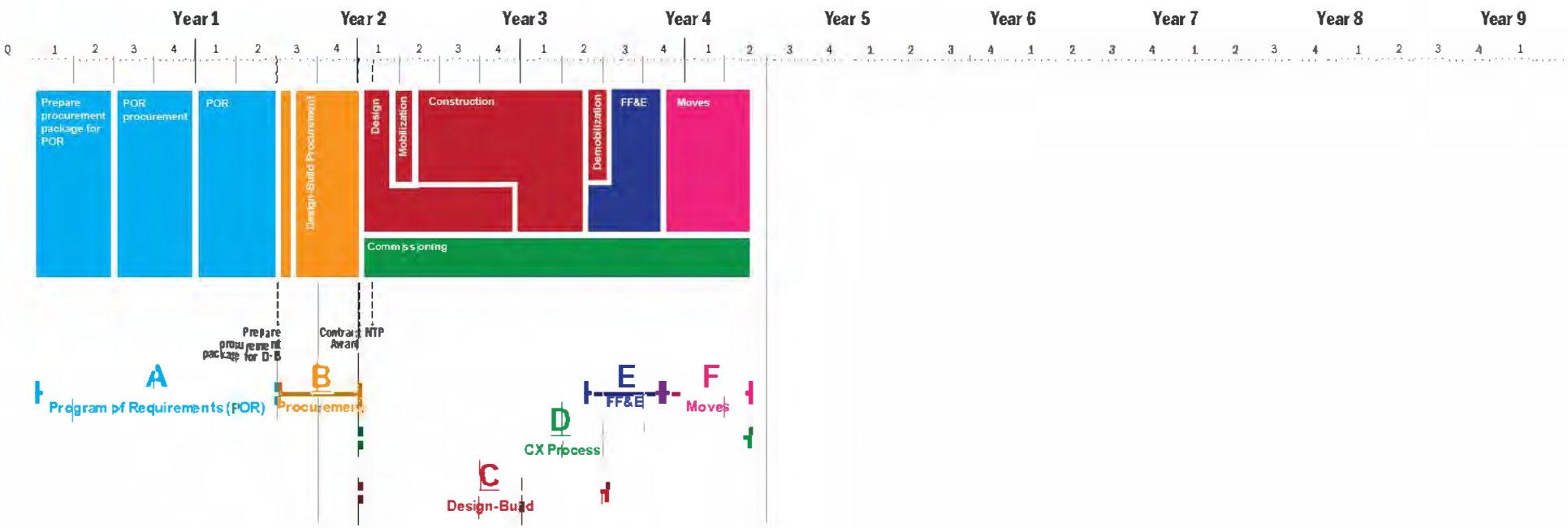
Total Project Cost

Intentionally Left Blank

WIND TUNNEL/FIRE FACILITY & EMISSIONS CONTROL FACILITY



WIND TUNNEL/FIRE FACILITY: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Wind Tunnel/Fire Facility project is a specialty laboratory that includes constructing a 15,000 GSF building and a new stand-alone Emissions Control Facility. This high-bay facility will function as a specialized wind tunnel for experiments associated with wind and fire incidents. The building will be located in the southern end of Campus and will require specialized process exhaust through a separate emissions control facility and special electrical power.

The comprehensive project is estimated to take four and a half years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract(B). The DB phase is estimated at just over one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Wind Tunnel/Fire Facility project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5). A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

WIND TUNNEL/FIRE FACILITY: DETAILED COST

The cost estimate is calibrated to benchmarked costs for new construction of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction with specialized laboratory building requirements. The project includes a new emissions control facility. The estimate includes horizontal work such as new utilities and extension of paving. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

Subtotal Project Cost

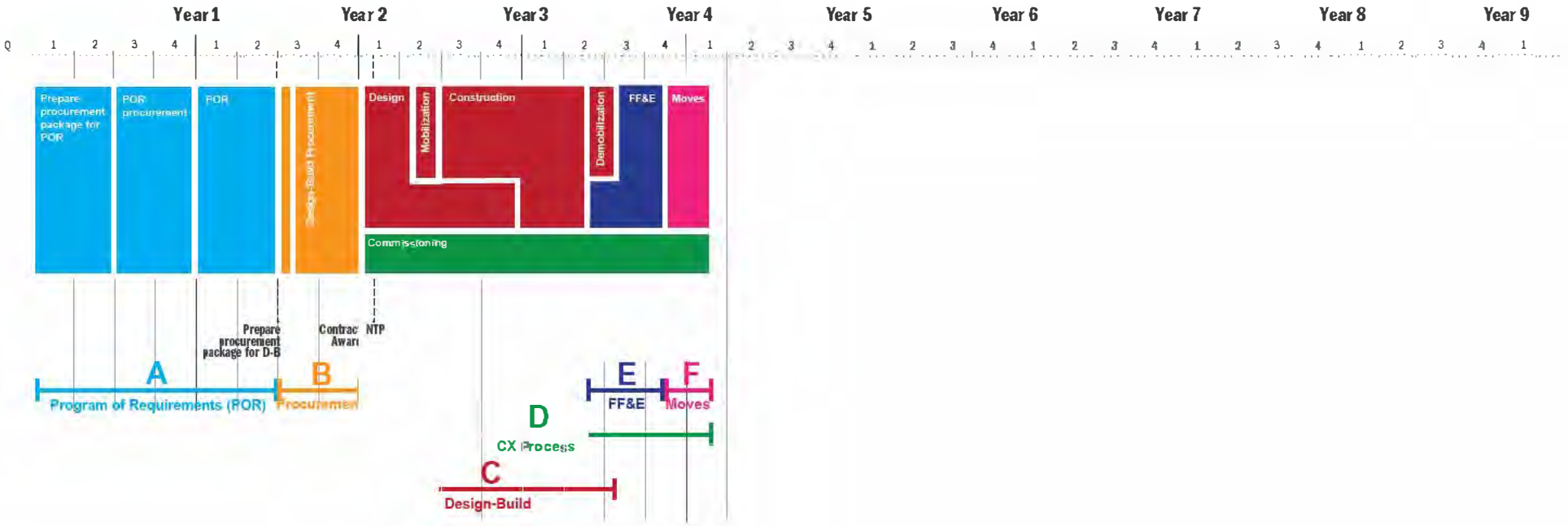
Owner's Institutional Support Tax

Total Project Cost

Intentionally Left Blank

GATE F VISITOR CENTER

GATE F VISITOR'S CENTER: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Gate F Visitor Center project includes constructing a 4,400 GSF Visitor Center building and an adjacent vehicle inspection canopy with drive lanes and security infrastructure, entrance and exit lanes, and a parking lot. The Visitor Center is planned to be a net-zero energy, LEED Platinum certified building. This project will follow the construction of the Gate F Shipping, Receiving, and Inspection facility that separates commercial delivery vehicles from staff and visitor traffic. It will enable NIST to screen visitors attending large conferences and alleviate back-ups at Gate A that impact daily operations, as well as provide additional security capability and flexibility.

The comprehensive project is estimated to take just over four years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract(B). The DB phase is estimated at one and one half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and equipment (F).

The Gate F Visitor's Center project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

GATE F VISITOR'S CENTER: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction. The estimate includes horizontal work such new roadways, parking, and inspection areas. It includes an allowance for the upgrade of utilities and supporting security infrastructure. Detailed project cost estimates and additional project cost descriptions are located in the Appendix.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

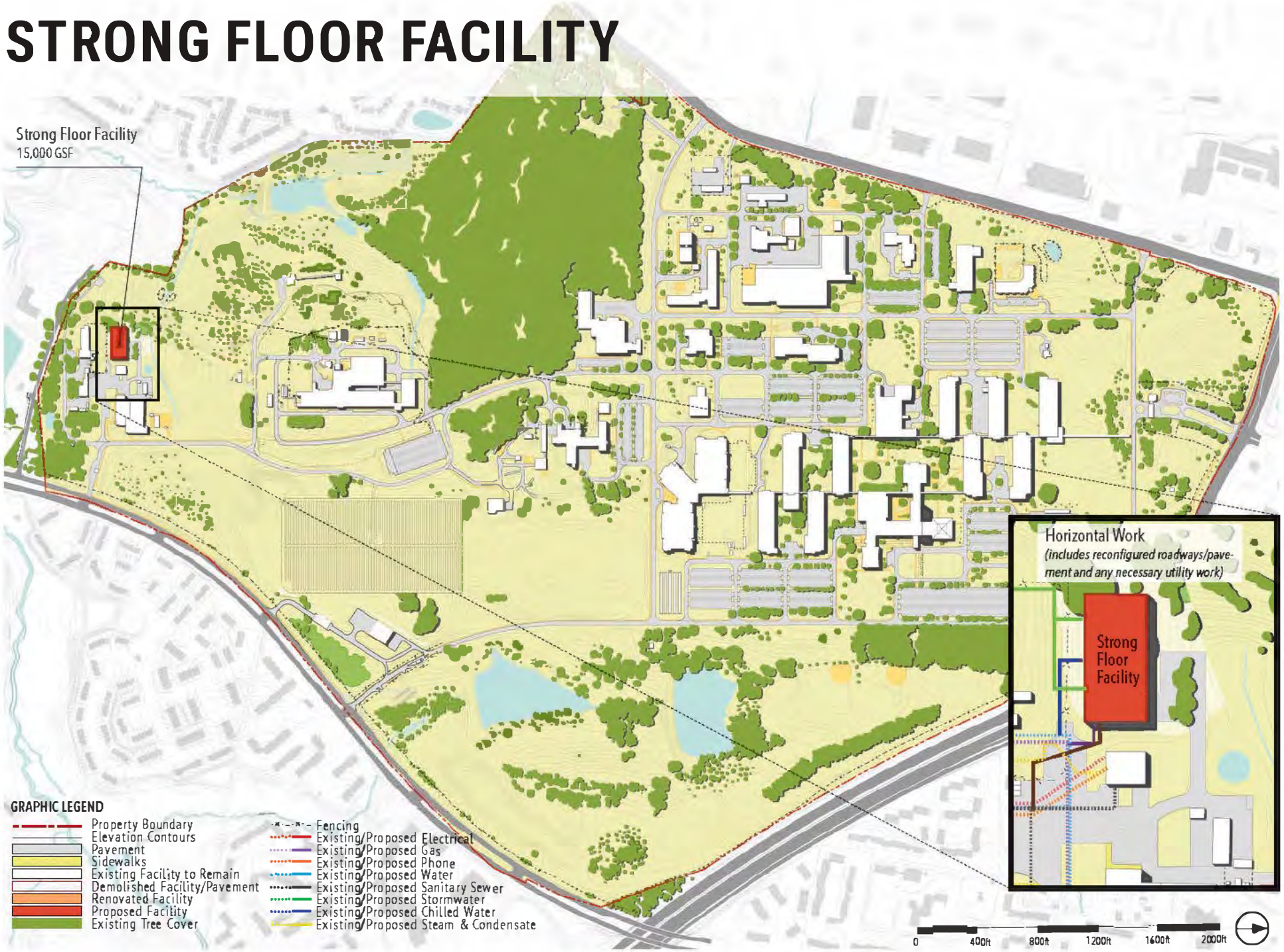
Subtotal Project Cost

Owner's Institutional Support Tax

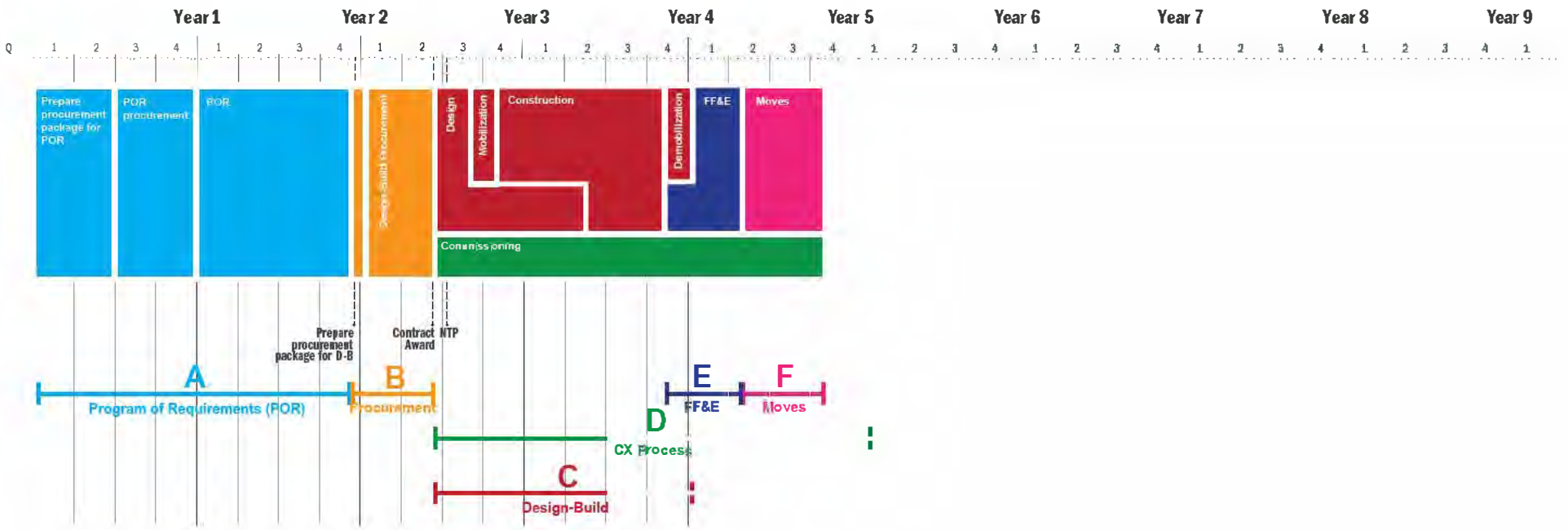
Total Project Cost

Intentionally Left Blank

STRONG FLOOR FACILITY



STRONG FLOOR FACILITY: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Strong Floor Facility is planned as a 15,000 GSF specialty laboratory for structural research using full-scale models of beams-columns, shear walls, and other elements. This high-bay facility will be located in the southern end of Campus. It will be equipped with specialized architectural features, environmental control systems, and equipment such as a strong floor, strong wall, and hydraulic power systems for gravity and lateral load testing.

The comprehensive project is estimated to take just under five years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Strong Floor Facility project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

STRONG FLOOR FACILITY: DETAILED COST

The cost estimate is calibrated to benchmarked costs for new construction of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction with specialized laboratory building requirements. The estimate includes horizontal work such as new utilities and extension of paving. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

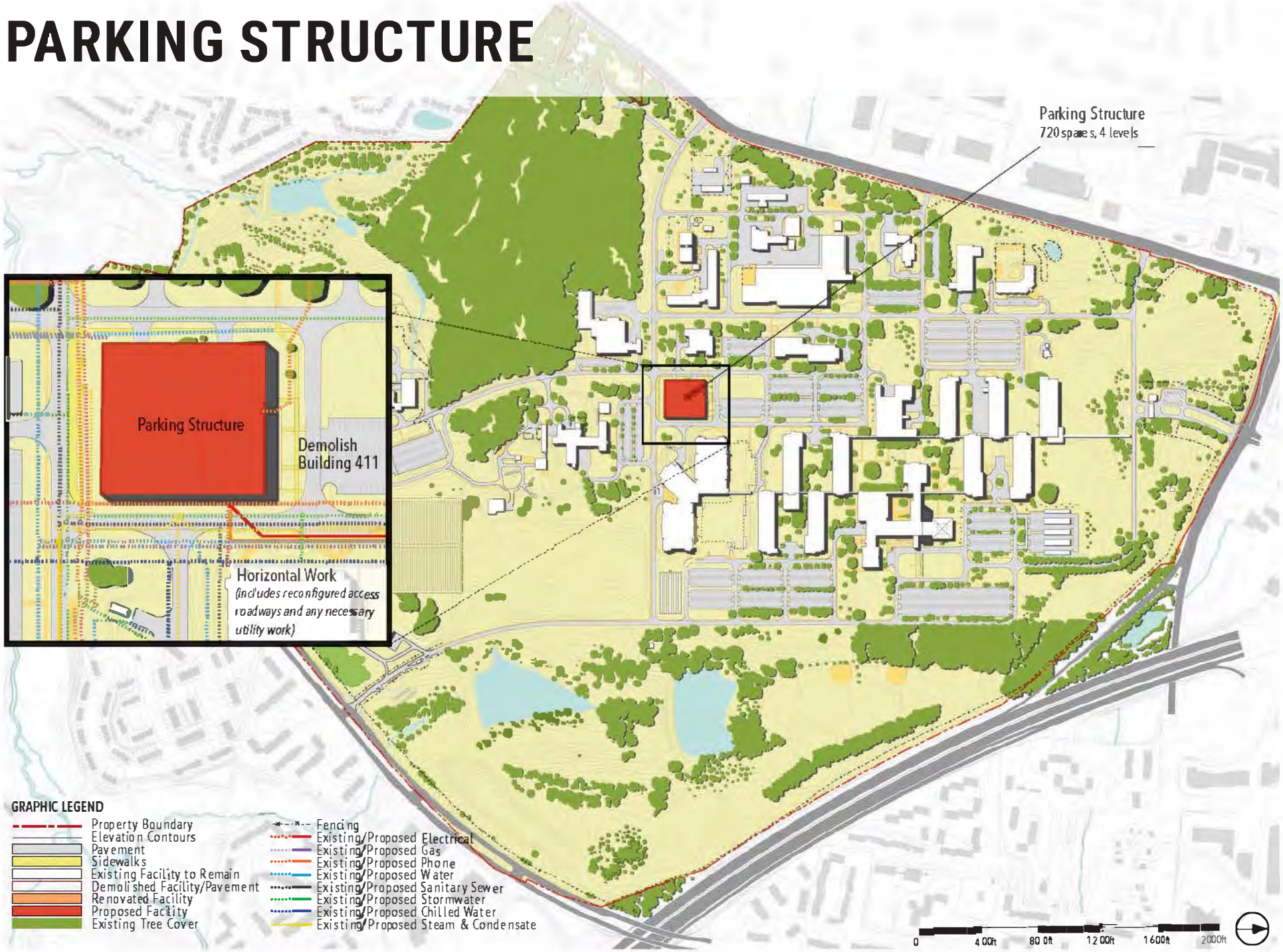
Subtotal Project Cost

Owner's Institutional Support Tax

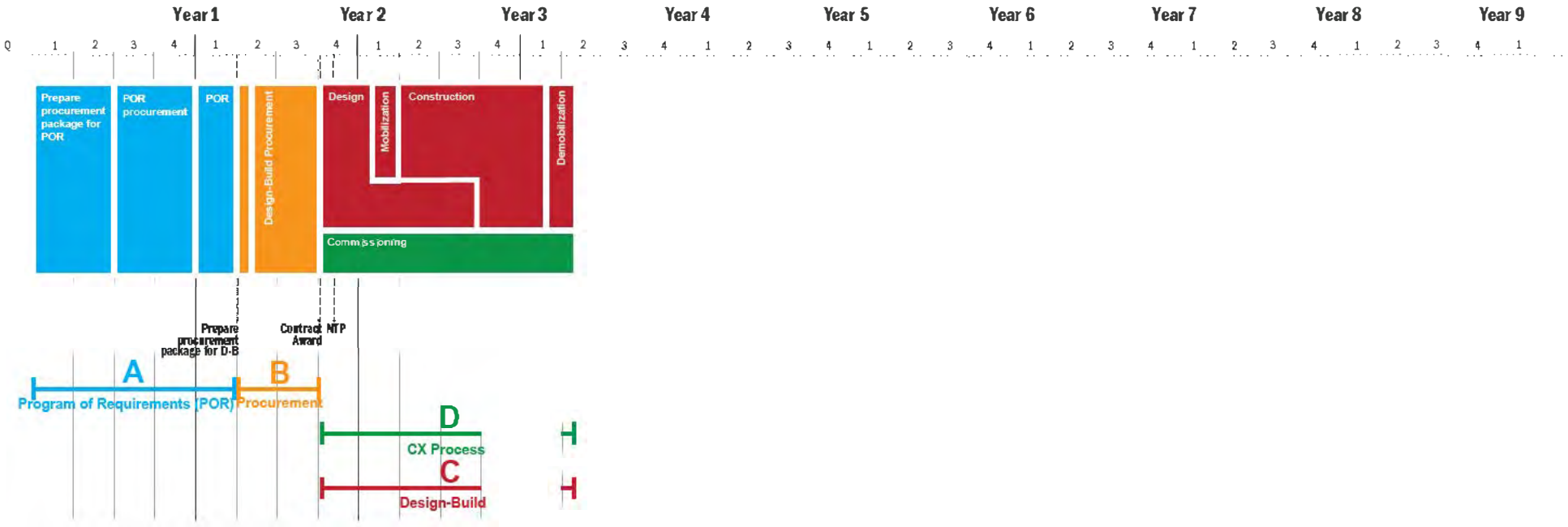
Total Project Cost

Intentionally Left Blank

PARKING STRUCTURE



PARKING STRUCTURE: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Parking Structure is planned to accommodate 720 parking spaces over 4 levels and will require demolishing Building 411, a modular office building that has exceeded its anticipated useful life, and reconfiguring access roadways. The construction of the parking structure is needed prior to constructing new Research Buildings II, III, and IV because they are sited on existing central parking lots. The capacity of these lots will be replaced in the parking structure and additional capacity is included to address projected staff growth. Sustainability features will be incorporated in the parking structure to include solar panels on the upper level and electric vehicle charging stations.

The comprehensive project is estimated to take three and a half years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a quarter years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at one and a half years (C). Enhanced commissioning (D) will start in design and continue through construction.

