**Operations Commissionsing PLAN TEMPLATE**

Based upon B3 Minnesota Sustainable Building Guidelines—VERSION 2.2

Notes to the reader have been added to this document within numerous “text boxes” such as this. These “text boxes” contain references to supporting documentation, suggestions, and/or instructions pertaining to the Operations Commissioning Plan. They are intended to be deleted once the template is customized for a particular project.

# TABLE OF CONTENTS

[TABLE OF CONTENTS 2](#_Toc369706069)

[1 INTRODUCTION 3](#_Toc369706070)

[2 GENERAL OPERATIONAL COMMISSIONING PLAN TASKS 4](#_Toc369706071)

[2.1 Evaluate Existing Facility Operations (1.01) 4](#_Toc369706072)

[2.2 Identify Design & Construction Commissioning Team (1.02) and Operations Commissioning Team (1.03) 4](#_Toc369706073)

[2.3 Incorporate Operations Commissioning Plan Items (1.04) 5](#_Toc369706074)

[2.3.1 Operations and Maintenance Manuals 6](#_Toc369706075)

[2.3.2 Funding and Staffing Plan 6](#_Toc369706076)

[2.4 New Employee Training Program (1.07) 6](#_Toc369706077)

[2.5 Next Use (1.09) 6](#_Toc369706078)

[3 SYSTEM TURNOVER PROCESS FROM CONSTRUCTION TO OPERATIONS (Section 2 of Appendix P-5a) 7](#_Toc369706079)

[3.1 Turnover Prerequisites (2.01) and Authority for Official Acceptance of Turnover (2.02) 7](#_Toc369706080)

[3.2 Operations Team Familiarization with Project Documentation and Systems (2.03) **Error! Bookmark not defined.**](#_Toc369706081)

[3.3 Complete Systems Transfer from Contractors to Operators 2.04 7](#_Toc369706082)

[4 PROBLEM RESPONSE PLAN (Section 3 of Appendix P-5a) 7](#_Toc369706083)

[4.1 Problem Documentation Process (3.01) 8](#_Toc369706084)

[4.2 Problem Response Process (3.02) 8](#_Toc369706085)

[4.3 Problem Resolution Documentation Process (3.03) 9](#_Toc369706086)

[5 MAINTENANCE PLAN (Section 4 of Appendix P-5a) 9](#_Toc369706087)

[5.1 Moisture Prevention Practices (4.03) 10](#_Toc369706088)

[5.2 Moisture Response Practices (4.04) 10](#_Toc369706089)

[5.3 Preventive Maintenance Activities (4.06) 11](#_Toc369706090)

[6 ENERGY EFFICIENT OPERATIONS PLAN (In Development: Section 5 of Appendix P-5a) 11](#_Toc369706091)

[7 POST OCCUPANCY EVALUATION (Section 6 of Appendix P-5a) 11](#_Toc369706092)

[7.1 Nine Month Sustainable Post Occupancy Survey (SPOES) (6.02) 12](#_Toc369706093)

[7.2 Eighteen Month Sustainable Post Occupancy Survey (SPOES) (6.03) 12](#_Toc369706094)

[8 Annual Operations Commissioning Report (1.06) 12](#_Toc369706095)

[8.1 Problem Response Plan Annual Evaluation and Reporting (3.05) 12](#_Toc369706096)

[8.2 Cleaning Products Documentation (4.02) 13](#_Toc369706097)

[8.3 Moisture Control Documentation (4.05) 13](#_Toc369706098)

[8.4 Preventive Maintenance Documentation (4.07) 13](#_Toc369706099)

[8.5 Annual Building IAQ Performance Evaluation (4.09) 13](#_Toc369706100)

[8.6 Annual Evaluation and Reporting (4.10) 14](#_Toc369706101)

[8.6.1 Water Systems 14](#_Toc369706102)

[8.6.2 Energy Systems 14](#_Toc369706103)

[8.6.3 IEQ Systems 14](#_Toc369706104)

[8.6.4 Materials and Waste Systems 15](#_Toc369706105)

[9 Appendices 15](#_Toc369706106)

[9.1 Appendix: P-5b Operations Commissioning Matrix– Activities & Responsibilities 15](#_Toc369706107)

[9.2 Other Appendices 15](#_Toc369706108)

# INTRODUCTION

The Operations Commissioning Plan‘s intent is to define practices to document the practices during the operation of a building until its next use. An Operations Management Plan should outline items referenced in Appendix P-5a:

* Systems Turnover Process (from Construction to Operations)
* Operations and Maintenance Manuals (O&M Manuals as per conventional contracts)
* Problem Response Plan
* Maintenance Plan
* Measurement and Verification Plan
* Systems Operations Manual
* Funding and Staffing Plan

The Operations Management Plan should be developed during design and construction. The resulting processes in operations of the building should comply with the Operations Commissioning Plan. Please refer to the Operations Commissioning Matrix- Activities & Responsibilities (refer to this document in the Appendices) for an outline of scheduling these tasks through Design and Construction.