The Parking Garage project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5). A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

PARKING STRUCTURE: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction. The project includes the demolition of Build 411. The estimate includes horizontal work such as new utilities and construction of access roads. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

(b)(5)

Project Cost Summary (Escalated to FY2021)

- Primary Facilities
- Supporting Facilities
- Additional Project Costs (IT/Security)
- Design Contingency
- Construction Contingency

Estimated Construction Cost

- Predesign
- Design
- Permits
- Construction Management Oversight & Commissioning
- PCAS/LEED Certification
- Furniture, Fixtures, & Equipment
- Moving Costs

Owner's Additional Project Costs

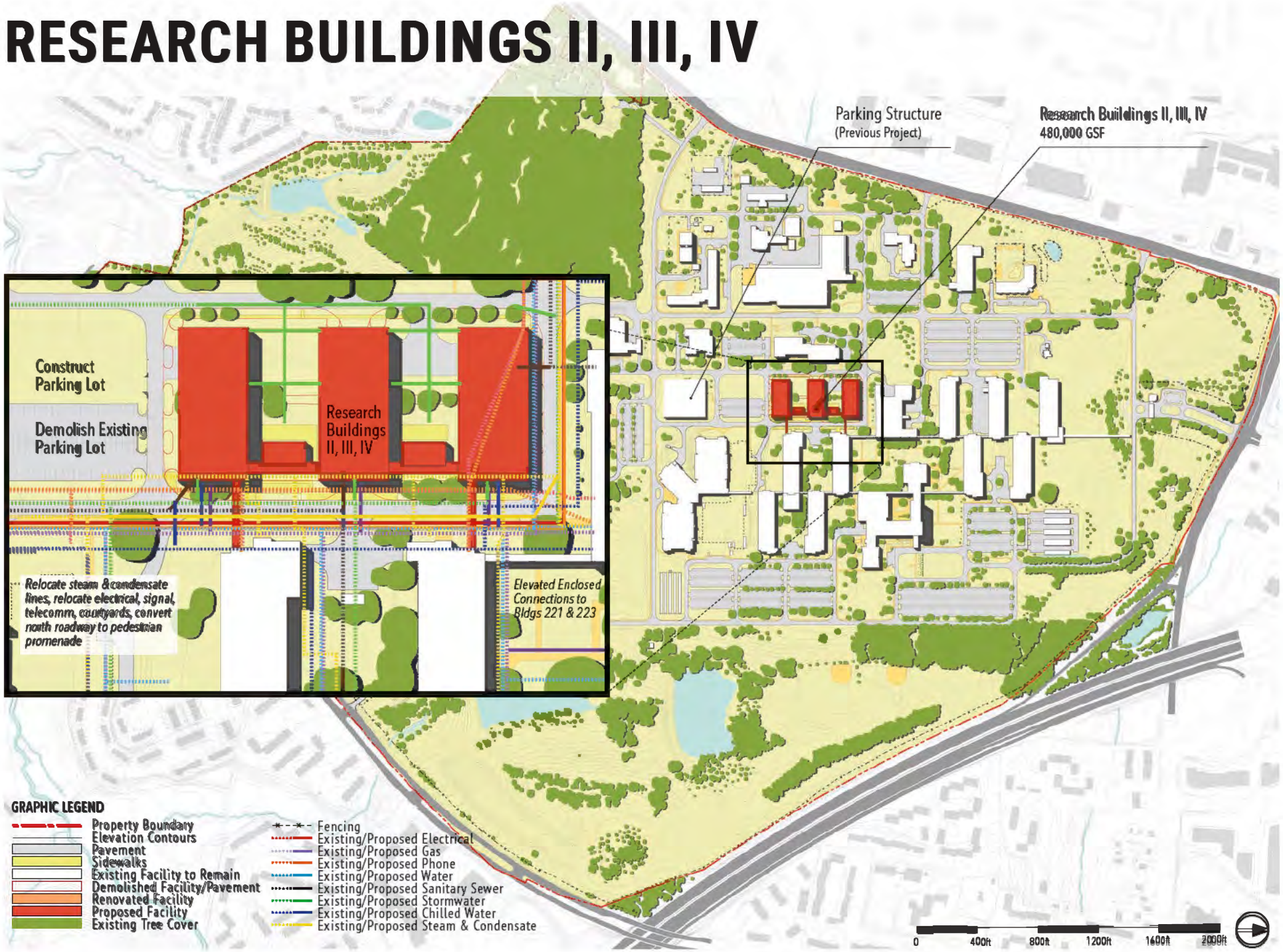
Subtotal Project Cost

Owner's Institutional Support Tax

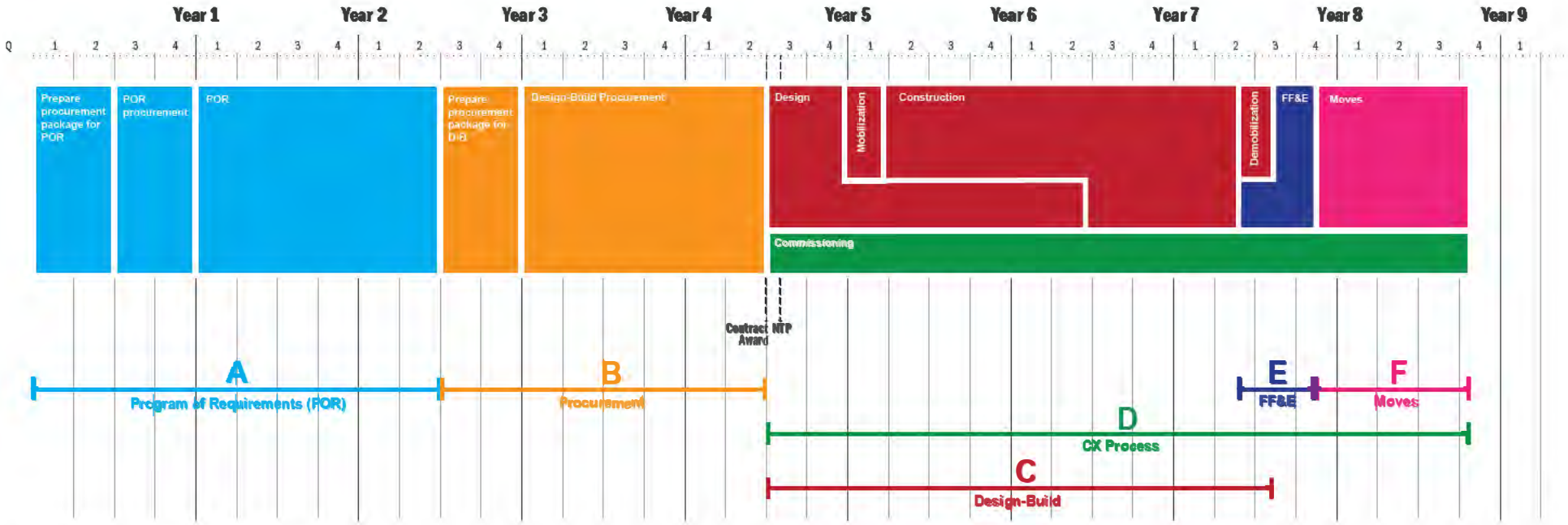
Total Project Cost

Intentionally Left Blank

RESEARCH BUILDINGS II, III, IV



RESEARCH BUILDINGS II, III, IV: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

Research Buildings II, III, and IV are planned to be advanced physical science research buildings with a combined total size of 480,000 GSF. These laboratory buildings are anticipated to be more sophisticated than can be supported in a renovated GPL, providing the infrastructure and controlled environments needed for NIST's advanced measurement science programs, as well as accommodate anticipated growth in staff and research programs. Flexibility is incorporated into the planning of these facilities as Research Building IV could be constructed separately from the others in response to NIST's research requirements. Each facility is planned to be three stories with a mechanical penthouse level, and Buildings II and III will share a basement level for laboratories requiring the most stringent environmental controls. The research buildings will be located in the Campus core, just to the west of Buildings 221 and 223 and will have elevated enclosed connectors to the existing buildings and, therefore, to the pedestrian circulation concourse connecting the center core of the Campus. They will share the orientation of the GPLs and follow the established rhythm of the existing buildings separated by courtyard space. Connectors between Research Buildings II, III, and IV will also have collaboration and meeting spaces, with outdoor courtyards for staff enjoyment. A new pedestrian promenade will be created adjacent to the new research facilities. This project will require the relocating of several utilities out of the proposed buildings' footprint, and campus chilled water capacity will need to be increased as well as standby power provided to serve these buildings.

The comprehensive project is estimated to take nearly nine years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at three years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Research Buildings II, III, and IV project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

RESEARCH BUILDINGS II, III, IV: DETAILED COST

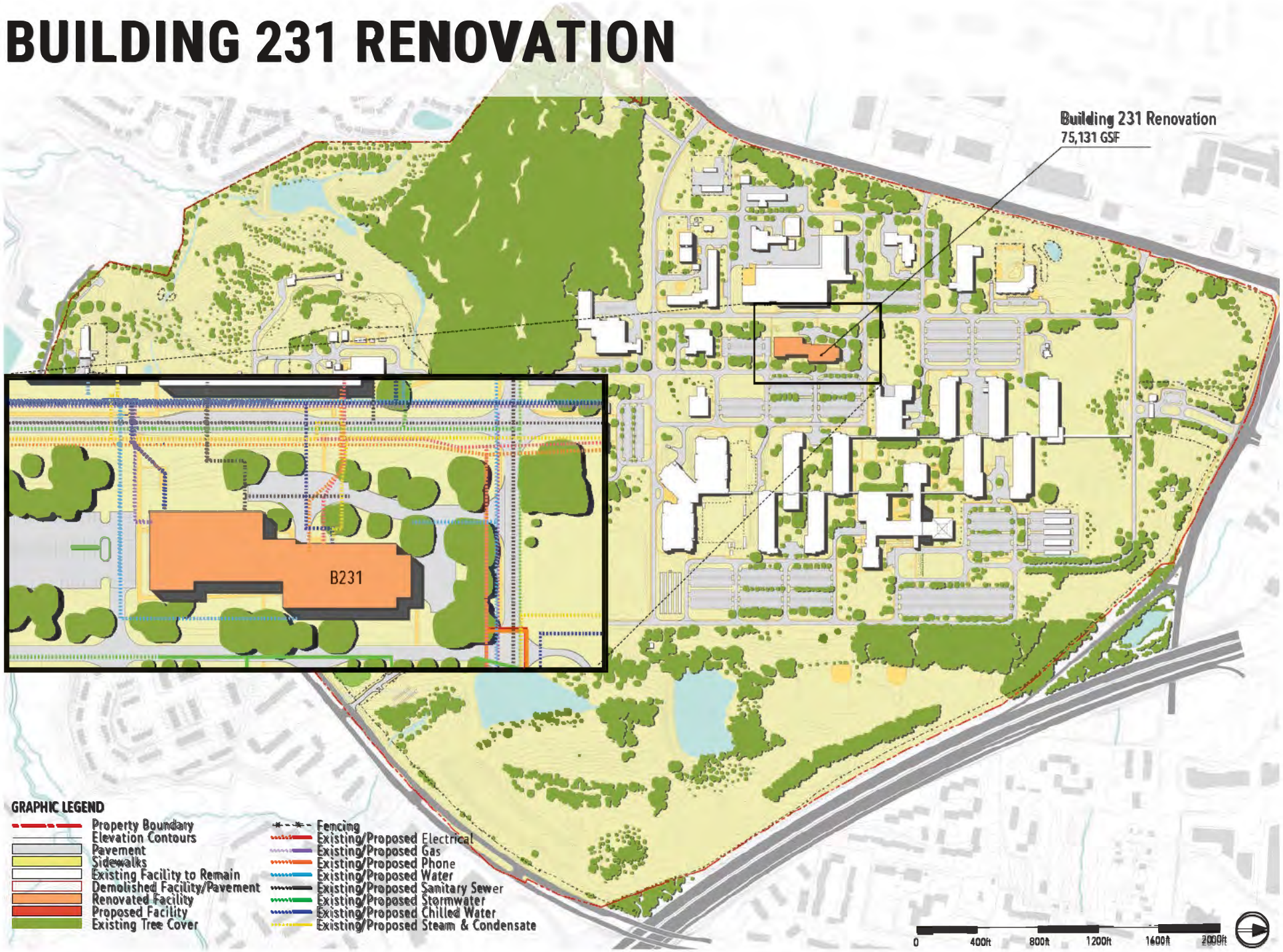
The cost estimate is calibrated to benchmarked costs for new construction of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the buildings are 100% new construction with specialized laboratory building requirements. The project includes elevated and enclosed connections to Buildings 221 and 223 and construction of courtyards. The horizontal work includes demolition of the existing parking lots on the site, conversion of the north roadway to a pedestrian promenade, and expansion of the surface parking lot. The estimate also includes the relocation of steam and condensate lines as well as electrical and signal/telecomm. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

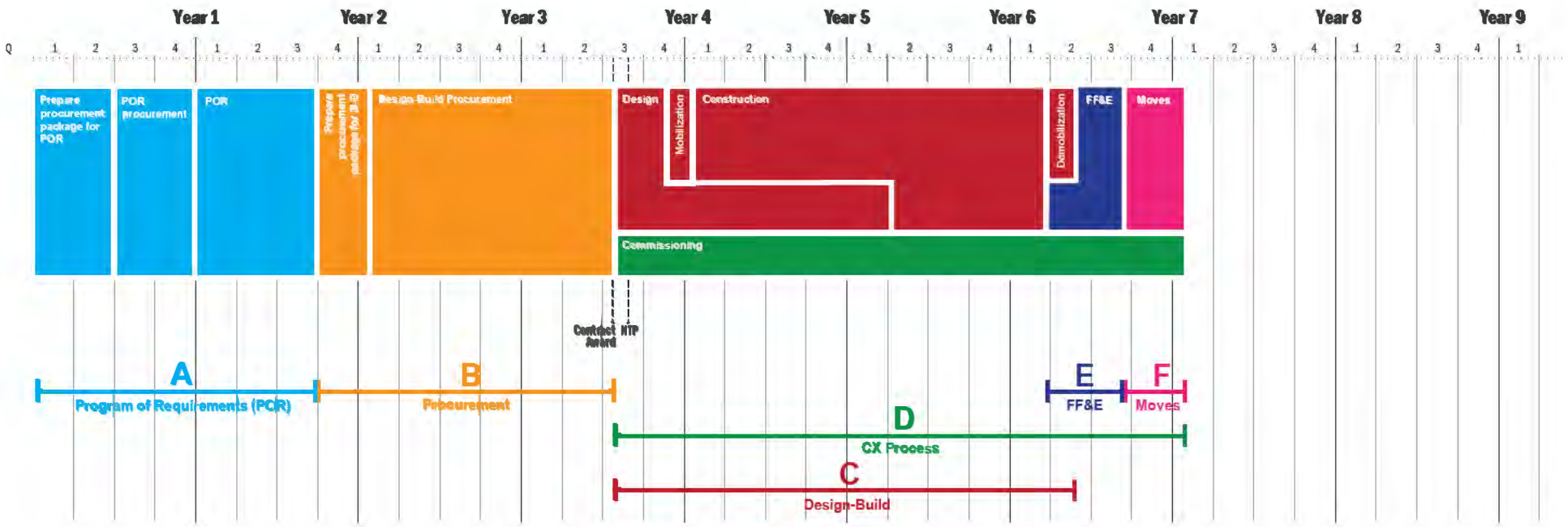
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	[redacted]
Supporting Facilities	[redacted]
Additional Project Costs (IT/Security)	[redacted]
Design Contingency	[redacted]
Construction Contingency	[redacted]
Estimated Construction Cost	[redacted]
Predesign	[redacted]
Design	[redacted]
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

Intentionally Left Blank

BUILDING 231 RENOVATION



BUILDING 231: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Building 231 project consists of renovating the existing 75,131 GSF special purpose laboratory building with upgrades or replacements of its infrastructure systems, and improvements to the exterior walls and interior finishes. The planned renovation will need to be accomplished through carefully phased upgrades to limit the disturbances to the existing research programs that are not practical to relocate due to their specialized space or equipment.

Constructed in 1968, Building 231 (Industrial Building) has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. This free-standing facility consists of a basement and two above-grade levels and shares the light beige brick exterior and simple architectural features of the GPLs and other early laboratory buildings. It's physcial arrangement consists of two independent wings, one secure wing dedicated to proprietary testing and research and a second high-bay wing housing the NIST Kolsky bar facility and the NIST Center for Automotive Light-Weighting.

The comprehensive project is estimated to take seven years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and three-quarters years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at approximately three years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in, as needed, of staff and new equipment (F). Several of these project phases will, in reality, overlap due to the phased nature of the renovation work.

The Building 231 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

BUILDING 231: DETAILED COST

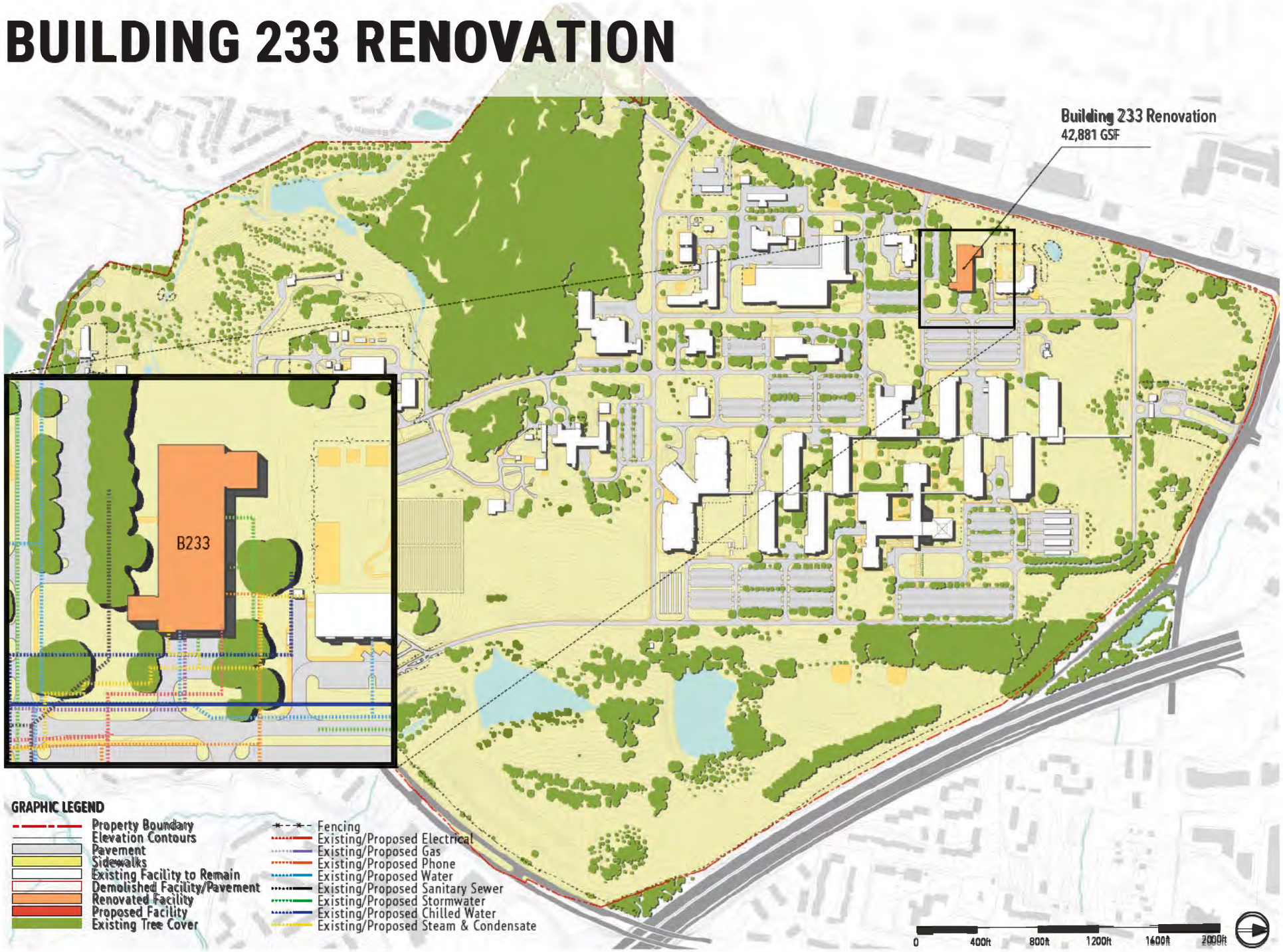
The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. The estimate assumes the building is 100% level 2 renovation with specialized laboratory building requirements. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate does not include horizontal work. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

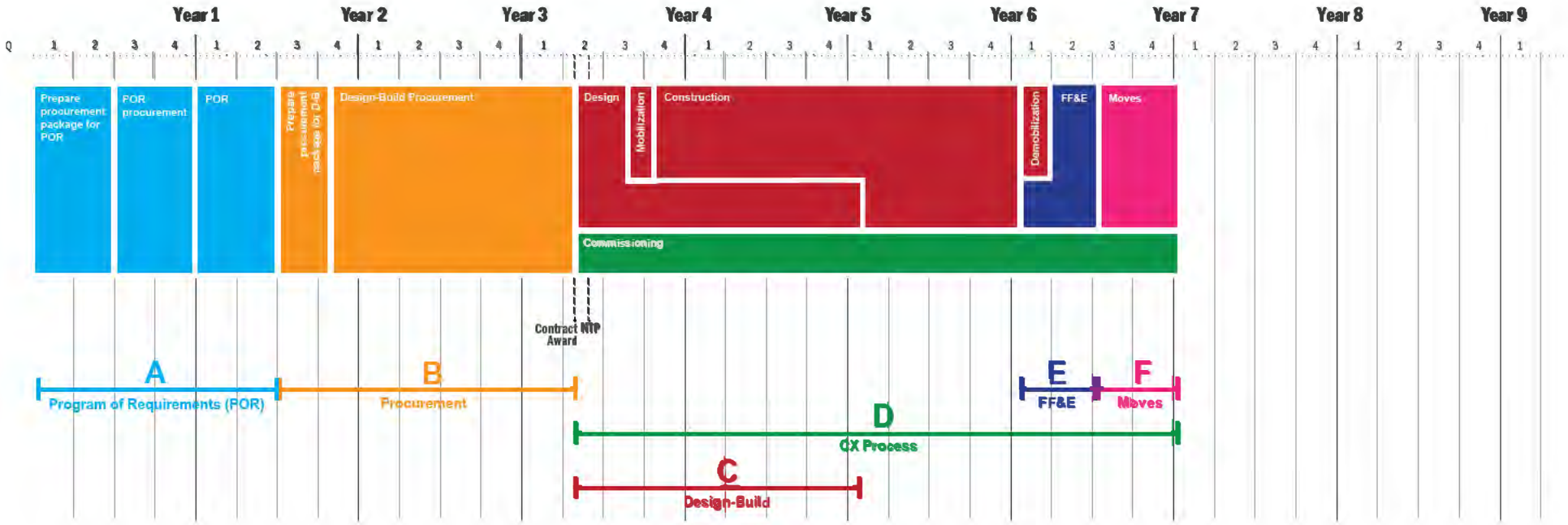
Project Cost Summary (Escalated to FY2021)		
Primary Facilities		
Supporting Facilities		
Additional Project Costs (IT/Security)		
Design Contingency		
Construction Contingency		
Estimated Construction Cost		
Predesign	[redacted]	[redacted]
Design		
Permits		
Construction Management Oversight & Commissioning	[redacted]	[redacted]
PCAS/LEED Certification		
Furniture, Fixtures, & Equipment		
Moving Costs		
Owner's Additional Project Costs		
Subtotal Project Cost		
Owner's Institutional Support Tax		
Total Project Cost		

Intentionally Left Blank

BUILDING 233 RENOVATION



BUILDING 233: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Building 233 project consists of renovating the existing 42,888 GSF special purpose laboratory building with upgrades or replacements of its infrastructure systems, and improvements to the exterior walls and interior finishes. The planned renovation will need to be accomplished through at least two phases to limit the disturbances to the existing research programs that are not practical to relocate due to their specialized space or equipment.

Constructed in 1968, Building 233 (Sound Building) has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. This free-standing facility, originally dedicated to sound research, consists of one occupiable level and shares the light beige brick exterior and simple architectural features of the GPLs and other early laboratory buildings. In addition to offering typical laboratory and office environments, two specially constructed research areas—one for acoustics studies and another for manufacturing process metrology—are appended to each end of the building.

The comprehensive project is estimated to take seven years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just over two and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in, as needed, of staff and new equipment (F).

The Building 233 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

BUILDING 233: DETAILED COST

The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. The estimate assumes the building is 100% level 2 renovation with specialized laboratory building requirements. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate does not include horizontal work. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

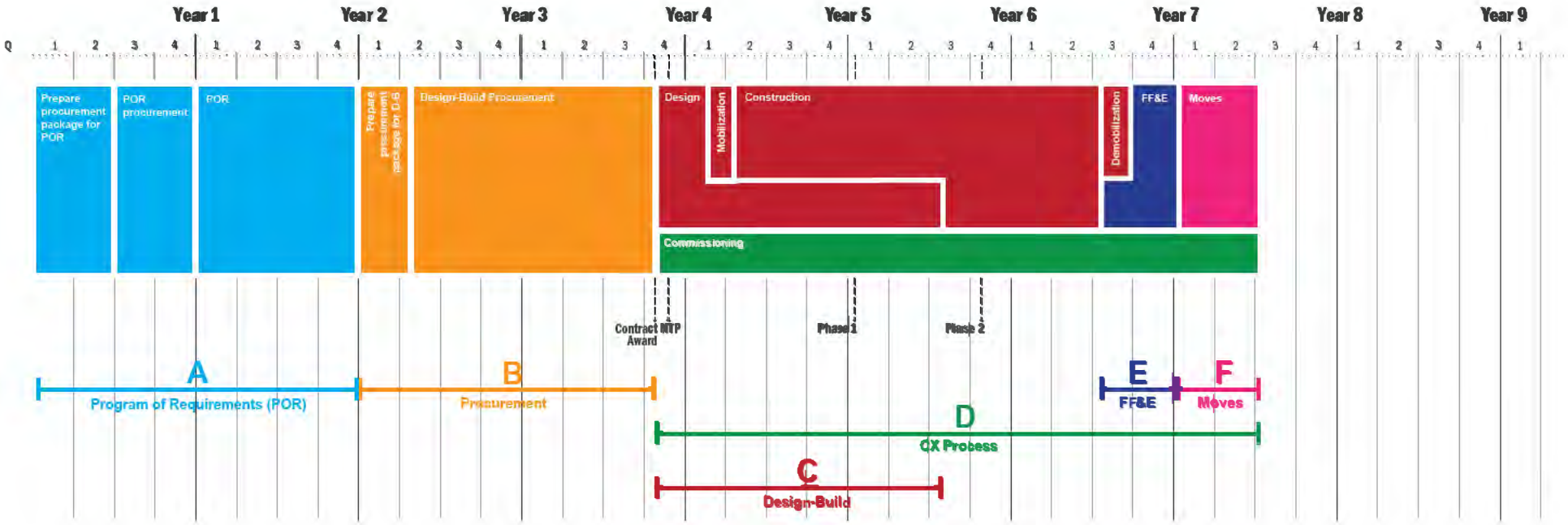
(b)(5)

Project Cost Summary (Escalated to FY2021)
Primary Facilities
Supporting Facilities
Additional Project Costs (IT/Security)
Design Contingency
Construction Contingency
Estimated Construction Cost
Predesign
Design
Permits
Construction Management Oversight & Commissioning
PCAS/LEED Certification
Furniture, Fixtures, & Equipment
Moving Costs
Owner's Additional Project Costs
Subtotal Project Cost
Owner's Institutional Support Tax
Total Project Cost

Intentionally Left Blank

BUILDING 202 RENOVATION

BUILDING 202: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Building 202 project consists of renovating the 78,577 GSF special purpose laboratory building with upgrades or replacements of its infrastructure systems, and improvements to the exterior walls and interior finishes. The planned renovation will need to be accomplished through carefully phased upgrades to limit the disturbances to the existing research programs that are not practical to relocate due to their specialized space or equipment.

Constructed in 1962, Building 202 (Engineering Mechanics) has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. As the first laboratory building on the NIST Gaithersburg Campus, Building 202 was constructed for large scale material testing and continues to serve that function. It is a one-of-a-kind facility with a large 12,700 GSF test area at its core, which partially towers above the four levels of adjacent testing and weight rooms, and houses equipment for heavy weight impact testing of large scale materials. The building is structurally designed to handle the effects of high impact load testing. The east side of the building features a two-story wing of red brick that houses offices and labs, and which served as the National Bureau of Standards Headquarters offices until Building 101 was completed. The remainder of the building shares the light beige brick exterior and simple architectural features of the GPLs and other early laboratory buildings.

The comprehensive project is estimated to take seven and a half years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated to be less than two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in, as needed, of staff and scientific equipment (F). Several of these project phases will, in reality, overlap due to the phased nature of the renovation work.

The Building 202 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

BUILDING 202: DETAILED COST

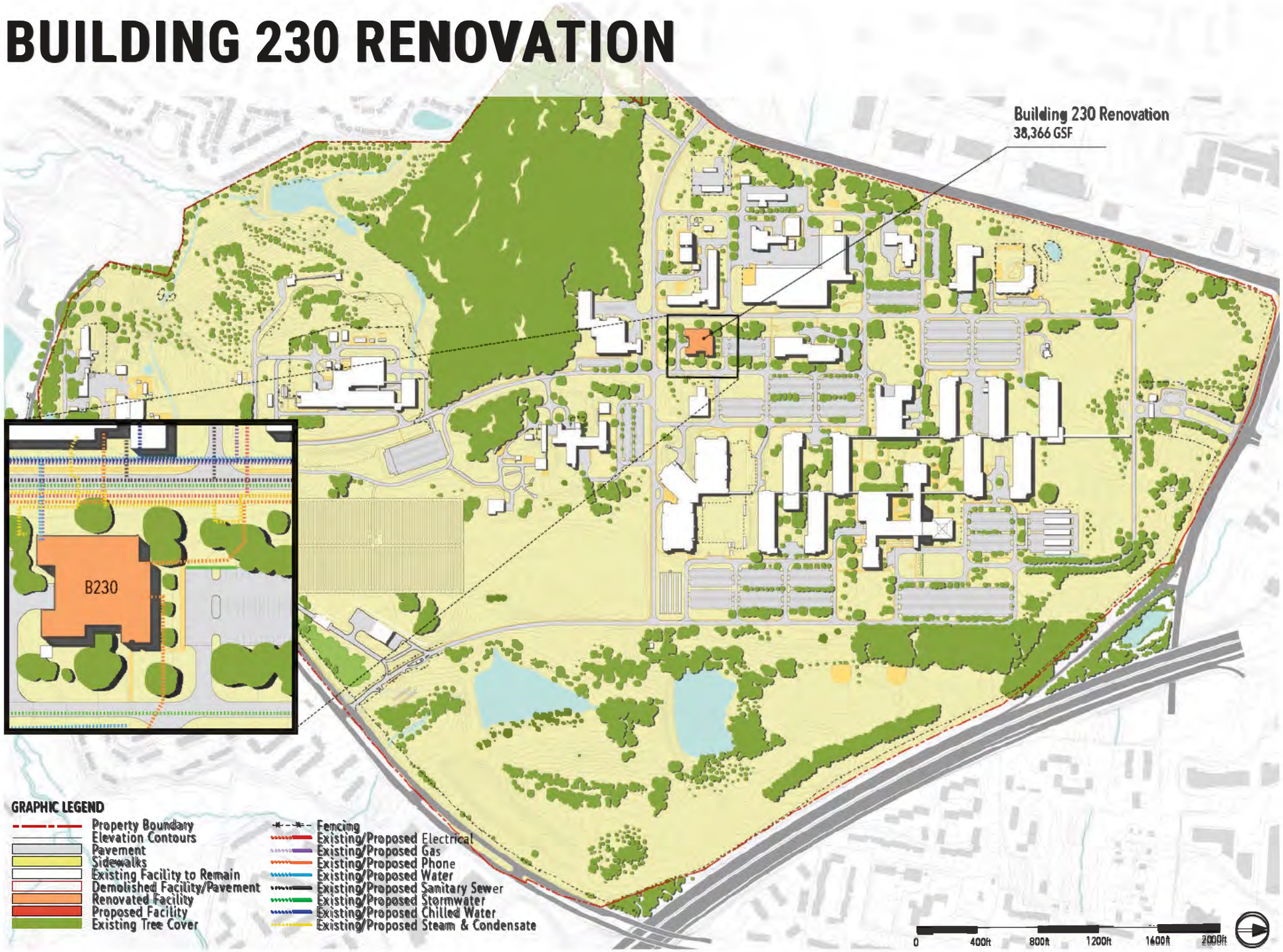
The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. The estimate assumes the building is 100% level 2 renovation with specialized laboratory building requirements. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate does not include horizontal work. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

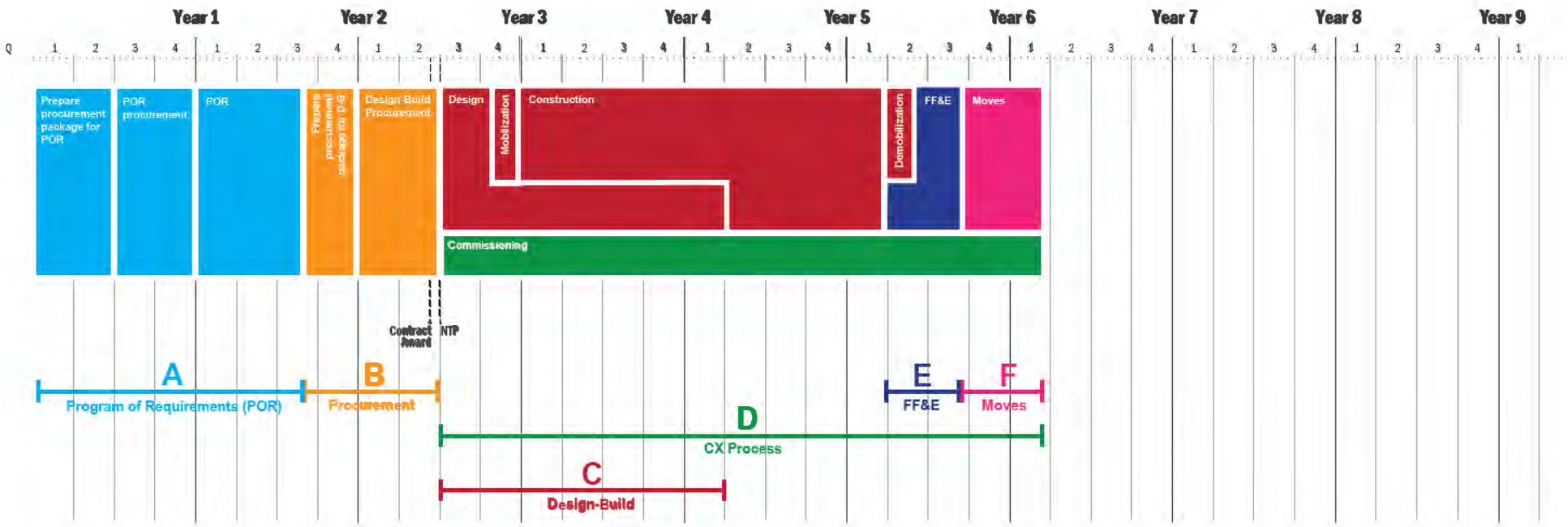
Project Cost Summary (Escalated to FY2021)		
Primary Facilities		
Supporting Facilities		
Additional Project Costs (IT/Security)		
Design Contingency		
Construction Contingency		
Estimated Construction Cost		
Predesign		
Design		
Permits		
Construction Management Oversight & Commissioning		
PCAS/LEED Certification		
Furniture, Fixtures, & Equipment		
Moving Costs		
Owner's Additional Project Costs		
Subtotal Project Cost		
Owner's Institutional Support Tax		
Total Project Cost		

Intentionally Left Blank

BUILDING 230 RENOVATION



BUILDING 230: CONSOLIDATED PROJECT SUMMARY



PROJECT SUMMARY

The Building 230 project consists of renovating the 38,366 GSF special purpose laboratory building with upgrades or replacements of its infrastructure systems, and improvements to the exterior walls and interior finishes. The planned renovation will need to be accomplished through carefully phased upgrades to limit the disturbances to the existing research programs that are not practical to relocate due to their specialized space or equipment.

Constructed in 1969, Building 230 (Fluid Mechanics) has been identified as a contributing resource to the NIST Gaithersburg Campus historic district. This free-standing facility consists of a basement and two above-grade levels and shares the light beige brick exterior and simple architectural features of the GPLs and other early laboratory buildings. The first floor is largely dedicated to laboratories and the basement to facility and infrastructure support functions with limited laboratory space. High-bay space is prevalent throughout the facility, housing multiple wind tunnels and fluid-flow experiments. The dominant large wind tunnel is located on the west end of the building. Only a small bay on the north side is used for offices on the first and second floors.

The comprehensive project is estimated to take just over six years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and three-quarters years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just under two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in, as needed, of staff and scientific equipment (F). Several of these project phases will, in reality, overlap due to the phased nature of the renovation work.

The Building 230 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

BUILDING 230: DETAILED COST

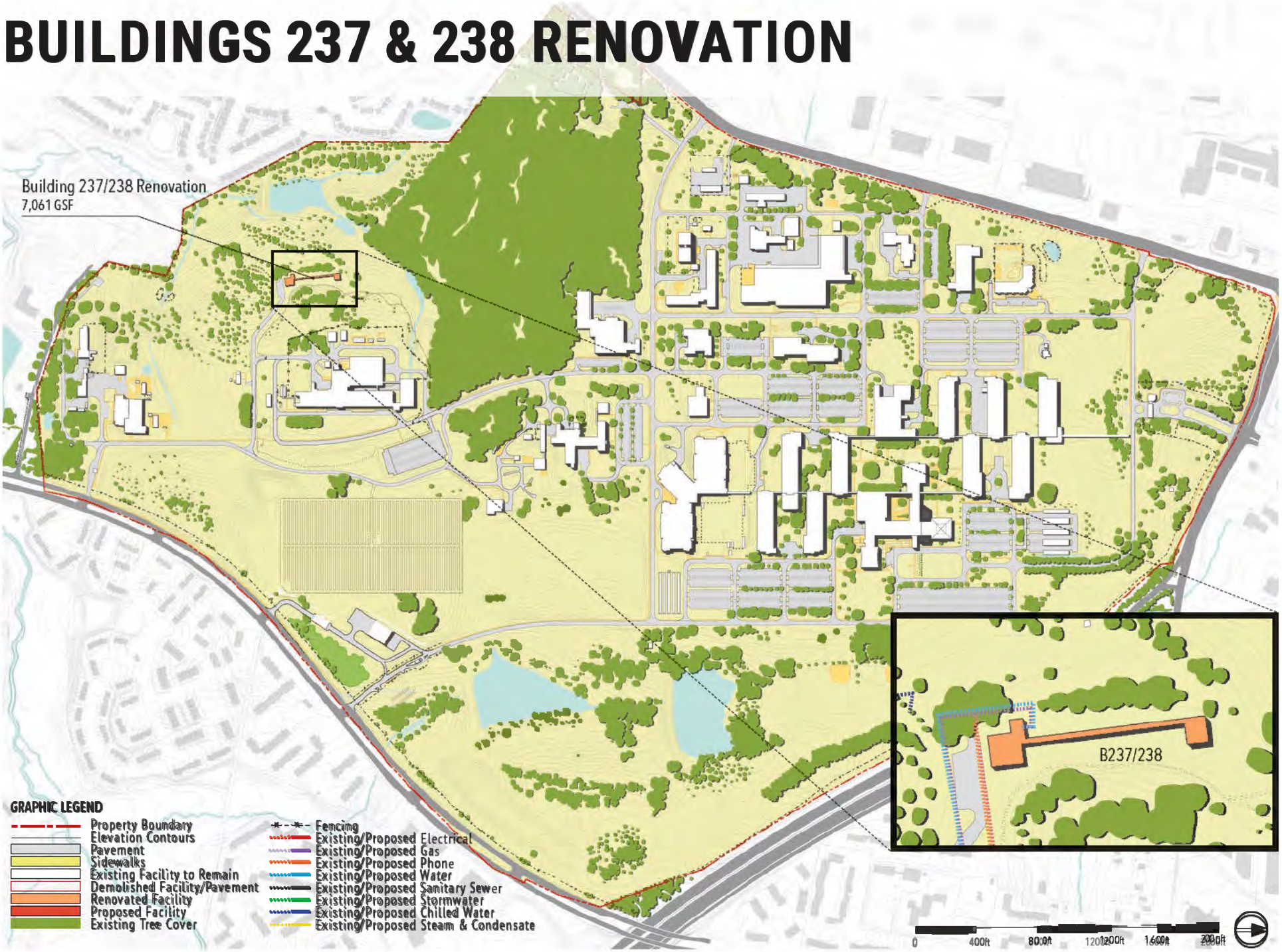
The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. The estimate assumes the building is 100% level 2 renovation with specialized laboratory building requirements. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate does not include horizontal work. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

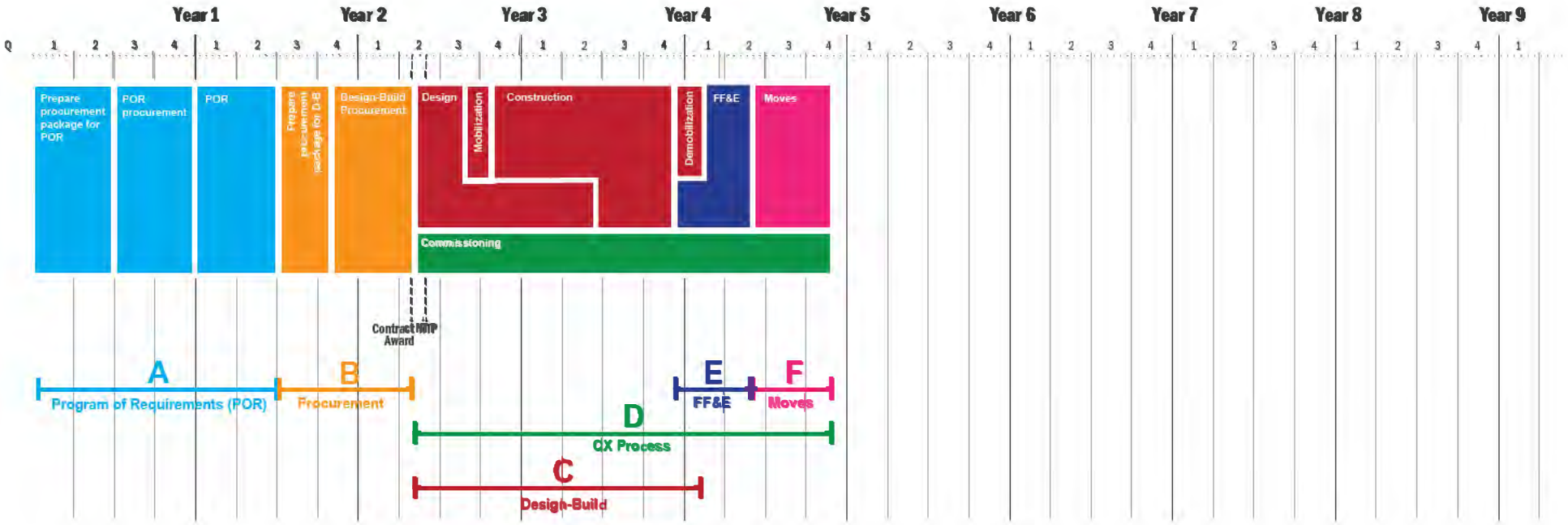
Project Cost Summary (Escalated to FY2021)
Primary Facilities
Supporting Facilities
Additional Project Costs (IT/Security)
Design Contingency
Construction Contingency
Estimated Construction Cost
Predesign
Design
Permits
Construction Management Oversight & Commissioning
PCAS/LEED Certification
Furniture, Fixtures, & Equipment
Moving Costs
Owner's Additional Project Costs
Subtotal Project Cost
Owner's Institutional Support Tax
Total Project Cost

Intentionally Left Blank

BUILDINGS 237 & 238 RENOVATION



BUILDINGS 237/238: CONSOLIDATED PROJECT SUMMARY



PROJECT SUMMARY

The Building 237/238 Renovation project consists of renovating the 3,100 GSF and 3,961 GSF special purpose laboratory buildings with upgrades or replacements of the infrastructure systems, and improvements to the exterior walls and interior finishes. The planned renovation will need to be accomplished in two phases, one building at a time.

Constructed in 1969, Buildings 237and 238 (Non-Magnetic Buildings) have been identified as a contributing resource to the NIST Gaithersburg Campus historic district. Built for very specialized research, these two buildings are adjacent structures connected with a 275' long covered walkway. Building 238 is a uniquely constructed 3-level facility of wood construction, using no magnetic materials–substitute materials, such as copper nails, have been used. Building 237 is termed a 'sister' building and is a single level administrative and laboratory space to support the research and test functions in Building 238. Building 238 has only laboratory facilities and no resident occupants. Building 237 is used for laboratory and office functions as well as electrical and mechanical infrastructure to support both facilities.

The comprehensive project is estimated to take six years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Building 237/238 project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

BUILDING 237/238: DETAILED COST

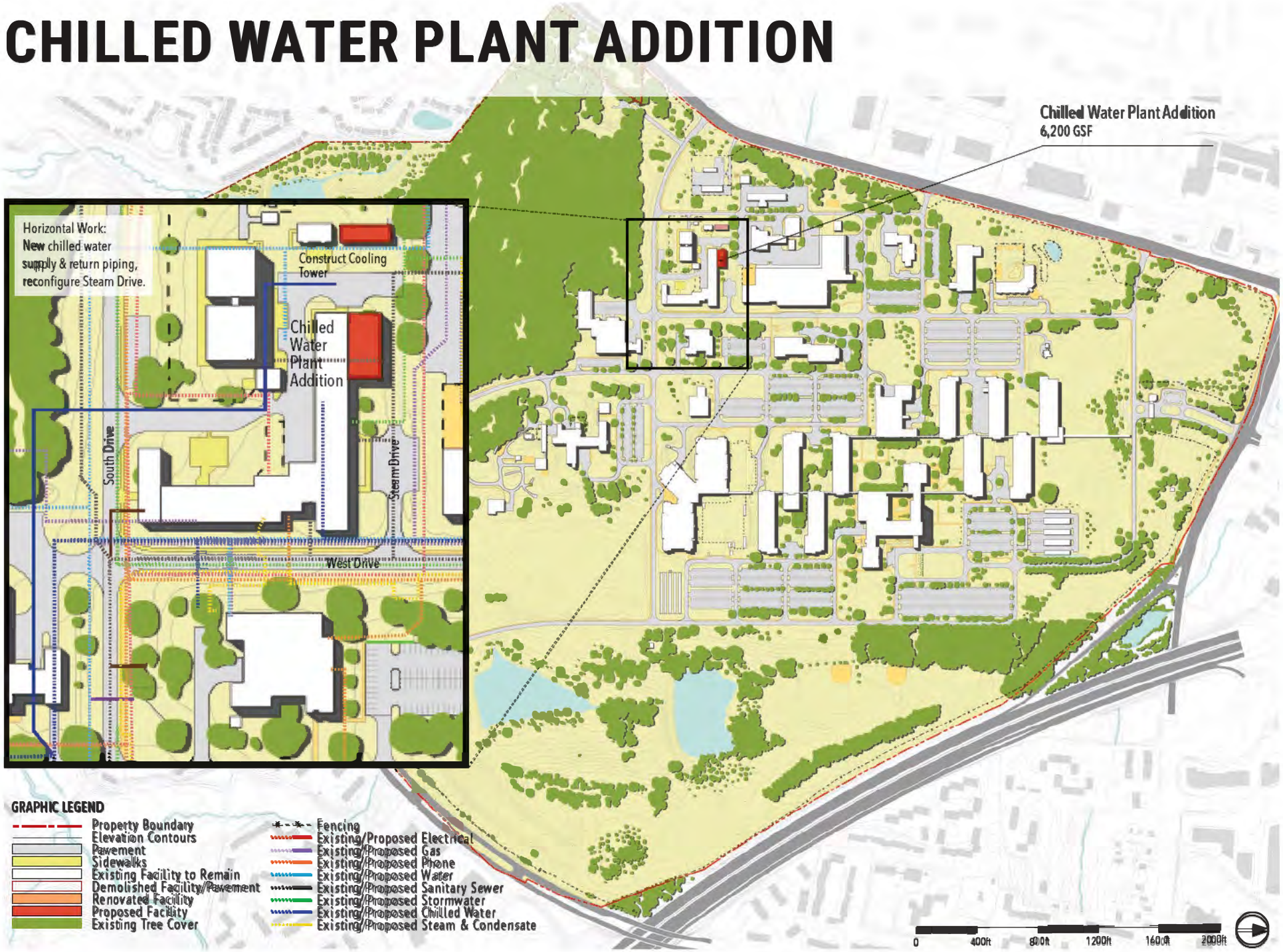
The cost estimate is calibrated to benchmarked costs for renovation of an Advanced Physical Science Research Facility as published in Laboratory Design, July/August 2015. The estimate assumes the building is 100% level 2 renovation with specialized laboratory building requirements. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate does not include horizontal work. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

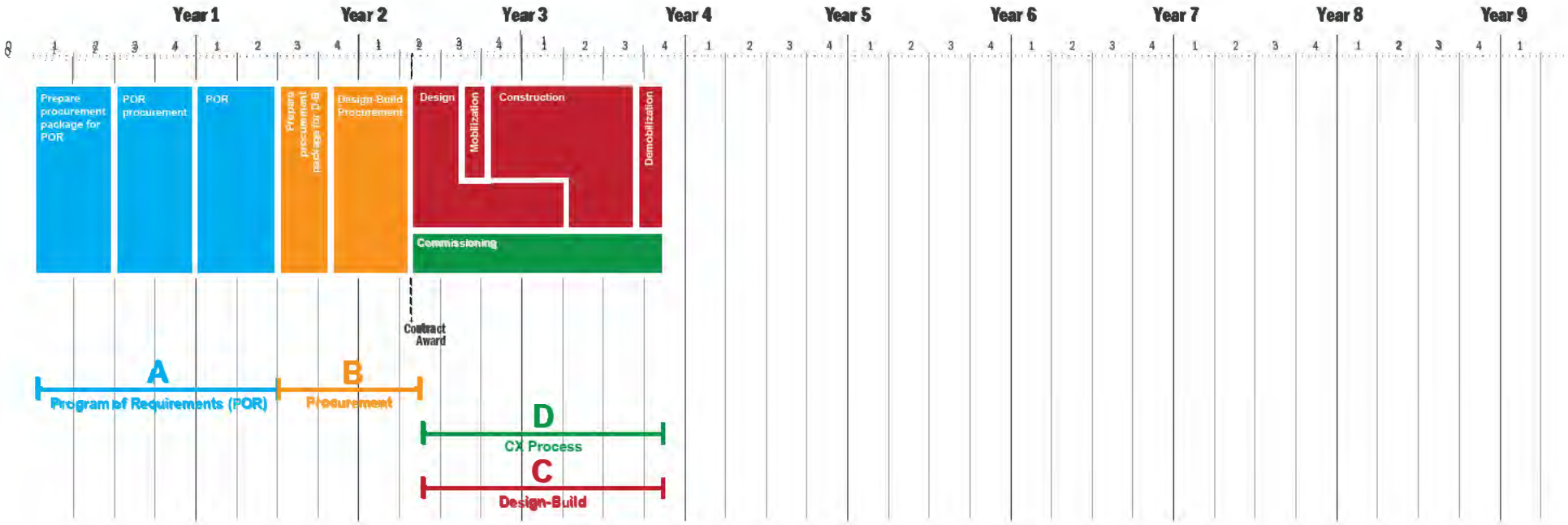
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	[redacted]
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	[redacted]
Total Project Cost	[redacted]

Intentionally Left Blank

CHILLED WATER PLANT ADDITION



CHILLED WATER PLANT ADDITION: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Chilled Water Plant Addition project includes constructing a 6,200 GSF addition to the existing Central Utility Plant, Building 302, as well as constructing a new cooling tower and 1,250 LF of chilled water supply and return piping connections, and the reconfiguration of Steam Drive. The Building 302 addition will be sized to accommodate two 3,500-ton chillers. During the same time, an additional piping main should be installed from the plant to the distribution system to increase the chilled water flow capacity out of the plant (currently limited by a single 36-inch supply main). The new cooling tower will be located to the west of the addition and next to an existing cooling tower, Building 317. Steam Drive will be modified to accommodate the building addition while maintaining service access. Built in 1961 to service the then new Campus, Building 302 has had several additions over the decades but retains sufficient architectural integrity and so was determined to be a contributing resource to the NIST Gaithersburg Campus historic district. The design and construction of the addition will follow the Secretary of the Interior's Standards for the Treatment of Historic Structures.