The Operations Commissioning Plan shall evolve as follows:

**Design Development Phase**

Operations Commissioning Plan shall be outlined during a project’s Design Development Phase; a time when operations issues shall be coordinated with design and construction issues.

Team members shall review and participate in coordination of the Operations Commissioning Plan and the Design and Construction Commissioning Plan

**Construction Documents Phase**

A complete Operations Commissioning Plan shall be developed during the Construction Documents phase of the design and construction project in cooperation with the Design and Construction Commissioning Team.

**Correction Phase**

The Operations Commissioning Plan shall be finalized during the Correction Period when all technical details of the building systems are known.

The sections in this template should be included in the Operations Management Plan. It is recommended that the headings listed here also be used. The number designations in parentheses (e.g. 3.01, 3.02, 3.03, etc.) are references to other B3 Guideline documents and coordinated with Appendix P-5b: Operations Commissioning Matrix.

Insert customized project introduction.

During On-going Operations, review all aspects of the Operations Commissioning Plan at least annually. Update the Plan as needed to reflect changes in equipment or practices. This is referred to as the Annual Operations Commissioning Review and Plan Update.

The FOM updates the facility’s operations budget and staffing as required to continue the implementation of the Operations Commissioning Plan based on updates to the Operations Commissioning Plan and changes to the equipment, systems, or operations.

# GENERAL OPERATIONAL COMMISSIONING PLAN TASKS

## Evaluate Existing Facility Operations (1.01)

Evaluate existing facility operations to provide a reference point of operating issues for use in planning operation of the future facility or the existing renovated facility. Note that all existing state buildings must participate in the B3 Benchmarking Database.

Insert evaluation of existing facility’s operation in order to assist in planning operations commissioning processes.

## Identify Design & Construction Commissioning Team (1.02) and Operations Commissioning Team (1.03)

Identify a Facility Operations Manager (FOM) who will manage maintenance and operations of the facility, be responsible for understanding Operations and Maintenance manuals, and monitor and report ongoing performance of the facility. The FOM should participate throughout the design process for continuity into final operation.

This person shall be part of the Design and Construction Commissioning Team and work closely with the Guideline Leader during design phases. The FOM shall represent operations issues from the beginning of the Design and Construction Commissioning Process and shall also be part of the Operations Commissioning Team once it is formed.

Identify Leader and Members of the Operations Commissioning Team during the Design Development phase of the design and construction project. The team shall be comprised of the following individuals, plus any added expertise needed for specific building systems:

* Facilities Operations Manager (FOM) is accountable for facility performance and manages or performs ongoing operational practices, maintenance and corrective actions. FOM may also fill the role of Guideline Leader during ongoing occupancy phases.
* The person from the Operations Work Team who will be in charge of compliance with the Guidelines during Ongoing Occupancy (this may be the Guideline Leader if applicable to Agency Process). This person will document ongoing management, maintenance and correction actions, and complete annual and interim reporting as per the Outcome Documentation Forms.

*Identify Design and Construction Commissioning Team.*

Identify the following individuals (or groups, if this effort is handled by more than one individual):

* Facility Operation Manager
* Operations Work Team Member responsible for managing compliance with the guidelines, including reporting requirements during operation

Identify the measures that are taken to ensure that these roles are filled in the event of staffing or job changes.

Design and Construction Team Members:



Facility Operations Manager(s):

Operations Work Team Member(s):

Measures taken to identify who will fill these roles in the event of staffing or job changes:

## Incorporate Operations Commissioning Plan Items (1.04)

The Operations Commissioning Plan shall include directly or by reference provision for all items required in the Commissioning Guideline P.5 for planning, implementing, or documenting activities from Correction Period through the life of the project. The Operations Commissioning Plan includes by reference the following documents that may be packaged separately but shall be coordinated with all other parts of the Operations Commissioning Plan. (note some of the items listed in section 1.04 of appendix P-5a are located elsewhere in this document

* Operations and Maintenance Manuals (O&M Manuals as per conventional contracts)
* Funding and Staffing Plan

### Operations and Maintenance Manuals

Insert or include as appendices O&M manuals (as per conventional contracts)

### Funding and Staffing Plan

Create, insert or include as appendix funding and staffing plan. Include process of identification of facility operations budget and staffing to continue implementation of the Operations Commissioning Plan (this document), and method of updating this document as required during the Annual Operations Commissioning Review and Plan Update (1.05), Annual Operations Commissioning Report (1.06) and all other ongoing tasks outlined in this plan, including the submission of outcome documentation to the B3 Guidelines Tracking Tool (1.08).