The Campus chilled water capacity will be closely monitored and evaluated with each major renovation and new construction project so that this project is completed and in service prior to exceeding the firm capacity of the existing chilled water system. Additionally, this project must be completed and in service prior to the completion of Research Buildings II, III, and IV.

The comprehensive project is estimated to take just under four years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at one and a half years (C). Enhanced commissioning (D) will start in design and continue through construction and equipment start-up.

The Chilled Water Plant Addition project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

CHILLED WATER PLANT ADDITION: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The project includes the construction of a new cooling tower. The estimate includes horizontal work such as new chilled water and return pipping connections. The cost for the chiller upgrade was estimated by referencing the cost of a new chiller on a university science research campus expansion (the University of Oregon's Life Sciences Campus) and another university with 2 new cooling towers. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

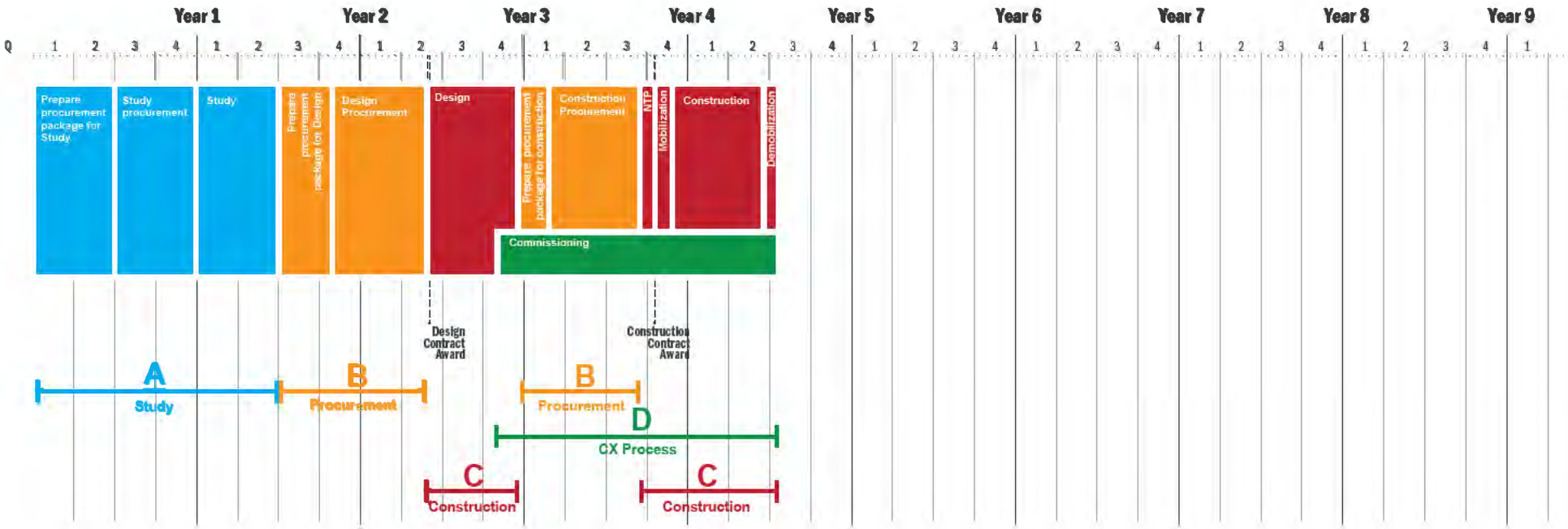
(b)(5)

Project Cost Summary (Escalated to FY2021)
Primary Facilities
Supporting Facilities
Additional Project Costs (IT/Security)
Design Contingency
Construction Contingency
Estimated Construction Cost
Predesign
Design
Permits
Construction Management Oversight & Commissioning
PCAS/LEED Certification
Furniture, Fixtures, & Equipment
Moving Costs
Owner's Additional Project Costs
Subtotal Project Cost
Owner's Institutional Support Tax
Total Project Cost

Intentionally Left Blank

NORTH CHILLED WATER LOOP

NORTH CHILLED WATER LOOP: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The North Chilled Water Loop project includes the installation of 1,215 LF of chilled water supply and return piping as well as hardscape and landscape restoration. This new chilled water main is needed in the north-west portion of the Campus to serve new Research Building I and create a loop for enhanced service reliability and redundancy to the group of five northernmost GPLs.

While this project reflects the need for the added chilled water service reliability and redundancy as shown in the Gaithersburg Campus Master Plan, it does not address the need to replace the existing aged chilled water piping that is well past it's expected useful life. NIST plans to coordinate the replacement of the existing piping with the installation of the new piping in one comprehensive project. Based on this, the piping cost estimate includes additional piping required for this project only, as replacement piping will be coordinated with the installation in a separate comprehensive project. The information shown here is purely for showing costs of the expansion portion outlined in the Master Plan.

The comprehensive project is estimated to take four and a half years. Within this schedule, key phases have been identified with a letter. Developing an Analysis & Recommendation Study (A) is estimated to take one and a half years leading to the commencement of the Design procurement package and ultimately awarding the Design contract (B). The Design phase is estimated to be six months leading to the Construction procurement phase (C). Construction is estimated to take nine months. Enhanced commissioning (D) will start in design and continue through construction.

The North Chilled Water Loop project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) If escalated to 2030 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is (b)(5) If escalated to 2027 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

NORTH CHILLED WATER LOOP: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

(b)(5)

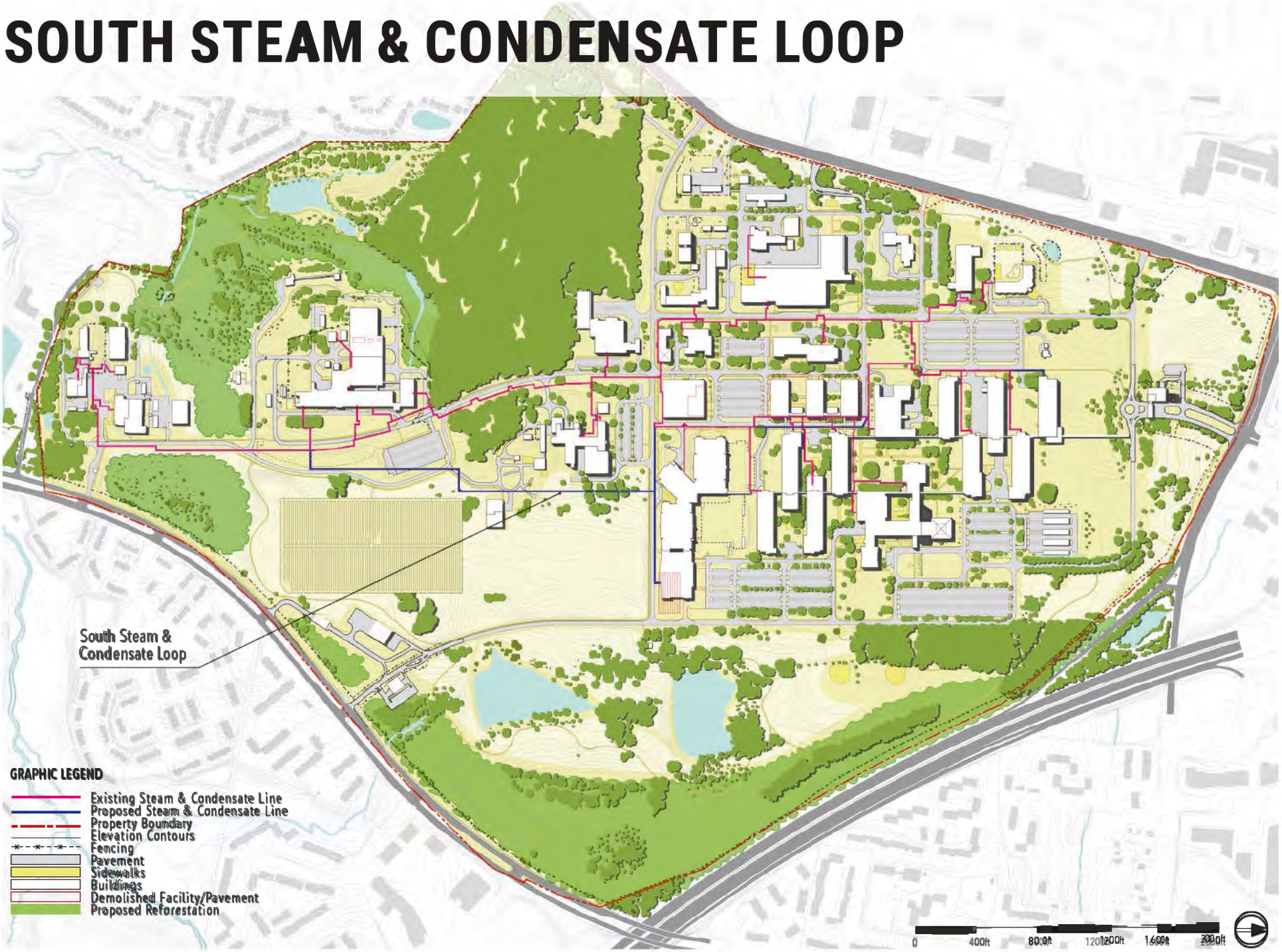
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	[redacted]
Supporting Facilities	
Additional Project Costs (IT/Security)	[redacted]
Design Contingency	[redacted]
Construction Contingency	[redacted]
Estimated Construction Cost	
Predesign	[redacted]
Design	
Permits	[redacted]
Construction Management Oversight & Commissioning	[redacted]
PCAS/LEED Certification	[redacted]
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	[redacted]
Subtotal Project Cost	[redacted]
Owner's Institutional Support Tax	[redacted]
Total Project Cost	[redacted]

FY2027 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	[redacted]
Owner's Additional Project Costs	[redacted]
Total Project Costs	[redacted]

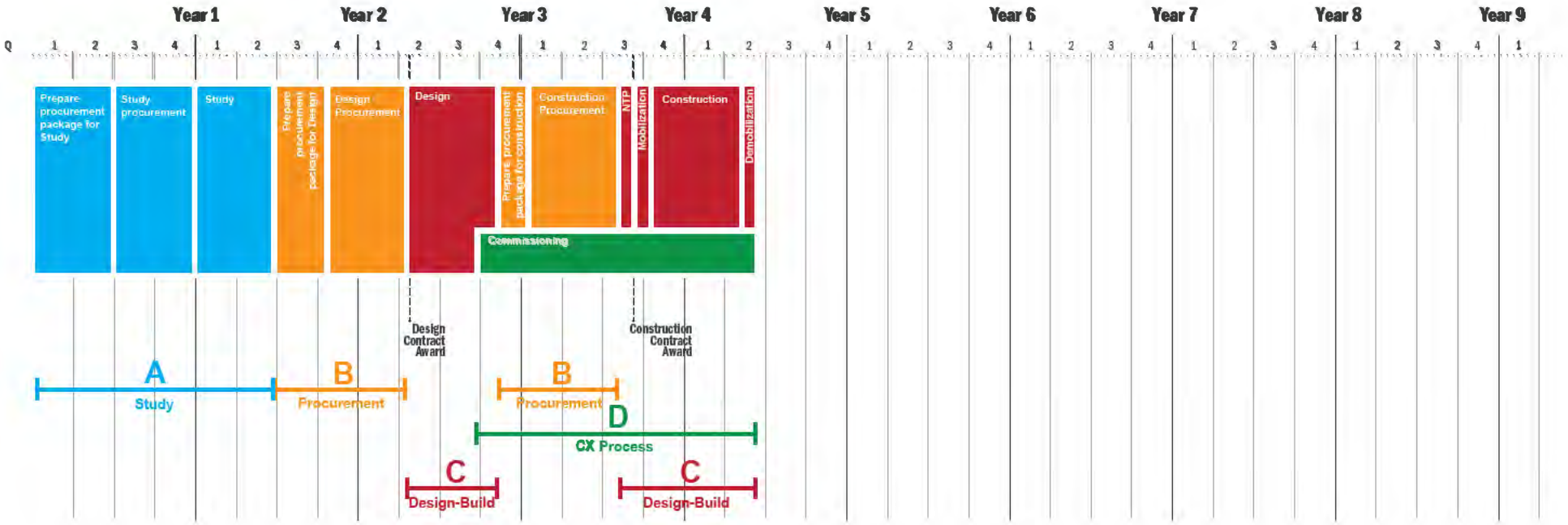
FY2030 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	[redacted]
Owner's Additional Project Costs	[redacted]
Total Project Costs	[redacted]

Intentionally Left Blank

SOUTH STEAM & CONDENSATE LOOP



SOUTH STEAM & CONDENSATE LOOP: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The South Steam and Condensate Loop project includes installation of 2,500 LF of steam and condensate piping as well as hardscape and landscape restoration. The buildings on the south portion of the Campus are served by a single main that does not provide the same level of utility availability as the north loop. A disruption or maintenance shutdown of the existing main piping results in steam supply interruptions to several of the special purpose labs. This new steam supply main is needed to create a service loop for enhanced reliability and redundancy to the south Campus buildings. The piping should be routed from South Drive along the east side of Building 245 complex and connected back to the existing main near Building 235.

While this project reflects the need for the added steam service reliability and redundancy, as shown in the Gaithersburg Campus Master Plan, it does not address the need to replace the existing steam and condensate piping throughout the Campus. NIST plans to coordinate the replacement of the existing piping with the installation of the new piping in one comprehensive project. Based on this, the piping cost estimate includes additional piping required for this project only, as replacement piping will be coordinated with the installation in a separate comprehensive project. The information shown here is purely for showing costs of the expansion portion outlined in the Master Plan.

The comprehensive project is estimated to take four and a half years. Within this schedule, key phases have been identified with a letter. Developing an Analysis & Recommendation Study (A) is estimated to take one and a half years leading to the commencement of the Design procurement package and ultimately awarding the Design contract (B). The Design phase is estimated to be six months leading to the Construction procurement phase (C). Construction is estimated to take nine months. Enhanced commissioning (D) will start in design and continue through construction.

The South Steam &Condensate Loop project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately (b)(5) . If escalated to 2029 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is (b)(5) If escalated to 2026 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is (b)(5) A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

SOUTH STEAM & CONDENSATE LOOP: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

(b)(5)

Project Cost Summary (Escalated to FY2021)	
Primary Facilities	[redacted]
Supporting Facilities	[redacted]
Additional Project Costs (IT/Security)	[redacted]
Design Contingency	[redacted]
Construction Contingency	[redacted]
Estimated Construction Cost	[redacted]
Predesign	[redacted]
Design	[redacted]
Permits	[redacted]
Construction Management Oversight & Commissioning	[redacted]
PCAS/LEED Certification	[redacted]
Furniture, Fixtures, & Equipment	[redacted]
Moving Costs	[redacted]
Owner's Additional Project Costs	[redacted]
Subtotal Project Cost	[redacted]
Owner's Institutional Support Tax	[redacted]
Total Project Cost	[redacted]

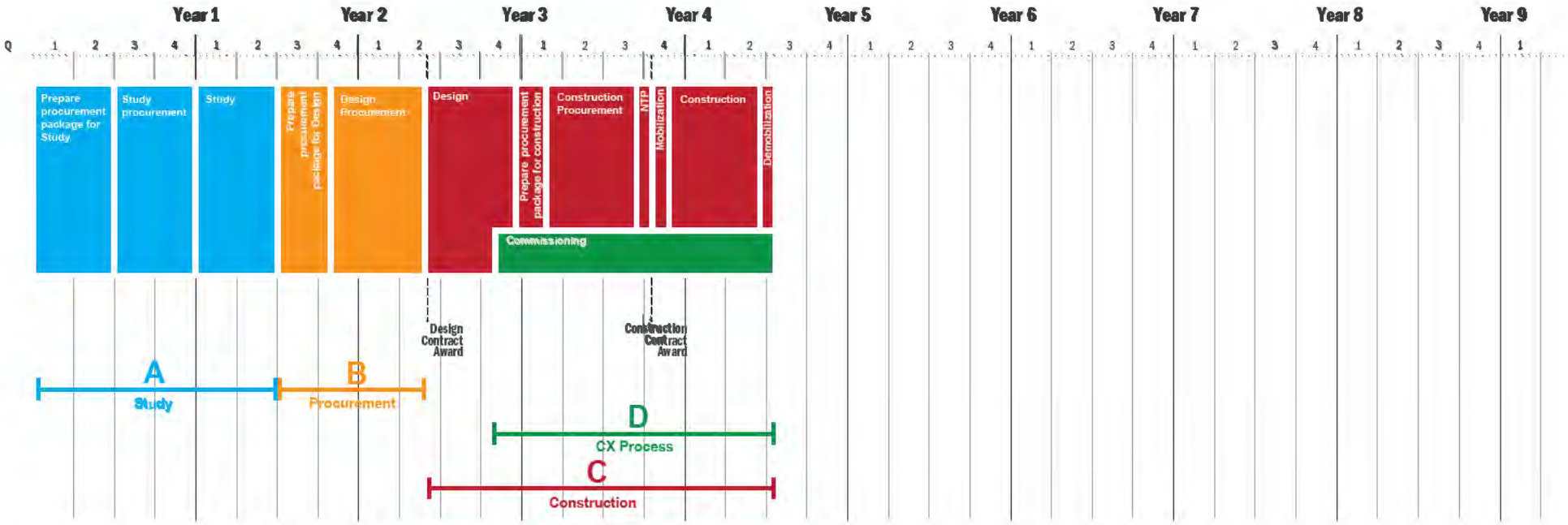
FY2026 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	[redacted]
Owner's Additional Project Costs	[redacted]
Total Project Costs	[redacted]

FY2029 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	[redacted]
Owner's Additional Project Costs	[redacted]
Total Project Costs	[redacted]

Intentionally Left Blank

SOUTH CHILLED WATER LOOP

SOUTH CHILLED WATER LOOP: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The South Chilled Water Loop project includes installation of 2,500 LF of chilled water supply and return piping as well as hardscape and landscape restoration. The buildings on the south portion of the Campus are served by a single main that does not provide the same level of utility availability as the north loop. A disruption or maintenance shutdown of the existing main piping results in chilled water supply interruptions to several of the special purpose labs. This project creates a loop configuration to provide enhanced service reliability and redundancy to the south Campus buildings. The piping should be routed from South Drive along the east side of Building 245 complex and connected back to the existing main near Building 235.

While this project reflects the need for the added chilled water service reliability and redundancy as shown in the Gaithersburg Campus Master Plan, it does not address the need to replace the existing aged chilled water piping that is well past it's expected useful life. NIST plans to coordinate the replacement of the existing piping with the installation of the new piping in one comprehensive project. Based on this, the piping cost estimate includes additional piping required for this project only, as replacement piping will be coordinated with the installation in a separate comprehensive project. The information shown here is purely for showing costs of the expansion portion outlined in the Master Plan.

The comprehensive project is estimated to take four and a half years. Within this schedule, key phases have been identified with a letter. Developing an Analysis & Recommendation Study (A) is estimated to take one and a half years leading to the commencement of the Design procurement package and ultimately awarding the Design contract (B). The Design phase is estimated to be six months leading to the Construction procurement phase (C). Construction is estimated to take nine months. Enhanced commissioning (D) will start in design and continue through construction.

The South Chilled Water Loop project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2028 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted] If escalated to 2026 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

(b)(5)

SOUTH CHILLED WATER LOOP: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

(b)(5)

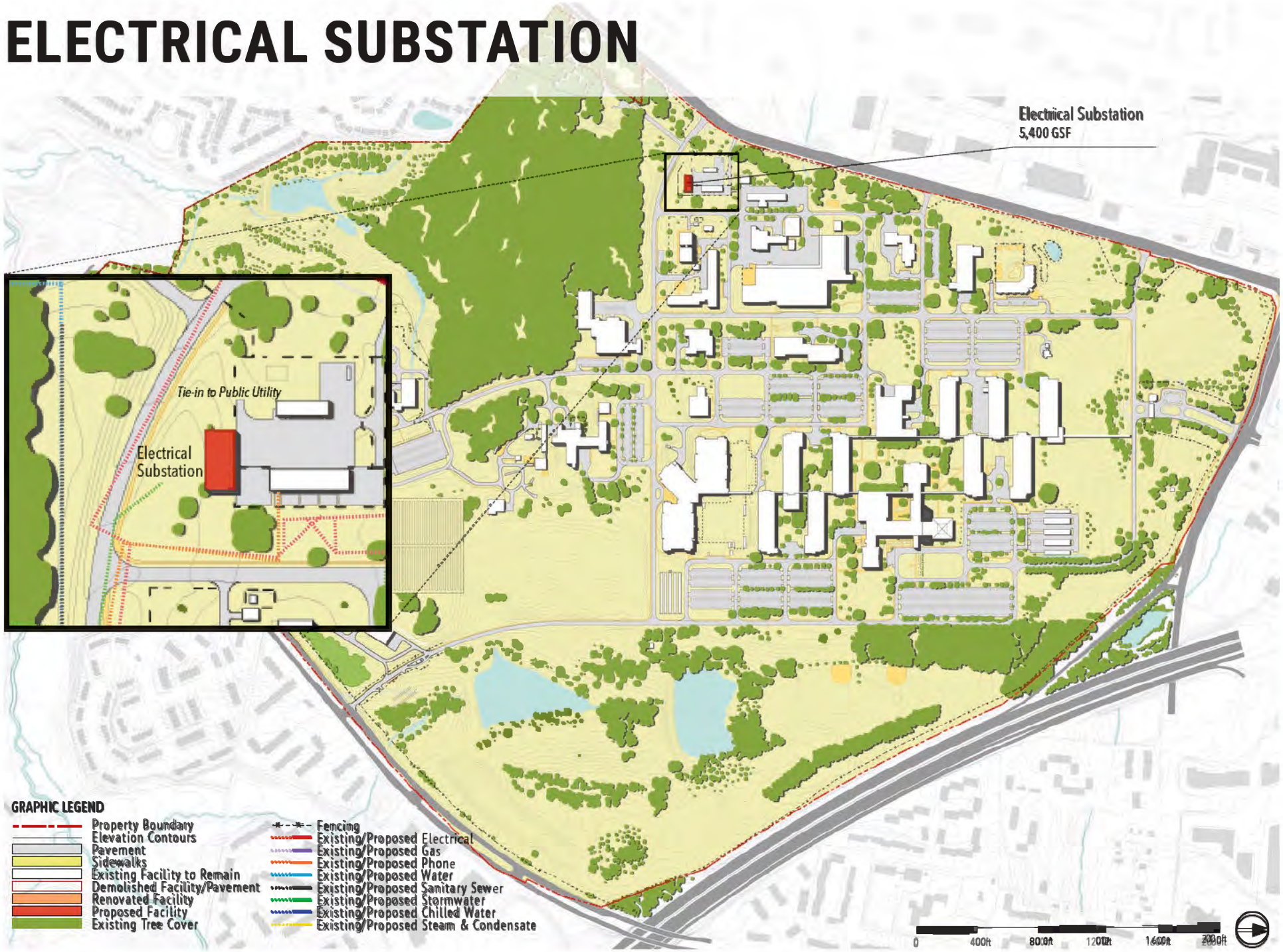
Project Cost Summary (Escalated to FY2021)		
Primary Facilities		
Supporting Facilities		
Additional Project Costs (IT/Security)		
Design Contingency		
Construction Contingency		
Estimated Construction Cost		
Predesign		
Design		
Permits		
Construction Management Oversight & Commissioning		
PCAS/LEED Certification		
Furniture, Fixtures, & Equipment		
Moving Costs		
Owner's Additional Project Costs		
Subtotal Project Cost		
Owner's Institutional Support Tax		
Total Project Cost		

FY2026 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

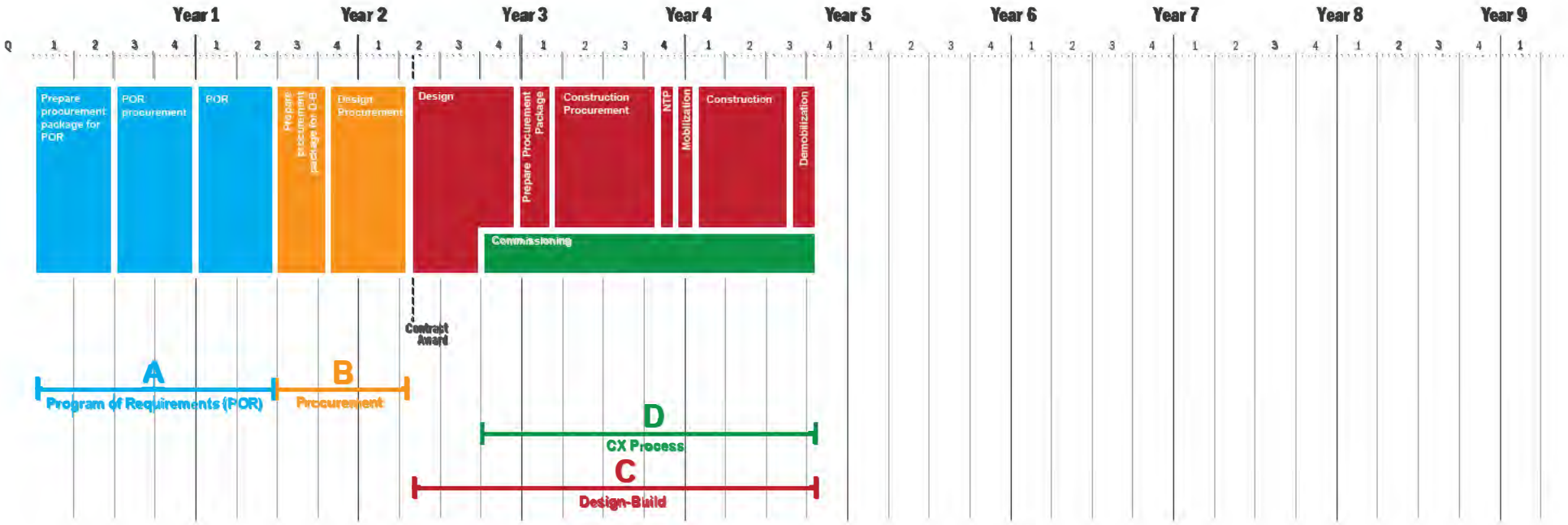
FY2028 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

Intentionally Left Blank

ELECTRICAL SUBSTATION



ELECTRICAL SUBSTATION: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Electrical Substation project consists of constructing a new 5,400 GSF electrical switching station building. The existing primary electrical switchgear/sub-station will exceed its firm capacity before all projects are constructed. While upgrades to the existing switching station are planned early on, they will not account for the increased demand as Research Buildings II, III, and IV are constructed. Additionally, the 60-year old electrical duct bank system has partially collapsed and is partly glued up by old cable lubricant and needs to be replaced. New electrical feeders in new duct banks are required and could connect directly to the new Electrical Substation, providing NIST with improved flexibility.

The comprehensive project is estimated to take just under five years. Within this schedule, key phases have been identified with a letter. Developing an Analysis & Recommendation Study (A) is estimated to take one and a half years leading to the commencement of the Design procurement package and ultimately awarding the Design contract (B). The Design phase is estimated to be nine months leading to the Construction procurement phase (C). Construction is estimated to take one year. Enhanced commissioning (D) will start in design and continue through construction.

The Electrical Substation project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. If escalated to 2036 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted]. If escalated to 2031 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

(b)(5)

ELECTRICAL SUBSTATION: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. This project includes tie-in to the public utility. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

(b)(5)

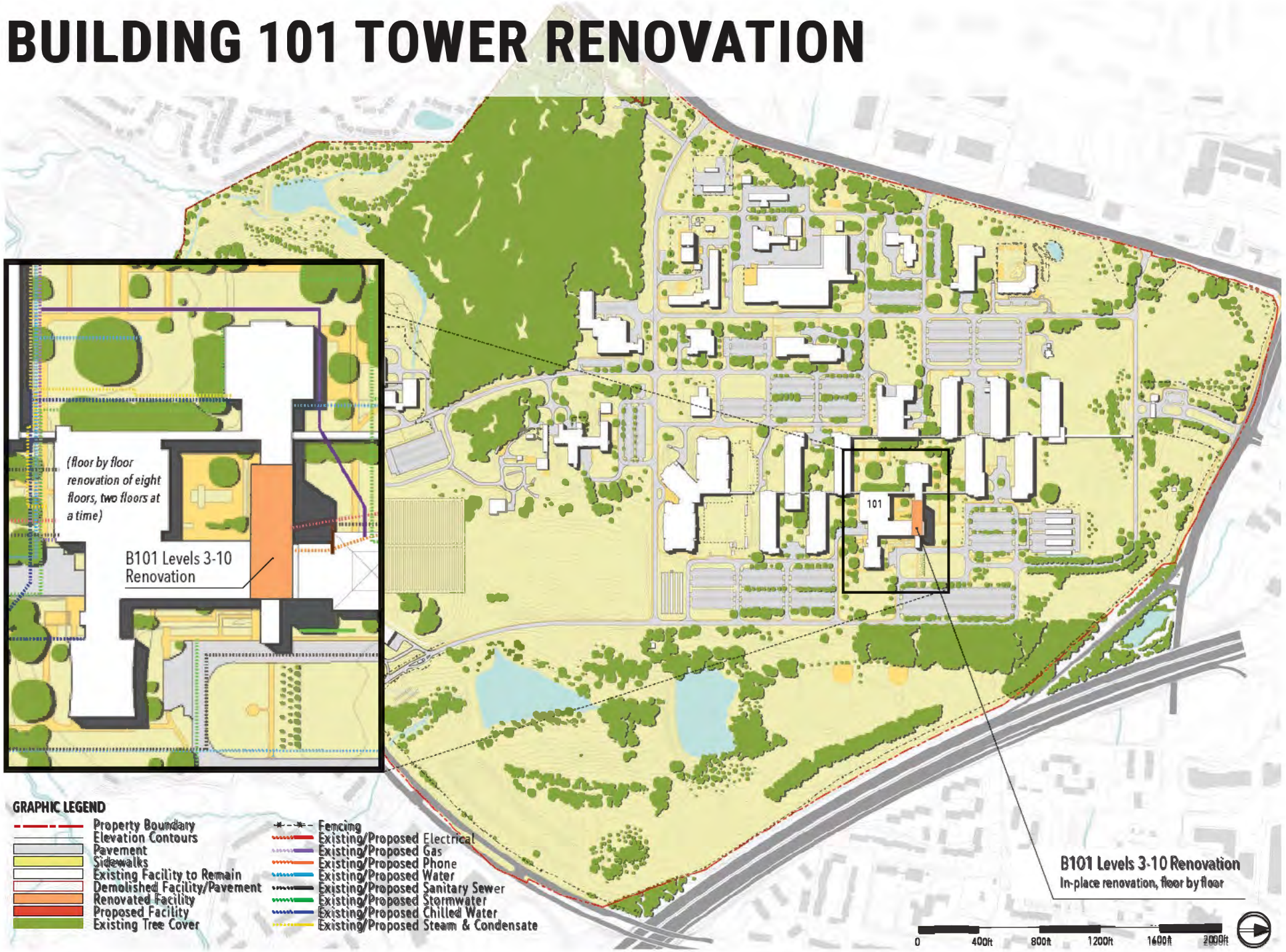
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

FY2031 ($7M Annual Appropriation Schedule)
Estimated Construction Cost
Owner's Additional Project Costs
Total Project Costs

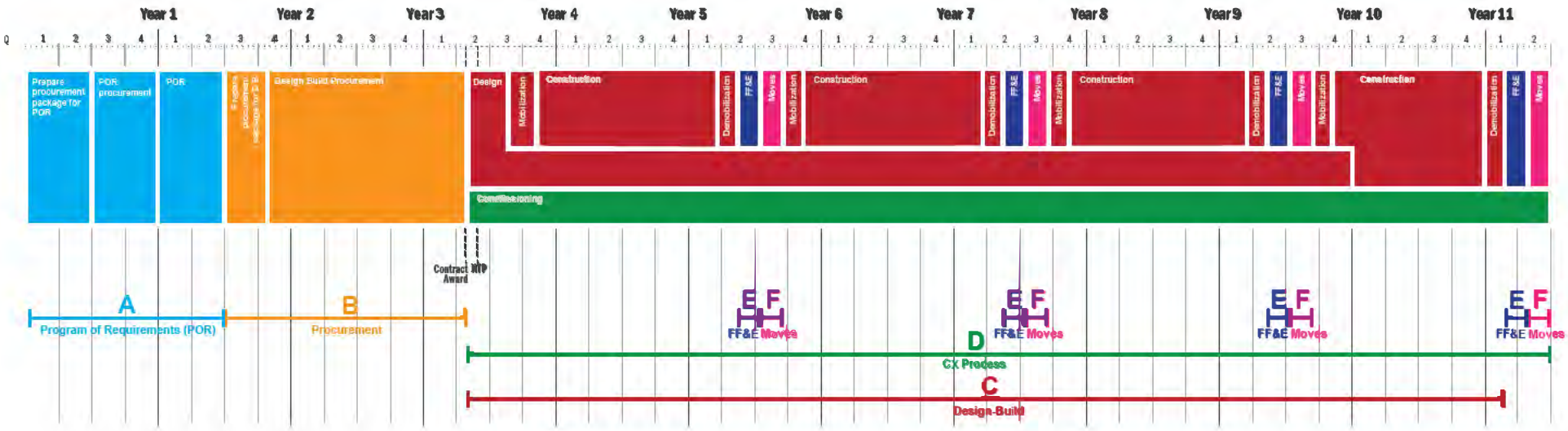
FY2036 ($5M Annual Appropriation Schedule)
Estimated Construction Cost
Owner's Additional Project Costs
Total Project Costs

Intentionally Left Blank

BUILDING 101 TOWER RENOVATION



BUILDING 101 TOWER RENOVATION: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Building 101 Tower Renovation project consists of renovating approximately 10,317 GSF/floor for floors 3-10 of the 11-story office tower. Each floor will be renovated for improved utilization efficiencies to include contemporary office environments with open workstations, collaboration areas, meeting rooms, and limited enclosed offices. The restrooms will be fully renovated to comply with accessibility requirements. The renovations are planned to be accomplished on a floor by floor basis, under one Design-Build contract, as occupants are temporarily moved into swing space.

Commissioned in 1965, Administration Building 101 is a key contributing resource to the NIST Gaithersburg Campus Historic District. significant character defining features have been identified inside and out in a comprehensive building materials condition survey and historic structures report completed in March 2020. Constructed as the headquarters building for the National Bureau of Standards (now NIST) with executive and administrative offices, the building continues to serve that function and remains the largest office building on the Gaithersburg Campus. It is the iconic heart of the Campus and the primary visual landmark and destination. Building 101 is centrally located and connects to the system of pedestrian concourses that provide sheltered access to many of the laboratory buildings on Campus. Like many campus facilities, the core architecture and infrastructure of the building has generally remained unchanged from the original construction.

The comprehensive project is estimated to take approximately eleven and a half years, dependent upon renovating two floors at a time. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase will consist of multiple stages and is estimated at eight years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy for each phase. Installation of FF&E (E) and then the move-in of staff will complete each phase (F).

The Building 101 Tower Renovation project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2028 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted] If escalated to 2025 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

(b)(5)

BUILDING 101 TOWER RENOVATION: DETAILED COST

The estimate assumes the building is 100% level 2 renovation. A description of the levels of renovation can be found in the Appendix: Detailed Cost Estimates. The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate does not include horizontal work. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

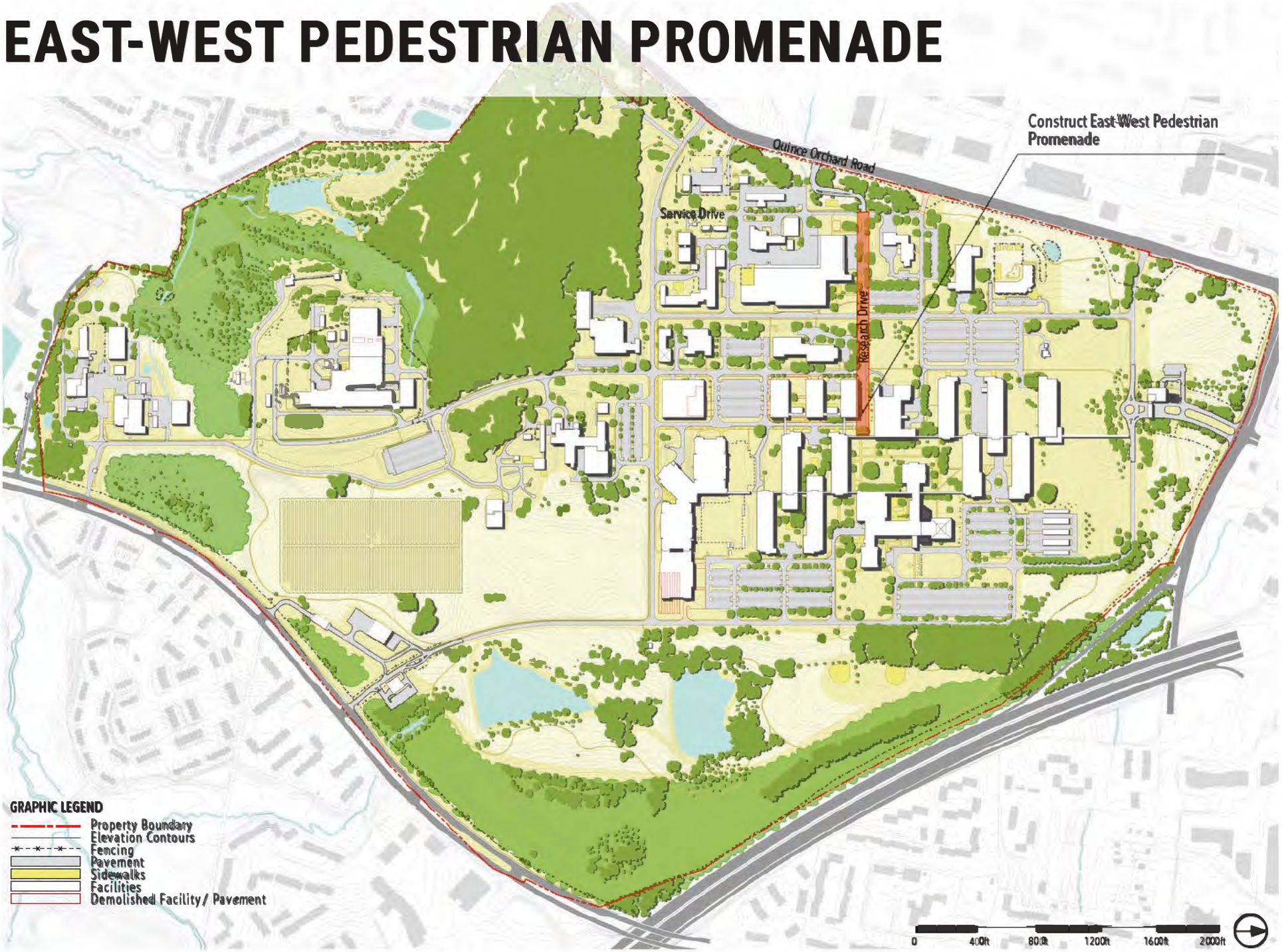
Project Cost Summary (Escalated to FY2021)
Primary Facilities
Supporting Facilities
Additional Project Costs (IT/Security)
Design Contingency
Construction Contingency
Estimated Construction Cost
Predesign
Design
Permits
Construction Management Oversight & Commissioning
PCAS/LEED Certification
Furniture, Fixtures, & Equipment
Moving Costs
Owner's Additional Project Costs
Subtotal Project Cost
Owner's Institutional Support Tax
Total Project Cost

FY2025 ($7M Annual Appropriation Schedule)
Estimated Construction Cost
Owner's Additional Project Costs
Total Project Costs

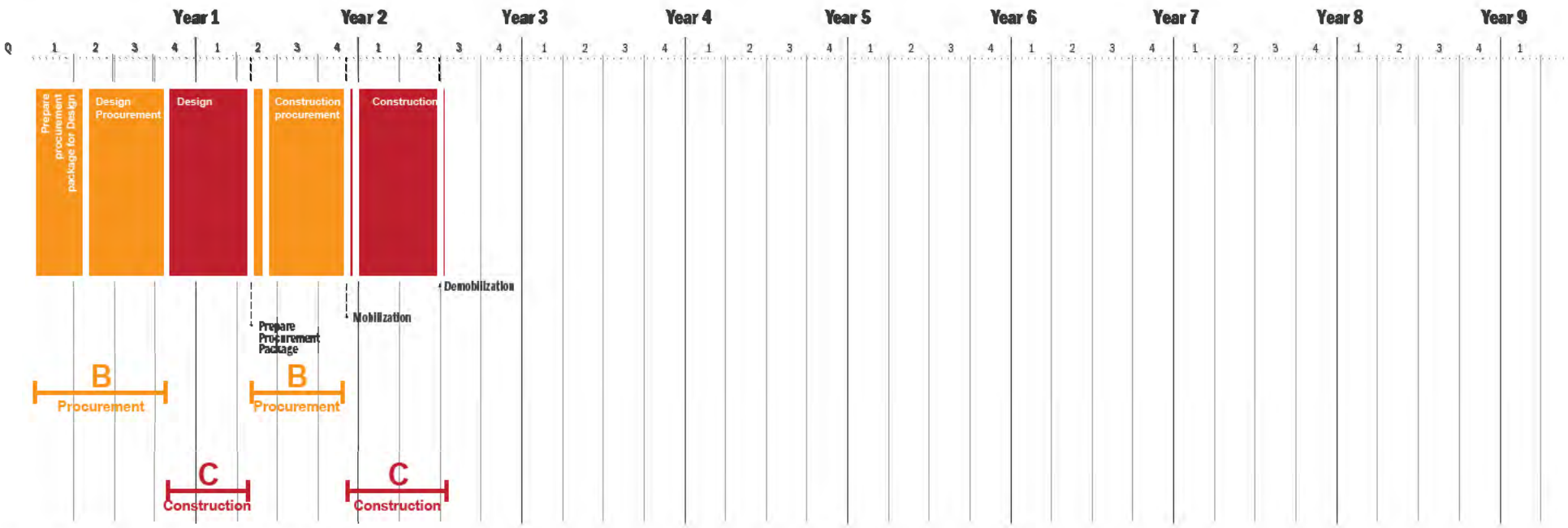
FY2028 ($5M Annual Appropriation Schedule)
Estimated Construction Cost
Owner's Additional Project Costs
Total Project Costs

Intentionally Left Blank

EAST-WEST PEDESTRIAN PROMENADE



EAST-WEST PEDESTRIAN PROMENADE: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The East-West Pedestrian Promenade project includes 50,000 SF of sidewalk as well as landscaping, lighting, and demolition of existing paving. According to the Gaithersburg Master Plan, this project transitions existing sidewalks and roads from Building 101 and Building 223 west between Research Building II and Building 304, and further west toward Quince Orchard Road along Research Drive to Service Drive, into a pedestrian-only walkway. It will provide a much-needed enhanced pedestrian connection from the center of the Campus at Building 101 to Building 301, a significant support and office facility, and then to the future Corridor Cities Transitway NIST station. The project will feature large-scale plank pavers, low seat walls, pedestrian lighting, intermittent planters and native landscaping. It will also tie into a planned outdoor dining terrace on the north side of Building 301.

The comprehensive project is estimated to take approximately two and a half years. Within this schedule, key phases have been identified with a letter. The project begins with the Design procurement package and ultimately awarding the Design contract (B). The Design phase is estimated to be six months leading to the Construction procurement phase (C). Construction is estimated to take six months.

The East-West Pedestrian Promenade project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2039 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted] If escalated to 2033 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted]

A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

(b)(5)

EAST-WEST PEDESTRIAN PROMENADE: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

(b)(5)

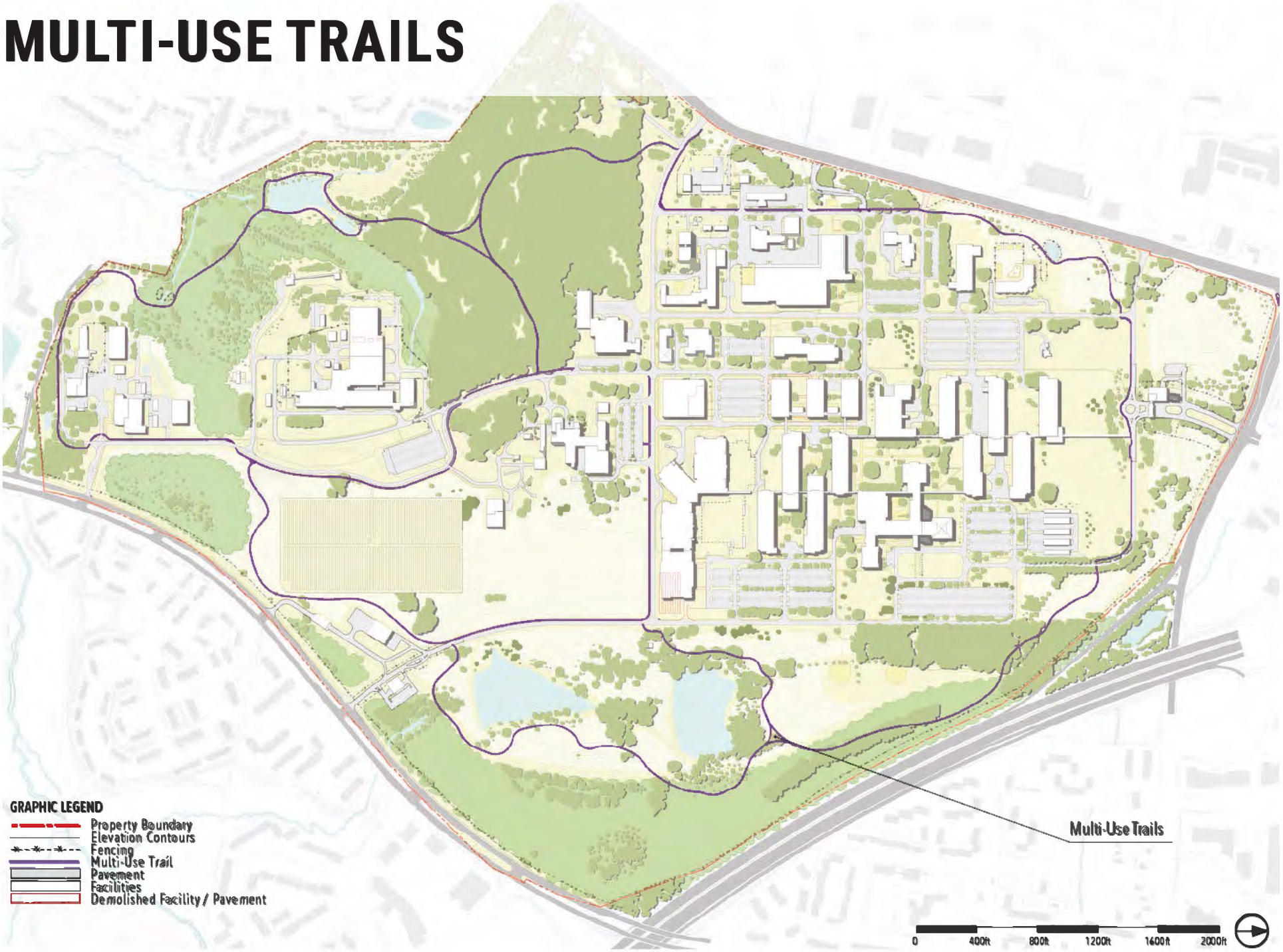
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

FY2033 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

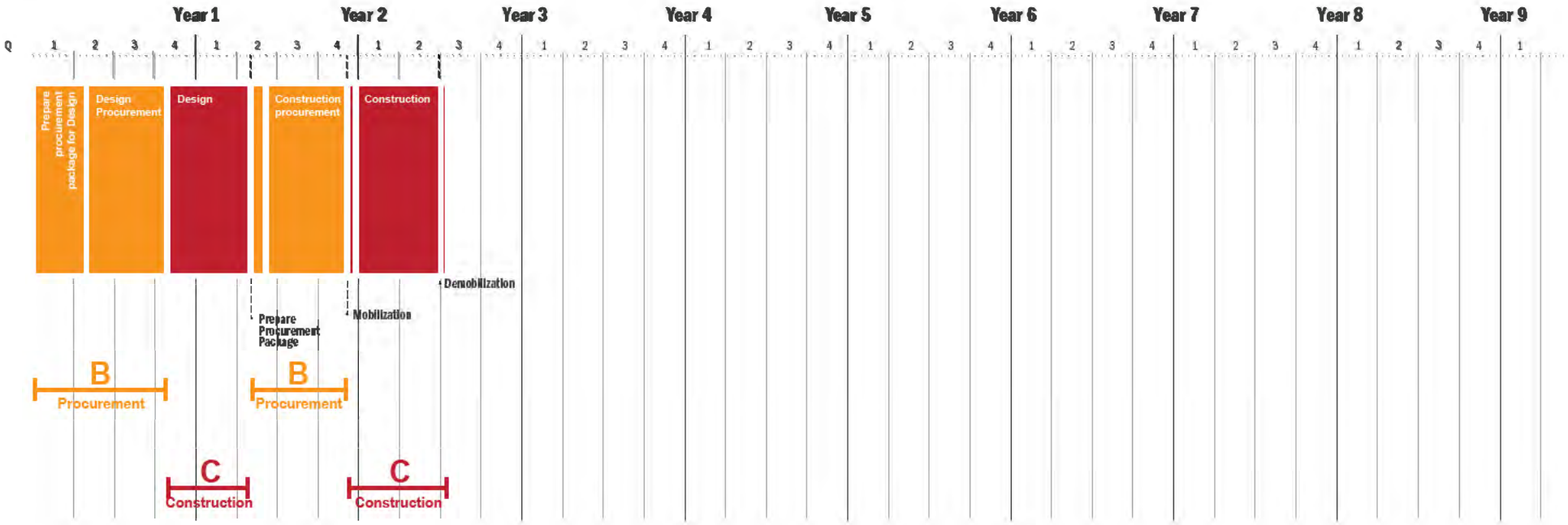
FY2039 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

Intentionally Left Blank

MULTI-USE TRAILS



MULTI-USE TRAILS: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Multi-Use Trails project includes the installation of 175,000 SF of trails that will be accomplished through a combination of soft and paved surfaces, as well as landscaping and seeding. According to the Gaithersburg Master Plan, this project is a quality of life improvement for NIST employees as it will allow employees access to the full 579-acre Campus for walking and recreation.

The proposed walking trails can be implemented gradually, in segments. However, if constructed at one time, the comprehensive project is estimated to take approximately two and a half years. Within this schedule, key phases have been identified with a letter. The project begins with the Design procurement package and ultimately awarding the Design contract (B). The Design phase is estimated to be six months leading to the Construction procurement phase (C). Construction is estimated to take six months.

The Multi-Use Trails project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2037 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted]. If escalated to 2032 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

(b)(5)

MULTI-USE TRAILS: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

(b)(5)

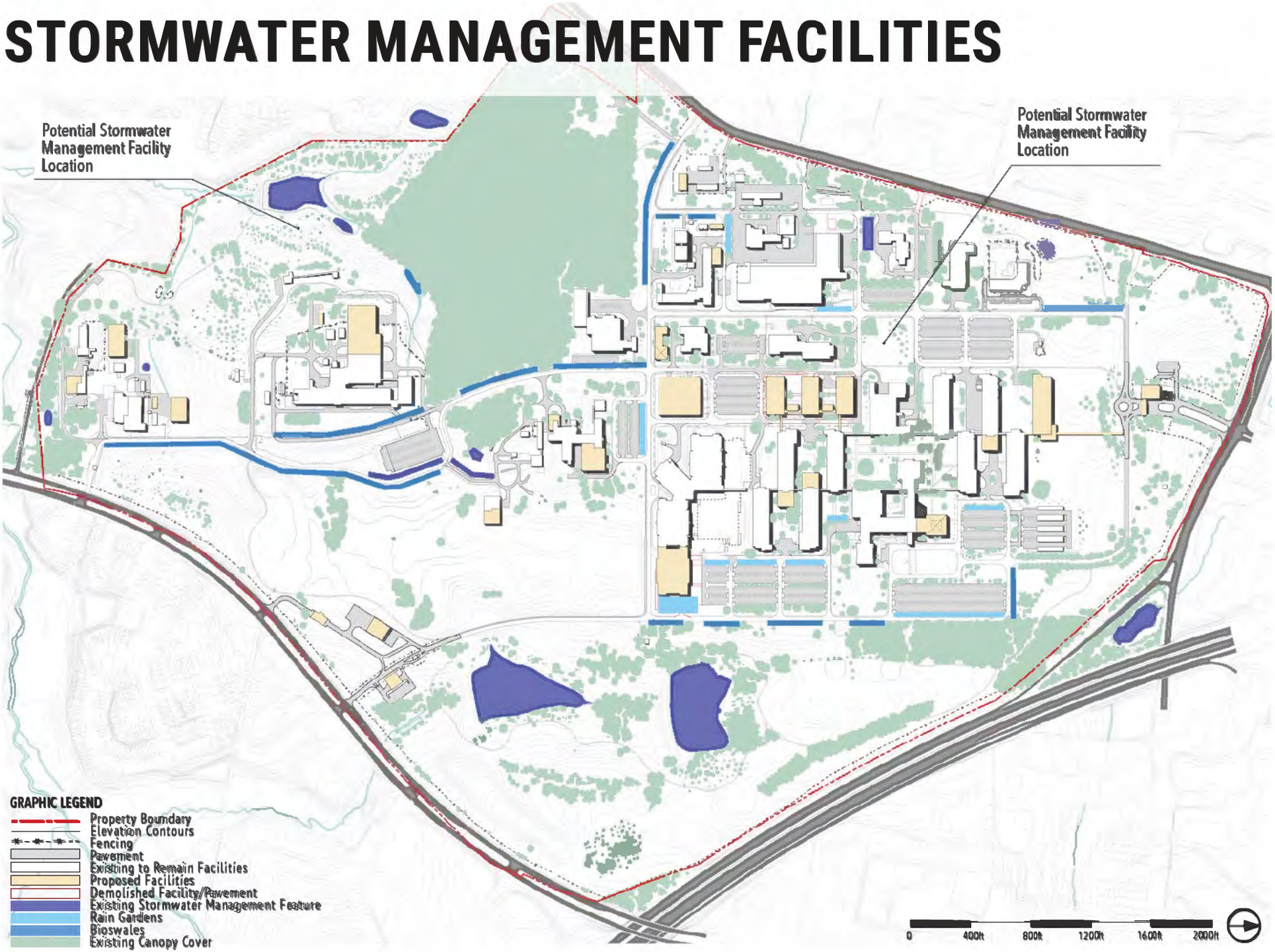
Project Cost Summary (Escalated to FY2021)		
Primary Facilities		
Supporting Facilities		
Additional Project Costs (IT/Security)		
Design Contingency		
Construction Contingency		
Estimated Construction Cost		
Predesign		
Design		
Permits		
Construction Management Oversight & Commissioning		
PCAS/LEED Certification		
Furniture, Fixtures, & Equipment		
Moving Costs		
Owner's Additional Project Costs		
Subtotal Project Cost		
Owner's Institutional Support Tax		
Total Project Cost		

FY2032 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

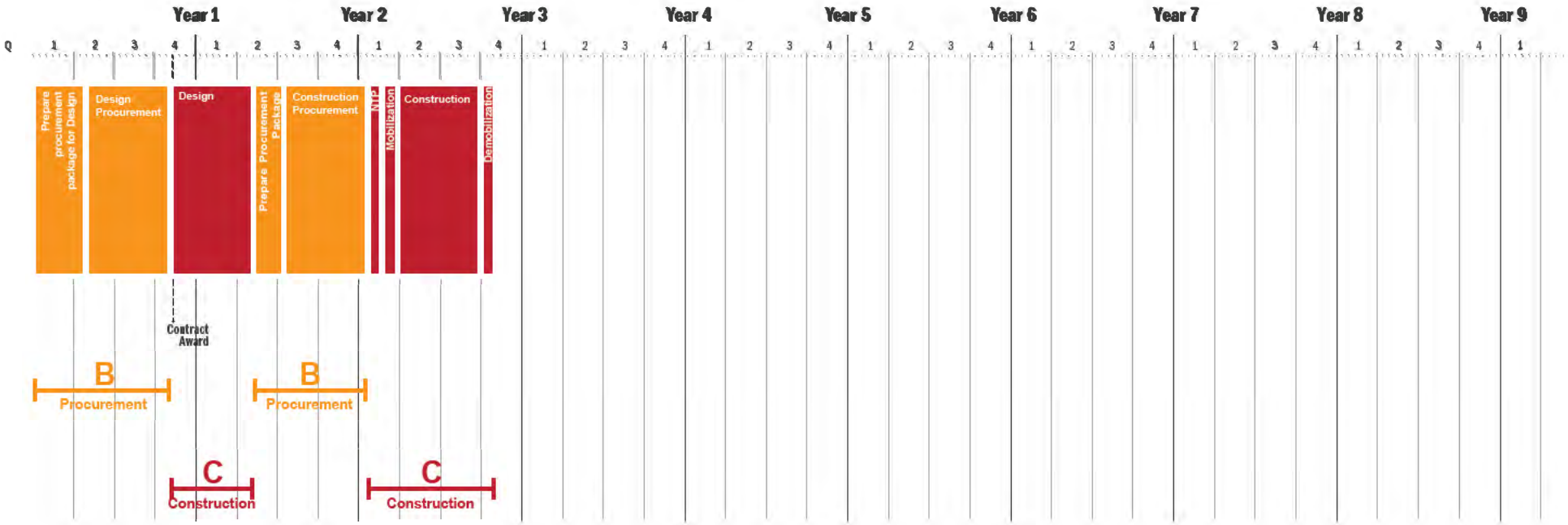
FY2037 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

Intentionally Left Blank

STORMWATER MANAGEMENT FACILITIES



STORMWATER MANAGEMENT FACILITIES: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Stormwater Management Facilities project includes 45,302 SF of infiltration swale, seeded lawn, landscaping, and excavation and fill. The stormwater management strategies laid out in the Gaithersburg Campus Master Plan emphasize natural features such as bioswales, rain gardens, and extensive reforestation. NIST is required to treat 20% (17 acres) of runoff from existing impervious surfaces, in accordance with its recently renewed Maryland Storm Water Permit. The Stormwater Management Facilities are needed for compliance. As the Campus expands, NIST will also need to meet current stormwater management requirements for treating the increased impervious surface area. There are many simple interventions within the landscape that can slow run-off. In this plan, interventions include removing curbs and creating bioswales, retrofitting parking lots to include small rain gardens, possible building green roof systems, and reforestation.

The stormwater management facilities can be implemented in segments. However, if constructed at one time, the comprehensive project is estimated to take just under three years. Within this schedule, key phases have been identified with a letter. The project begins with the Design procurement package and ultimately awarding the Design contract (B). The Design phase is estimated to be six months leading to the Construction procurement phase (C). Construction is estimated to take six months.

The Stormwater Management Facilities project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2022 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted] If escalated to 2021 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

(b)(5)

STORMWATER MANAGEMENT FACILITIES: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. This project does not include stormwater facilities directly related to facility projects but rather captures the additional stormwater management facilities needed for low impact development such as grassy bio-swales along the roadways and rain gardens. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule.

Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no predesign costs, FF&E costs or moving costs incorporated into this estimate.

(b)(5)

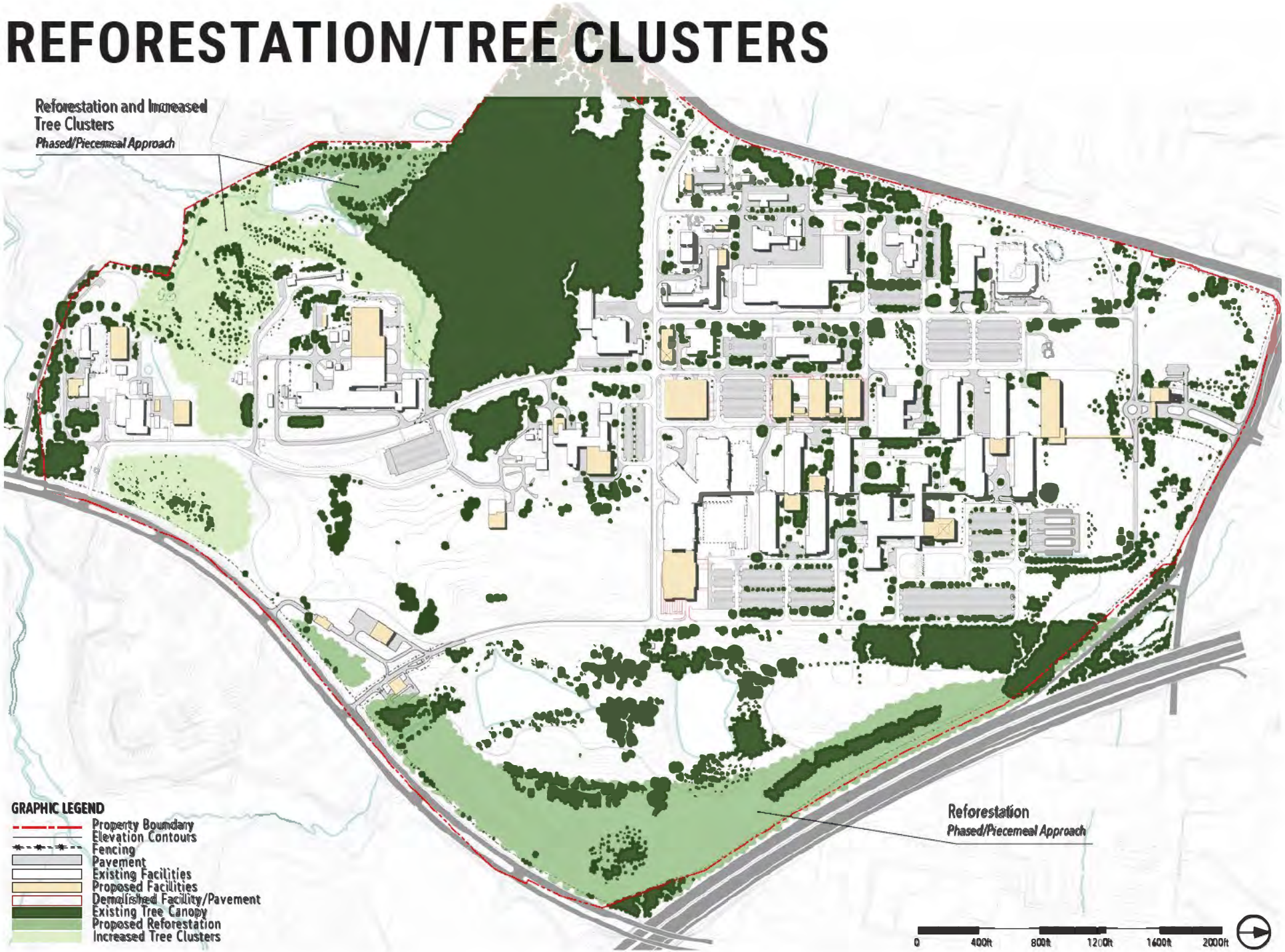
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

FY2021 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

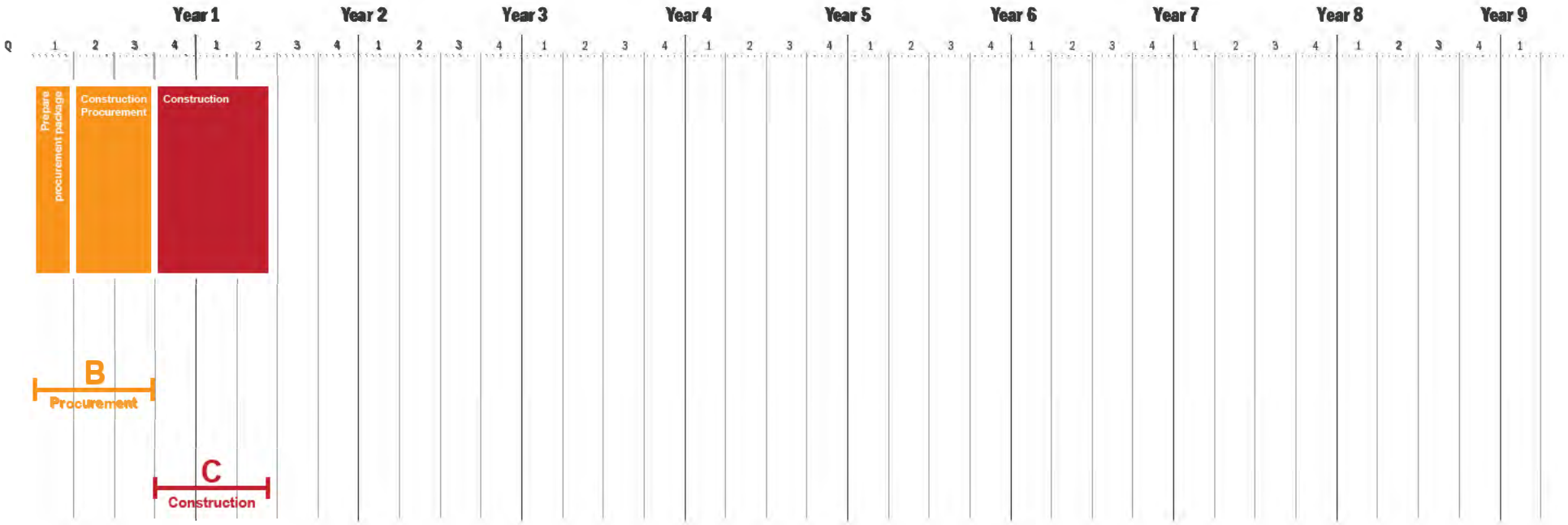
FY2022 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

Intentionally Left Blank

REFORESTATION/TREE CLUSTERS



REFORESTATION/TREE CLUSTERS: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Reforestation project consists of planting 34 acres with a variety of native trees to create densely forested areas. This goal will require approximately 5,100 newly planted trees. The Campus currently has two prominent forested areas; one flanking the eastern border of Interstate 270, and another large section central on the wester edge of the property boundary. The reforestation will continue the ongoing efforts along the eastern side of the site and extend the western forest to the south. Extending the tree canopy will provide many assets, including noise and sight barriers, increased biodiversity, earth stabilization, aesthetic appeal and the mitigation of vast expanses of existing mowed grass. Additionally, this reforestation project is critical for NIST's compliance with its Maryland Stormwater Permit as it will provide a credit of approximately 13 acres towards the 17 acres that are required to be treated for stormwater runoff. Smaller, focused tree clusters are also proposed in the south end of the Campus, building off of existing planting patterns and providing many of the same benefits as the dense reforestation.

The comprehensive project is estimated to take one and a half years. This project begins with the construction procurement phase resulting in the award of the construction contract. The construction phase is estimated to be nine months.

The Reforestation project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. If escalated to 2023 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted]. If escalated to 2022 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

(b)(5)

REFORESTATION/TREE CLUSTERS: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. There are no FF&E or moves incorporated into this estimate.

(b)(5)

Project Cost Summary (Escalated to FY2021)		
Primary Facilities		
Supporting Facilities		
Additional Project Costs (IT/Security)	[redacted]	[redacted]
Design Contingency	[redacted]	[redacted]
Construction Contingency		
Estimated Construction Cost		
Predesign	[redacted]	[redacted]
Design	[redacted]	[redacted]
Permits	[redacted]	[redacted]
Construction Management Oversight & Commissioning	[redacted]	[redacted]
PCAS/LEED Certification	[redacted]	[redacted]
Furniture, Fixtures, & Equipment		
Moving Costs		
Owner's Additional Project Costs		[redacted]
Subtotal Project Cost		[redacted]
Owner's Institutional Support Tax		[redacted]
Total Project Cost		[redacted]

FY2022 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	[redacted]
Owner's Additional Project Costs	[redacted]
Total Project Costs	**$1,405,271**

FY2023 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	[redacted]
Owner's Additional Project Costs	[redacted]
Total Project Costs	[redacted]

Intentionally Left Blank

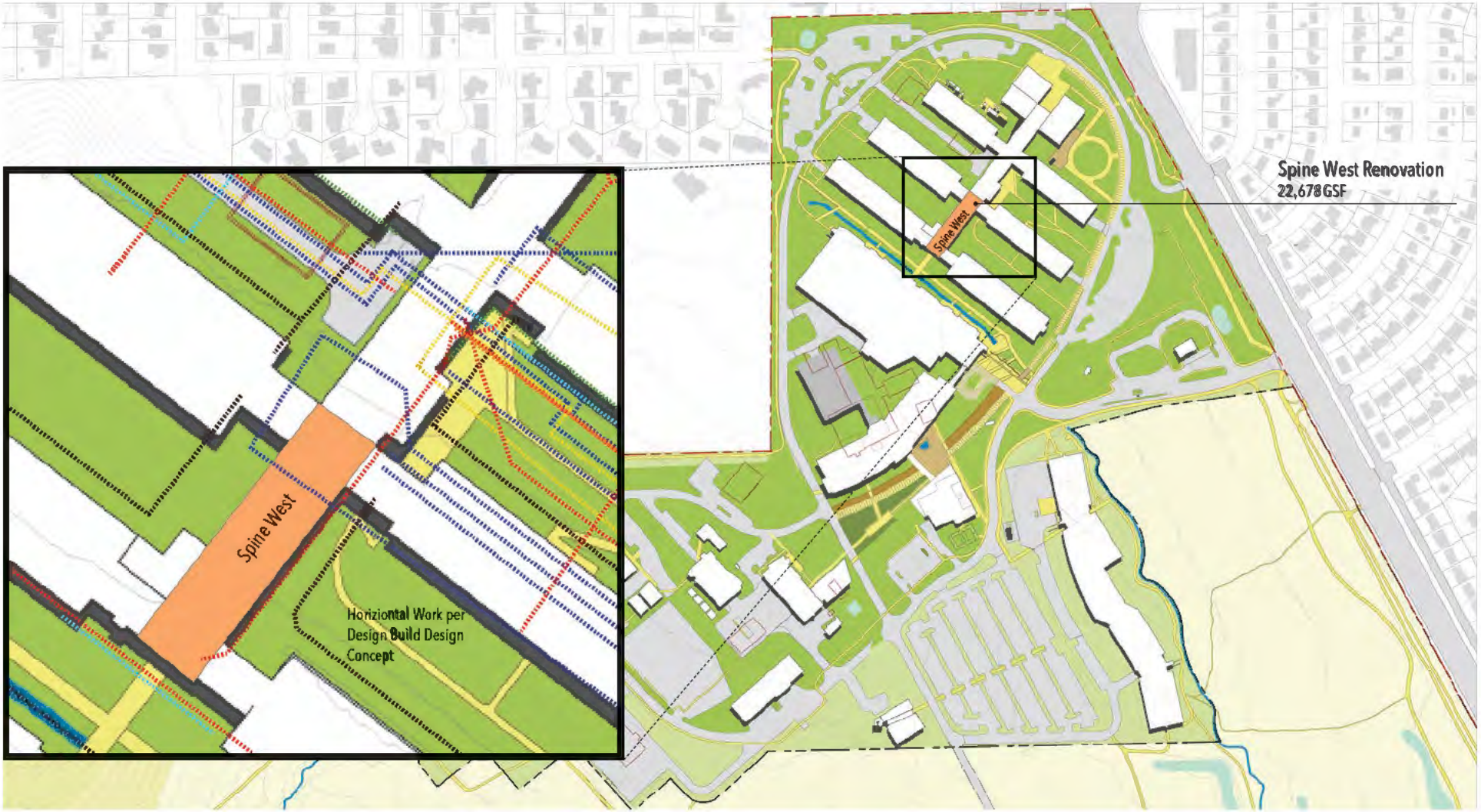
BOULDER PROJECTS

The following projects are also identified in the Boulder Laboratories Master Plan

Note: Building 1 Wings 5 and 4 are not included in this section, as these renovations are already funded.

Building 81 at NIST Boulder Laboratories *(Source: The Urban Collaborative)*

SPINE WEST RENOVATION



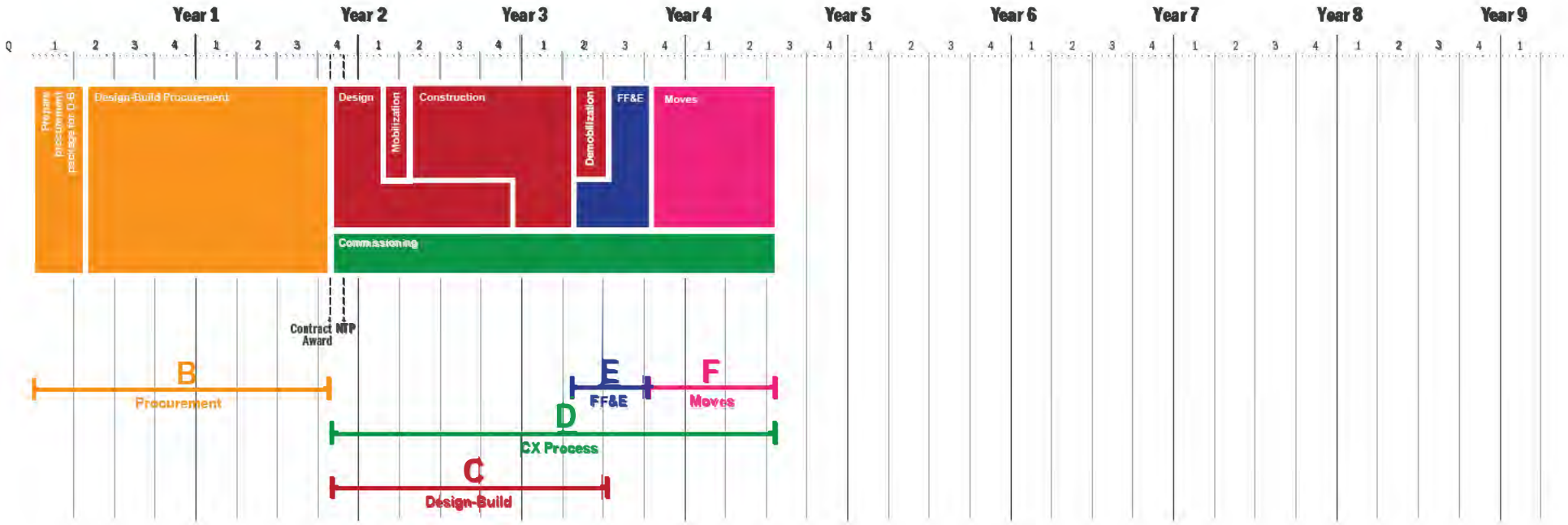
GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

June 2020

SPINE WEST: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Spine West project consists of renovating 22,678 GSF of Building 1 on two floors between Wings 3 and 6 and to the connector with Building 81. The renovation will result in advanced physical science laboratories on the lower floor with offices and collaboration spaces on the upper level.

Building 1 was constructed in 1954 and is eligible for listing on the National Register of Historic Places. Two of the six wings that extend out from the center Spine, Wings 3 and 6, have been fully modernized. A Design-Build contract for the renovation of Wings 5 and 4 was recently awarded and is fully funded. While the conceptual design for the Spine West project was completed with those for Wings 5 and 4, the project is dependent upon the completion of the Building 3 Addition so that research programs requiring high-bay space can be moved out of the Spine West area. The proposed Spine West renovation will be extensive - tearing back the building to the structure while maintaining key historic character-defining features. All the work must comply with the Secretary of the Interior's Standards for the Treatment of Historic Structures.

The comprehensive project is estimated to take four and a half years. Within this schedule, key phases have been identified with a letter. A concept design and specification package as been completed so a Program of Requirements is not needed. This project will commence with the DB procurement package and award of the DB contract (B). The DB phase is estimated at one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and scientific equipment (F).
The Spine West project is programmed with CRF funds and was bid in FY2020 to cost [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimate.

(b)(5)

SPINE WEST: DETAILED COST

The cost estimate is based on the actual 2020 Design/Build bid costs plus the estimated Owner's Additional Costs. The estimate assumes the building is 100% level 3 renovation with minimal specialized laboratory building requirements. There is no horizontal work associated with this project. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary		
Design/Build Bid Cost		
Design Contingency		
Construction Contingency		
Estimated Construction Cost		
Predesign		
Design		
Permits		
Construction Management Oversight & Commissioning		
PCAS/LEED Certification		
Furniture, Fixtures, & Equipment		
Moving Costs		
Owner's Additional Project Costs		
Subtotal Project Cost		
Owner's Institutional Support Tax		
Total Project Cost		

Intentionally Left Blank

WING 1 & HEADHOUSE RENOVATION

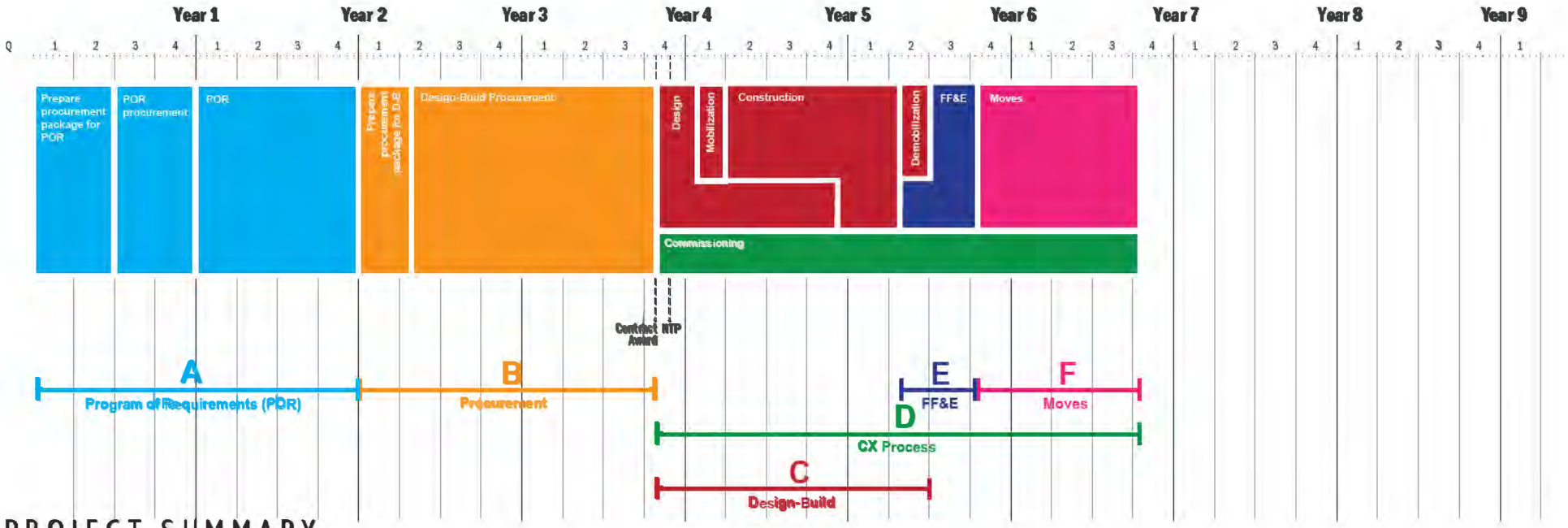
GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

June 2020

WING 1 AND HEADHOUSE: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Wing 1 and Headhouse project consists of renovating 19,625 GSF of Building 1 into advanced physical science laboratories and offices as well as renovating the Headhouse/Conference center (approximately 22,395 GSF), which serves as the iconic image and "front door" to Building 1. Additional components of this project include constructing a new loading dock with entry drive between Wings 1 and 3, demolition of two small temporary office structures, and site and landscape upgrades. The conference center in the Headhouse is undersized to serve the Boulder Labs programs and consists of an auditorium and a few meeting rooms that need extensive upgrades. The library space will be re-imagined to support the conference center with collaboration and meeting spaces while retaining its architectural integrity, as well as continuing to provide needed library services such as research assistance and on-line resources.

Building 1 was constructed in 1954 and is eligible for listing on the National Register of Historic Places. The Wing 1 renovation will be extensive- tearing back the building to the structure while maintaining key historic character-defining features. The Headhouse renovation will also be extensive while care is taken to maintain and protect the architectural integrity and historic character-defining features of the exterior appearance, lobby, library and other spaces. All the work must comply with the Secretary of the Interior's Standards for the Treatment of Historic Structures.

The comprehensive project is estimated to take six and three-quarter years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and awarding the DB contract(B). The DB phase is estimated at just over one year (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at into occupancy. The project finishes with the installation of FF&E and then the move-in of staff and scientific equipment (F).

The Wing 1 and Headhouse project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

WING 1 AND HEADHOUSE: DETAILED COST

The cost estimate for Wing 1 is calibrated to the actual 2020 bid cost of Building 1 Wing 4. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate assumes the renovation of Wing 1 is 100% level 3 renovation with specialized laboratory building requirements. The project also includes the renovation of the headhouse/ conference center and demolition of the existing Annexes (1C and 1D). The headhouse is estimated at a level 2 renovation and does not include laboratory facilities. It includes the relocation and construction of a new loading dock and drive. The horizontal work associated with this project includes the construction of Quad C. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	[redacted]
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs*	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

Intentionally Left Blank

SPINE EAST RENOVATION

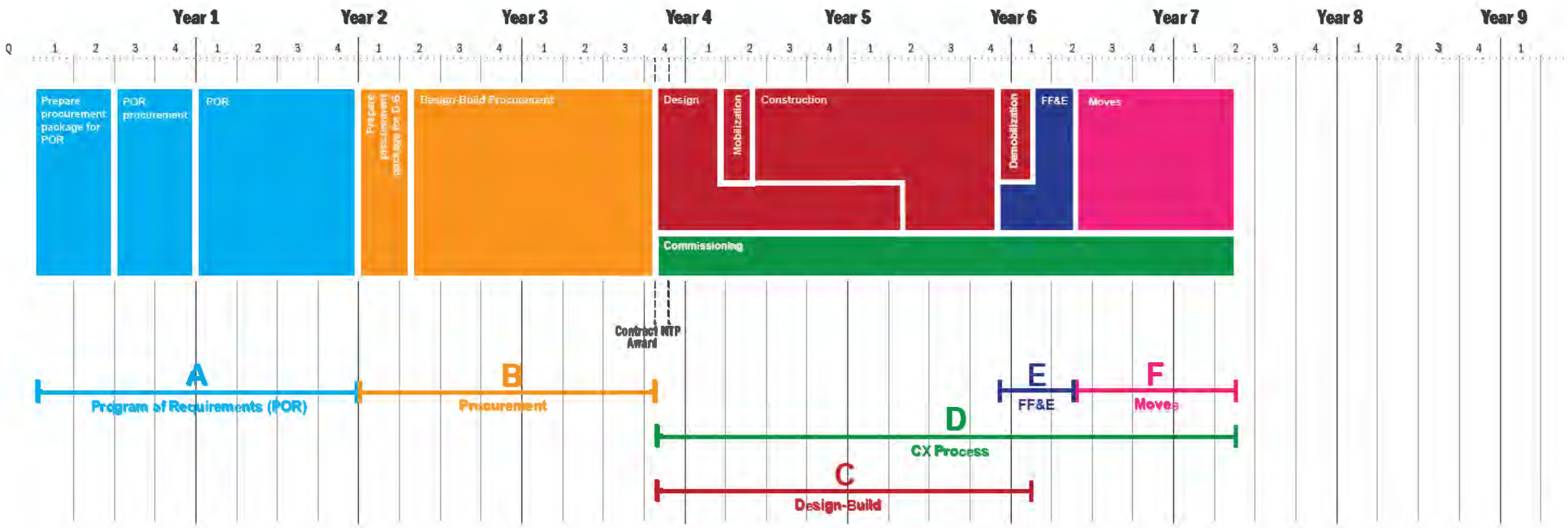
GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

June 2020

SPINE EAST: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Spine East project consists of renovating 48,620 GSF of Building 1 on three floors between Wings 3 and 4 and the Headhouse, and will result in advanced physical science laboratories, office and collaboration spaces.

Building 1 was constructed in 1954 and is eligible for listing on the National Register of Historic Places. The Spine East renovation will be extensive - tearing back the building to the structure while maintaining the exterior appearance and key historic character-defining features. All the work must comply with the Secretary of the Interior's Standards for the Treatment of Historic Structures.

The comprehensive project is estimated to take seven and a half years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow at least one year into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of stall and scientific equipment (F).

The Spine East project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

SPINE EAST: DETAILED COST

The cost estimate is calibrated to the actual 2020 bid cost of Building 1 Spine West. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)		
Primary Facilities		
Supporting Facilities		
Additional Project Costs (IT/Security)		
Design Contingency		
Construction Contingency		
Estimated Construction Cost		
Predesign	[redacted]	[redacted]
Design		
Permits		
Construction Management Oversight & Commissioning	[redacted]	[redacted]
PCAS/LEED Certification		
Furniture, Fixtures, & Equipment		
Moving Costs		
Owner's Additional Project Costs		
Subtotal Project Cost		
Owner's Institutional Support Tax		
Total Project Cost		

Intentionally Left Blank

WING 2 RENOVATION / CONSTRUCT ENTRY PAVILION

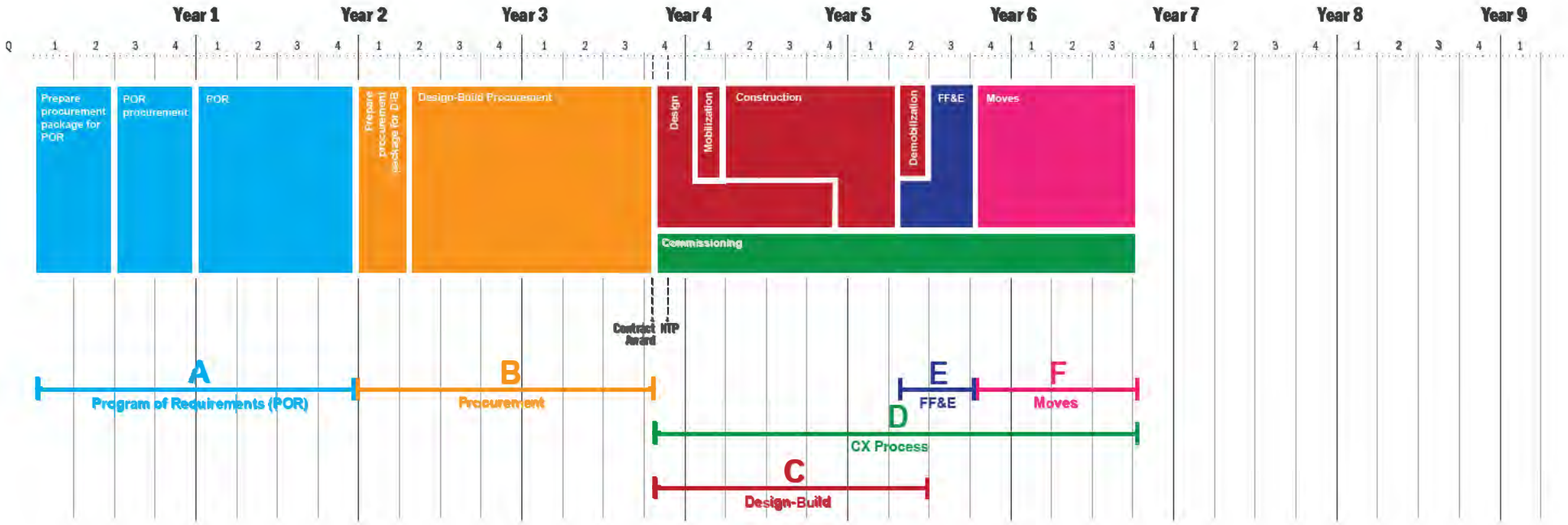
GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

June 2020

WING 2 AND ENTRY PAVILION: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Wing 2 and Entry Pavilion project consists of renovating 21,647 GSF of Building 1 into advanced physical science laboratories and offices and constructing a 10,000 GSF new entrance pavilion. Additional components of this project include demolition of the existing loading dock, a new entry plaza and vehicle drop-off, landscaping and sidewalk improvements. The Entry Pavilion will reorient the building entrance closer to the visitor parking and will provide space for full security screening of Conference Center visitors without requiring check-in through the Security Building at the Campus entry. The new pavilion and approach are envisioned as warm and inviting for visitors and, if space allows, the pavilion could also house an exhibit area with Boulder Campus history displays and research artifacts.

Building 1 was constructed in 1954 and is eligible for listing on the National Register of Historic Places. The Wing 2 renovation will be extensive, tearing back the building to the structure while maintaining key historic character-defining features. The new Entry Pavilion will be designed in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Structures.

The comprehensive project is estimated to take six and three-quarter years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take one and a half years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at just under two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific and security screening equipment (F).

The Wing 2 and Entry Pavilion project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

WING 2 AND ENTRY PAVILION: DETAILED COST

The cost estimate for Wing 2 is calibrated to the actual 2020 bid cost of Building 1 Wing 4. It is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The estimate assumes the renovation of Wing 2 is 100% level 3 renovation with specialized laboratory building requirements. The project also includes the construction of the new entrance pavilion and the demolition of the existing loading dock. The horizontal work associated with this project includes the construction of Quad B and new walkways, plaza, and landscaping. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

Intentionally Left Blank

MANAGEMENT RESOURCES CENTER

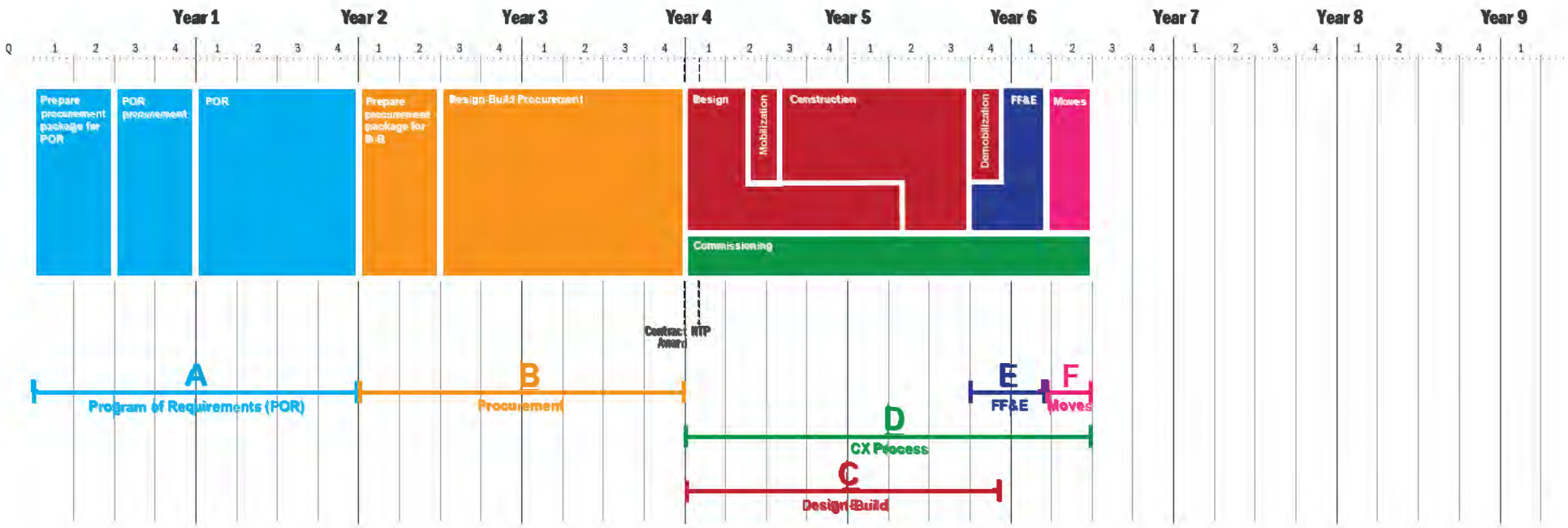
GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

June 2020

MANAGEMENT RESOURCES CENTER: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Management Resources (MR) Center project consists of constructing a new 60,000 GSF facility and demolishing buildings 4, 5, 3A, 21, 25, 25MI, 111, and 112 as well as connecting utilities, reconfiguring the roadway to B42 and the Boulder Computing Facility, creating new parking lots, relocating the North section of Curie Circle, and constructing the upper (Western) section of the Campus green – the West Quad. This facility will consolidate most NIST management resources staff and Campus support functions into a single building, allowing the demolition of a number of outdated, modular and/or inefficient buildings. Consolidation will yield savings in space and utility costs, as well as improved productivity.

The new MR Center is planned as two distinct, but connected, facilities – a two-story office building and a single-story high-bay building for maintenance shops, equipment, and vehicle storage. Both facilities will be designed to achieve net-zero energy use and LEED Gold or Platinum certification. This building will be placed in the location of several of the existing buildings listed for demolition, so swing-space for staff will also be required prior to construction. Additionally, the existing electrical duct bank and manholes should be relocated to clear the proposed footprint of the new building.

The comprehensive project is estimated to take six and a half years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated at two years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and equipment (F).

The MR Center project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

MANAGEMENT RESOURCES CENTER: DETAILED COST

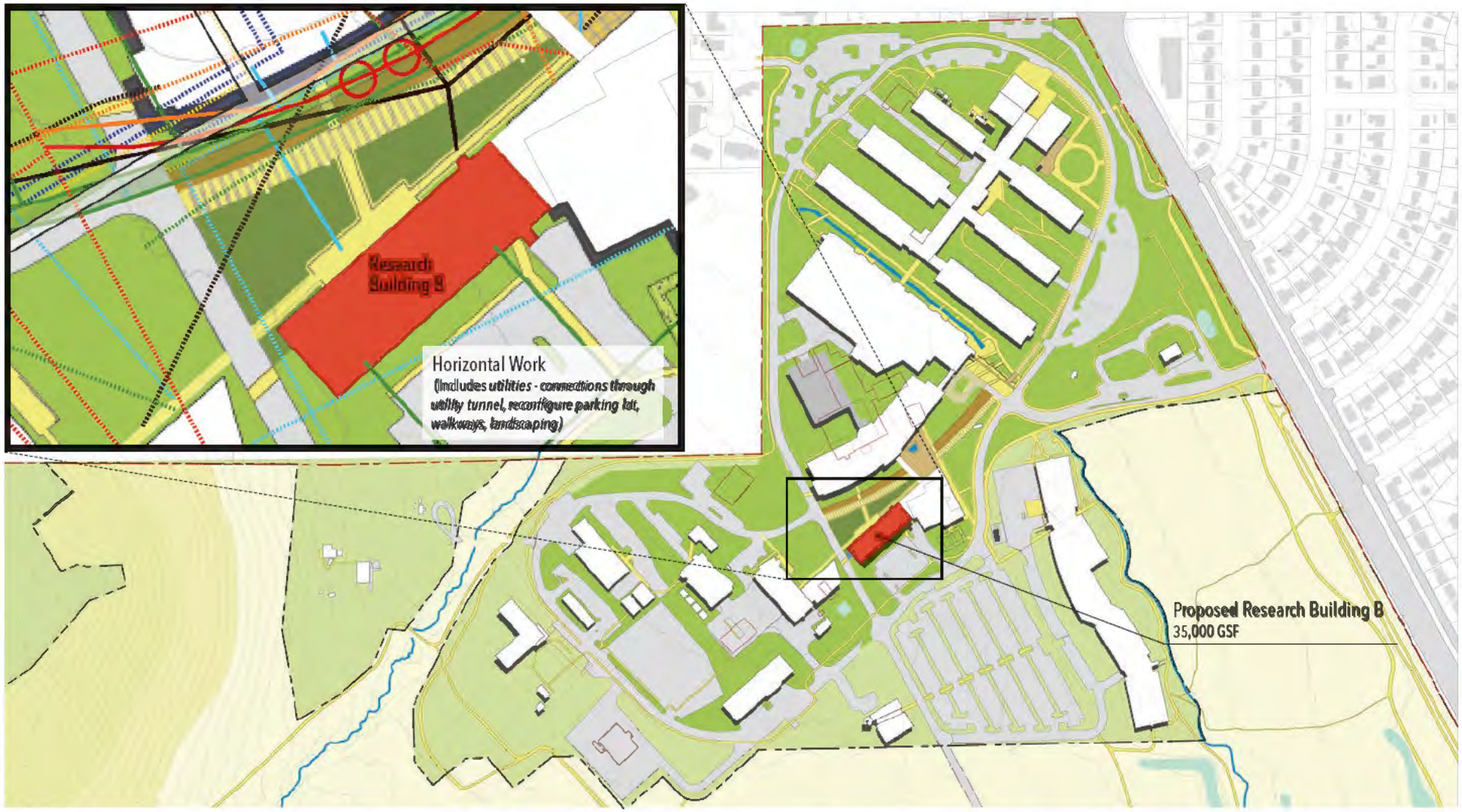
The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction. The project includes the demolition of buildings 4, 5, 3A, 21, 25, 25MI, 111, and 112. The project also includes the construction of the West Quad. The estimate includes horizontal work such as new utilities, new parking lots, and paving. It includes the reconfiguration of the roadway to Building 42 and the BCF as well as the relocation of the north section of Curie Circle. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)		
Primary Facilities		
Supporting Facilities		
Additional Project Costs (IT/Security)		
Design Contingency		
Construction Contingency		
Estimated Construction Cost		
Predesign	[redacted]	[redacted]
Design		
Permits		
Construction Management Oversight & Commissioning	[redacted]	[redacted]
PCAS/LEED Certification		
Furniture, Fixtures, & Equipment		
Moving Costs		
Owner's Additional Project Costs		
Subtotal Project Cost		
Owner's Institutional Support Tax		
Total Project Cost		

Intentionally Left Blank

RESEARCH BUILDING B

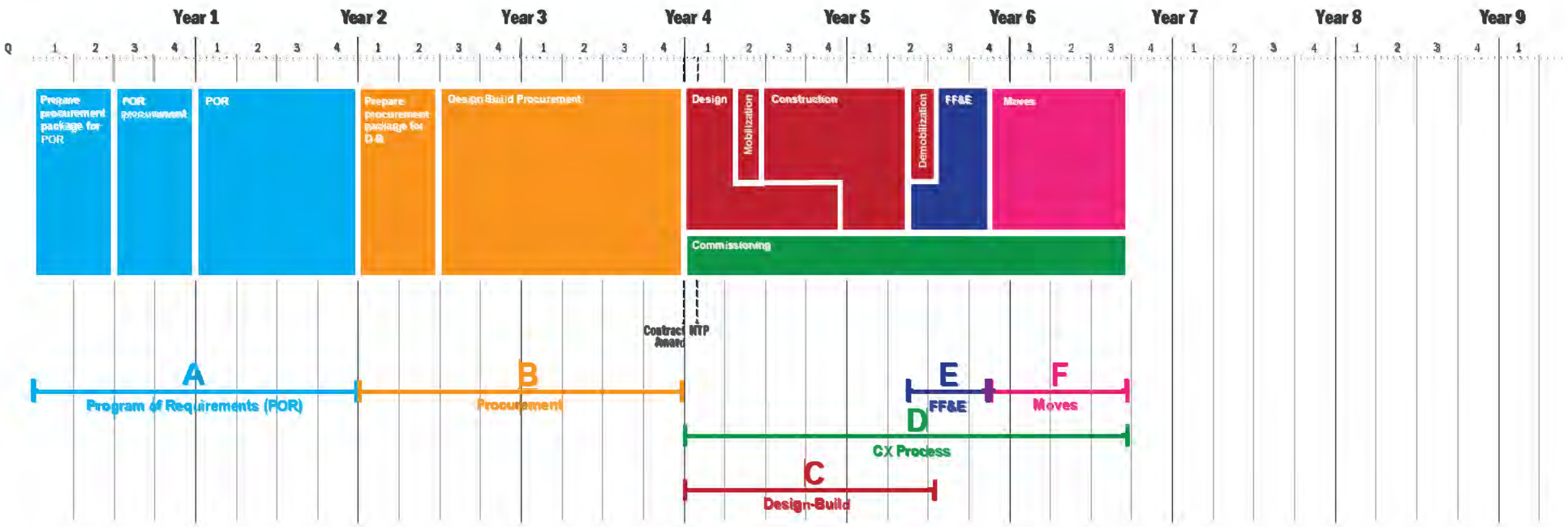


GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

RESEARCH BUILDING B: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

Research Building B will be a new 35,000 GSF advanced physical science research facility planned as two occupied floors with a mechanical penthouse. It will be located next to, and connected with, Building 24 through an interior pedestrian connection, and will define and enclose the southern side of the Campus green. If needed, an elevated pedestrian connection to the Building 3 Addition would also be constructed. Other aspects of the project will include connecting the utilities through the underground tunnel, reconfiguring the parking lot, and constructing walkways and landscaping for the East Quad.

The comprehensive project is estimated to take six and three-quarter years. Within this schedule, key phases have been identified with a letter. Developing a POR (A) is estimated to take two years leading to the commencement of the DB procurement package and ultimately awarding the DB contract (B). The DB phase is estimated to take one and a half years (C). Enhanced commissioning (D) will start in design, continue through construction, and follow into occupancy. The project finishes with the installation of FF&E (E) and then the move-in of staff and scientific equipment (F).

The Research Building B project is programmed with CRF funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

RESEARCH BUILDING B: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction. The project includes a bridge connection the Building 3 addition. The estimate includes horizontal work such as new utilities connected through the utility tunnel, the reconfiguration of the parking lot, construction of walkways, landscaping. Detailed project cost estimates and additional project cost descriptions are located in the Appendix. FF&E does not include specialty scientific equipment.

(b)(5)

Project Cost Summary (Escalated to FY2021)
Primary Facilities
Supporting Facilities
Additional Project Costs (IT/Security)
Design Contingency
Construction Contingency
Estimated Construction Cost
Predesign
Design
Permits
Construction Management Oversight & Commissioning
PCAS/LEED Certification
Furniture, Fixtures, & Equipment
Moving Costs
Owner's Additional Project Costs
Subtotal Project Cost
Owner's Institutional Support Tax
Total Project Cost

Intentionally Left Blank

BUILDING 51 SECURITY CENTER ADDITION

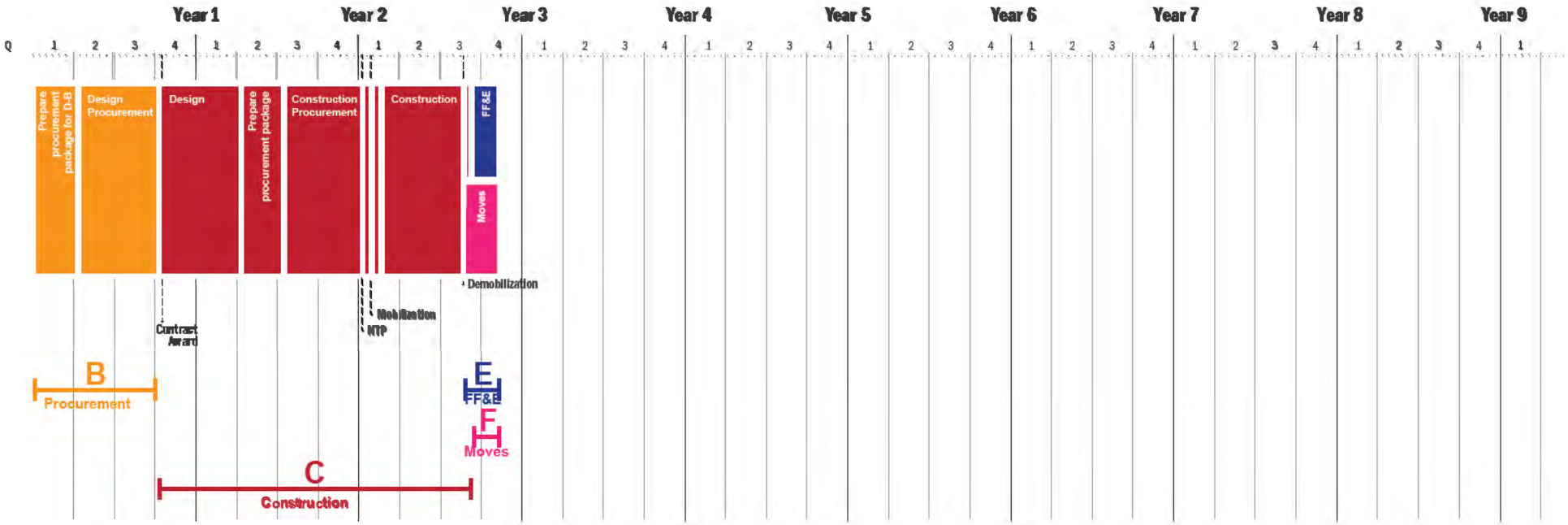
GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

June 2020

BUILDING 51 SECURITY CENTER ADDITION: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Building 51 Security Center Addition project includes constructing an 800 GSF addition on the north side of the existing facility, as well as reconfiguring roadways and parking. The building addition will provide needed space for security screening and to ease congestion for visitors. Needed improvements in traffic flow and vehicle security screening will be accomplished by separating visitor and commercial vehicles upon entry to the Campus. Visitors will park and their vehicles screened at the front of the Center, while commercial vehicles will be screened at the back, northern side, of the Security Center.

The comprehensive project is estimated to take approximately two years and eight months. Within this schedule, key phases have been identified with a letter. This project will commence with the development of an A/E design procurement package and award of the design contract (B).

The design phase is estimated to be six months. Development of a construction procurement package will follow, leading to award of the construction contract (C). The project finishes with a short, one-to-two month, period for the installation of FF&E and move-in (F).

The Building 51 Security Center Addition project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted] If escalated to 2030 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted] If escalated to 2027 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

BUILDING 51 SECURITY CENTER ADDITION: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. It assumes the building is 100% new construction. The horizontal work associated with the project includes the reconfiguration of roadways and parking lots around Building 51. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix.

(b)(5)

Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

FY2027 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

FY2030 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

Intentionally Left Blank

STAFF/VISITOR PARKING

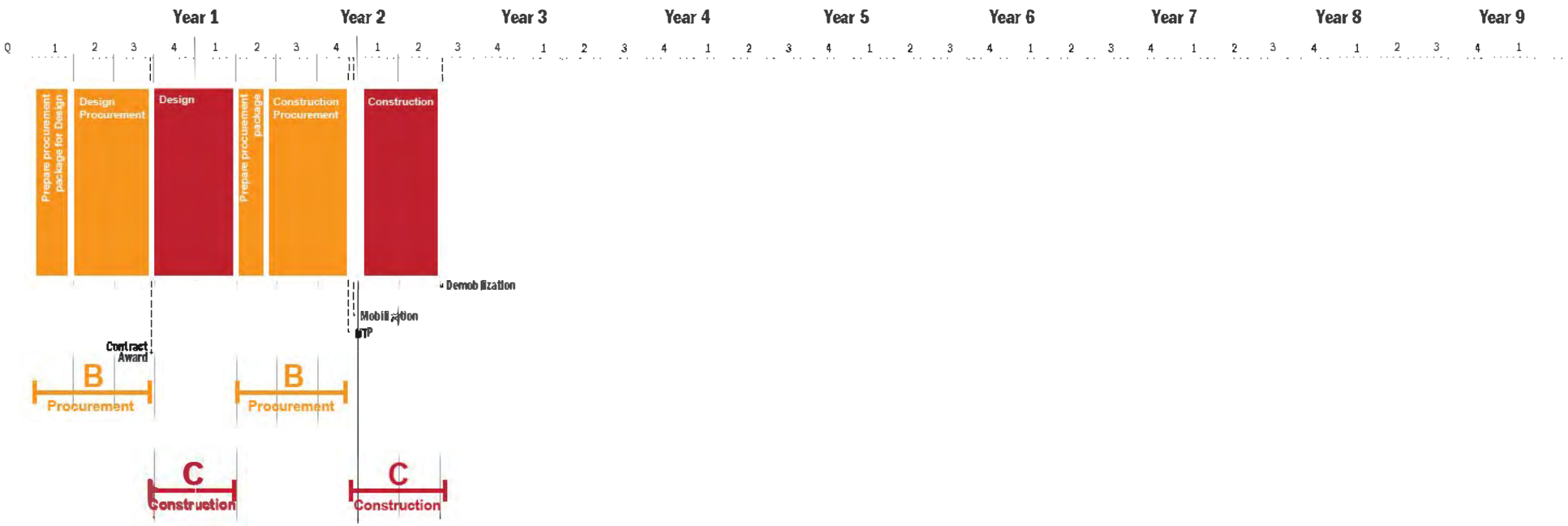
GRAPHIC LEGEND

- Property Boundary
- Elevation Contours
- Pavement
- Sidewalks
- Existing Facility to Remain
- Demolished Facility/Pavement
- Renovated Facility
- Proposed Facility
- Fencing
- Existing/Proposed Electrical
- Existing/Proposed Phone
- Existing/Proposed Water
- Existing/Proposed Sanitary Sewer
- Existing/Proposed Stormwater
- Existing Chilled Water
- Existing Steam & Condensate

0 225ft 450ft 675ft 900ft 1,125ft

June 2020

STAFF/VISITOR PARKING: CONSOLIDATED PROJECT SCHEDULE



PROJECT SUMMARY

The Staff/Visitor Parking project includes constructing a new parking lot to accommodate 155 vehicle spaces, reconfiguring of roadways, and constructing a new arroyo for collecting stormwater. The new parking lot will be accessible to visitors and staff, and it would allow them to bypass the vehicular screening at the Visitor Center as the lot would be outside the Campus security perimeter with access points to and from the public roadway. It is convenient to the Building 101 Conference Center and would enable visitors to park their vehicles and walk into the Entry Pavilion for security screening. This will remove vehicular pressure from the Security Center and guard booth, allowing it to primarily serve employees, delivery truck drivers, and others that have need to use a vehicle on Campus. A new reject lane will also be constructed that will allow rejected vehicles to easily exit the Campus without causing further congestion to the Campus entry area.

The comprehensive project is estimated to take two and a half years. Within this schedule, key phases have been identified with a letter. This project will commence with the development of an A/E design procurement package and award of the design contract (B). The design phase is estimated to be six months. Development of a construction procurement package will follow, leading to award of the construction contract with a duration of approximately six months (C).

The Staff/Visitor Parking project is programmed with SCMMR funds and with a FY2020 contract award (FY2021 construction midpoint) is estimated to cost approximately [redacted]. If escalated to 2021 as shown in the $5M/year SCMMR Program schedule, the estimated total project cost is [redacted]. If escalated to 2020 as shown in the $7M/year SCMMR Program schedule, the estimated total project cost is [redacted] A summary of the rolled-up costs can be found on the following pages and detailed cost estimates can be found in the Appendix: Detailed Cost Estimates.

(b)(5)

STAFF/VISITOR PARKING: DETAILED COST

The cost estimate is escalated to FY2021 as the construction mid-point for an FY2020 contract award. The horizontal work associated with the project includes construction of the stormwater management arroyo. The estimates for the $7M and $5M appropriations are escalated at a 3% annual rate. Reference page 17 for the $7M appropriation schedule and page 18 for the $5M appropriation schedule. Detailed project cost estimates and additional project cost descriptions are located in the Appendix.

(b)(5)

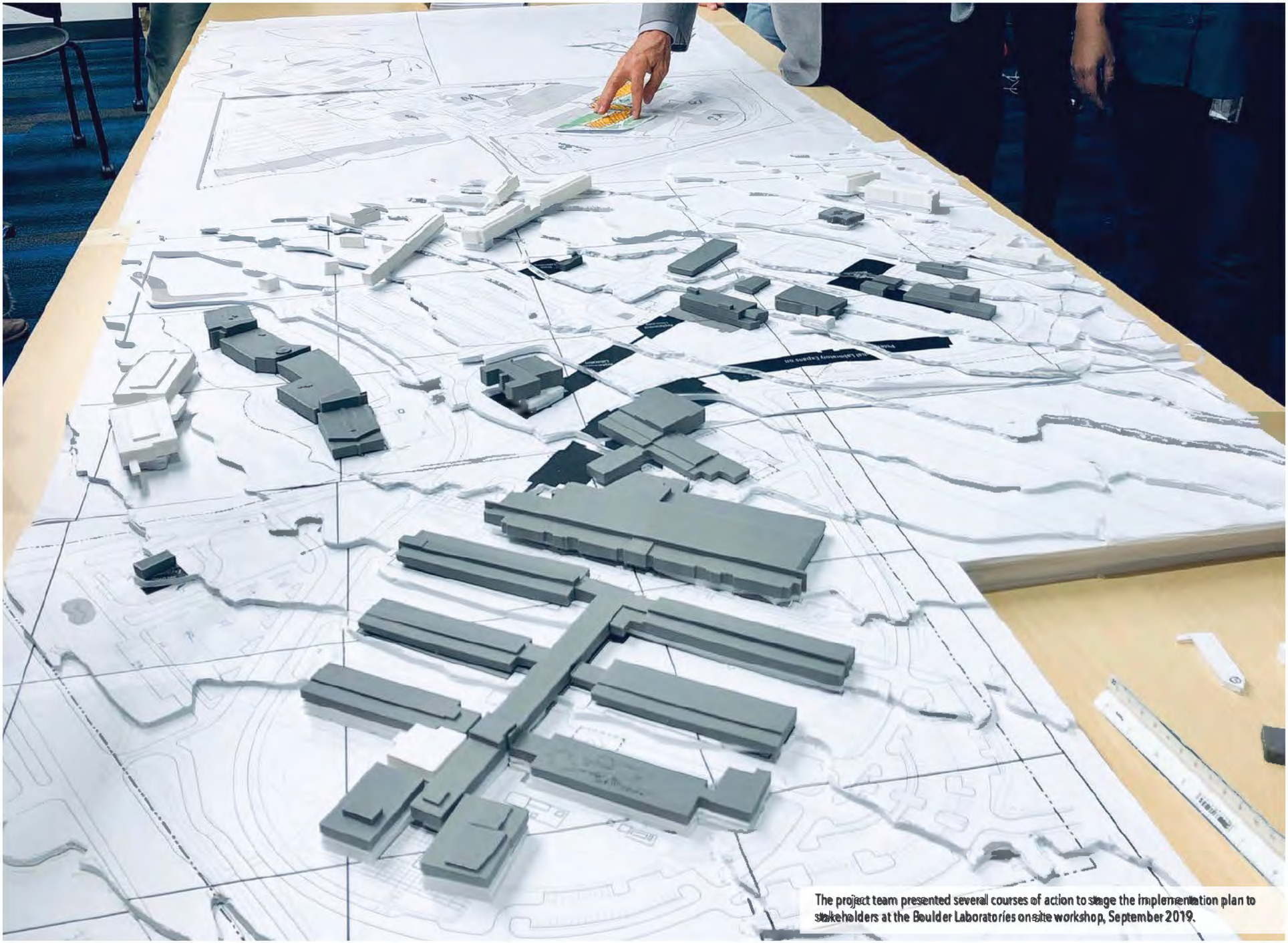
Project Cost Summary (Escalated to FY2021)	
Primary Facilities	
Supporting Facilities	
Additional Project Costs (IT/Security)	
Design Contingency	
Construction Contingency	
Estimated Construction Cost	
Predesign	
Design	
Permits	
Construction Management Oversight & Commissioning	
PCAS/LEED Certification	
Furniture, Fixtures, & Equipment	
Moving Costs	
Owner's Additional Project Costs	
Subtotal Project Cost	
Owner's Institutional Support Tax	
Total Project Cost	

FY2020 ($7M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

FY2021 ($5M Annual Appropriation Schedule)	
Estimated Construction Cost	
Owner's Additional Project Costs	
Total Project Costs	

Intentionally Left Blank

ACKNOWLEDGMENTS



The project team presented several courses of action to stage the implementation plan to stakeholders at the Boulder Laboratories on-site workshop, September 2019.

ACKNOWLEDGMENTS

NIST SENIOR LEADERSHIP
Robert (Skip) Vaughn, Chair
Chief Facilities Management Officer
Director, Office of Facilities and Property Management
National Institute of Standards and Technology

Del Brockett
Associate Director for Management Resources
National Institute of Standards and Technology

James Olthoff
Associate Director for Laboratory Programs
National Institute of Standards and Technology

Phillip Singerman (Retired, 2020)
Associate Director for Innovation & Industry Services
National Institute of Standards and Technology

Carroll Thomas,
Acting Associate Director for Innovation & Industry Services
National Institute of Standards and Technology

Marla Dowell
Boulder Laboratories Director
Director, Communications Technology Laboratory
National Institute of Standards and Technology

Kevin Kimball
Chief of Staff
Director's Office
National Institute of Standards and Technology

CONTRACT TECHNICAL POINT OF CONTACT
Susan Cantilli
Team Lead, Facilities Planning
Capital Asset Management & Facilities Planning Group
Office of Facilities & Property Management
National Institute of Standards and Technology

CONSULTANT TEAM
Mark Gillem
Principal-in-Charge
The Urban Collaborative

Lyndsey Deaton
Project Manager/Senior Architect
The Urban Collaborative

Jessica Kelly
Technical Lead
The Urban Collaborative

Mike Knowles
Senior Cost Estimator
The Urban Collaborative

Anna Backus
Senior Engineer
KPFF Consulting Engineers

Patrick McCray
Assistant Planner
The Urban Collaborative

Kellie Dziedzic
Assistant Planner
The Urban Collaborative

KEY STAKEHOLDERS
Amy Sebring
Bob Hickernell
Bradley Alpert
Brian Copello
Brenda Komloske
Bryan Faktor
Chris Colburn
Chuck Romine
Charles CJ Couch
Clyde Messerly
Daniel Sokolowski
Danielle Swarts
Elizabeth Donley
Eric Lin
Gerald Gloster
Greg Strouse
Howard Harary
James Burrus
Jerry Gloster
Jessica Caraway
Jim Fowler
Jim Kushmerick
Jim St. Pierre
John Bollinger
Julie Leonard
John Perkins
Julie Bruening
Katie Schlatter
Keith Weidenbach
Kelly Icenbice
Kristan Corwin
Lisa Eldrige
Mark Spurrier
Marla Dowell
Matt Wilkinson
Michael Frey
Mike Blackmor
Mike Fasolka
Nick Barbosa
Olivia McCasey
Rich Kelsey
Rob Dimed
Rob Glenn
Paul Hale
Phil Kemp
Phil Neuberg
Sean Sell
Skip Vaughn
Susan Cantilli
Susannah Schiller
Tim Halton
Tom Newton

ACRONYMS

APSRF	Advanced Physical Sciences Research Facility
CRF	Construction of Research Facilities
CTL	Communications Technology Laboratory
CX	Commissioning
DB	Design-Build
DBB	Design-Bid-Build
ECC	Estimated Construction Cost
FCI	Facility Condition Index
FFE	Furniture, Fixtures, & Equipment
FY	Fiscal Year
GPL	General Purpose Laboratory
GSF	Gross Square Footage
HVAC	Heating,Ventilation, and Air Conditioning
IT	Information Technology
LEED	Leadership in Energy and Environmental Design
LF	Linear Feet
MR	Management Resources
NIST	National Institute of Standards and Technology
OISM	Office of Information Management Services
PCAS	Architect-Engineer Post Construction Award Services
POR	Program of Requirements
SCMMR	Safety, Capacity, Maintenance and Major Repair
SPL	Special Purpose Laboratory
SRM	Standard Reference Material

Make no little plans; they have no magic to stir men's blood and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone be a living thing, asserting itself with ever-growing insistency.

Daniel Burnham, 1846-1912