## New Employee Training Program (1.07)

Orient new members of the facility’s operations and maintenance management and staff to the building system documentation and the Operations Commissioning Plan. All staff shall be familiar, at a level appropriate with their responsibilities, with the history and upkeep of project records and their contents from review of prior phases of the Operations Commissioning Plan and its supporting documents.

Create, insert or include as appendix New Employee Training Program.

## Next Use (1.09)

Provide transition data, history, requirements and Guideline plans and reports to new owner and facility manager. Encourage the new owner to proactively support the Guidelines and the Operations Commissioning process.

Describe the method for archiving and providing relevant building operating information for next use--i.e. if the building changes owners or uses.

# SYSTEM TURNOVER PROCESS FROM CONSTRUCTION TO OPERATIONS (Section 2 of Appendix P-5a)

## Turnover Prerequisites (2.01) and Authority for Official Acceptance of Turnover (2.02)

Define the minimum level of completeness and/or performance required prior to the formal transfer of responsibility from the construction team (contractors) to the operations team (owner). These prerequisites must be objective and enforceable and communicated clearly to the Design and Construction team for inclusion in the bid documents.

Define who, typically someone representing the Owner, will have final approval authority for the transfer of the systems from the contractors to the owner.

Create, insert or include as appendix the Turnover Prerequisites, including who will have final authority for the transfer of the systems from the contractors to the owner.

## Complete Systems Transfer from Contractors to Operators 2.04

Systems shall be turned over to the operations team either all at once or on a pre-defined piecemeal basis. However, once a system is turned over to the owner, the contractors shall obtain permission and provide full documentation for all work performed on any turned-over system.

Create, insert or include as appendix the documentation of System Transfer after it has taken place.

# PROBLEM RESPONSE PLAN (Section 3 of Appendix P-5a)

The Problem Response Plan is part of the Operations Commissioning Plan and shall cover the systems and materials commissioned under Operations Commissioning Scope. Key components of the Plan are clear assignments of responsibility to individuals and defined lines of communication. Incorporate a planned response to anticipated feedback or triggers indicating potential performance problems such as an increase in IEQ complaints or aberrations in monitored resource use. This includes problems discovered by the Operations Staff as they implement their Work Order Verifications as defined in Section 5.11 of Appendix P-5a: Facility Work Order Verifications.

If the project is part of a campus (e.g., under the ownership or management of a single entity such as a corporation, government, college or university), the equipment and/or systems defined under the project shall follow the Problem Response Plan requirements.

Typically, campus-style facilities employ a comprehensive computerized maintenance management systems (CMMS) which manages and documents the campus equipment and systems’ preventive maintenance schedules, troubleshooting calls, work orders, etc. Please note below if, and how the Problem Response Plan components listed below are not covered through the use of the CMMS system. If they are not covered through the use of the CMMS system, please describe the process for satisfying these requirements.

If the Problem Response Plan components are already included in the campus-wide operations and maintenance program, the Contractor shall document how each component is addressed for the pre-defined acceptance authority. If there are Problem Response Plan components not included in the existing campus-wide operations and maintenance program, the Contractor shall describe how each such component will be addressed and implemented. This documentation shall be provided to the pre-defined acceptance authority for review and approval.

## Problem Documentation Process (3.01)

Define a process by which problems are documented and passed on to the appropriate party for attention.

Create, insert or include as appendix the Problem Documentation Process.

## Problem Response Process (3.02)

Predefine potential problem responses for use in timely and comprehensive management of each documented problem. Responses may include fixing or replacing broken components (including

correction work by installing contractors), recalibrating control devices, performing functional performance tests to help identify the root cause of a problem, redesigning an system that no longer meets the changing needs of the occupants, etc.

Create, insert or include as appendix the Problem Response Plan.

## Problem Resolution Documentation Process (3.03)

The Problem Response Plan process shall include a feedback loop for positive closure.

Create, insert or include as appendix the Problem Resolution Documentation Process.

# MAINTENANCE PLAN (Section 4 of Appendix P-5a)

The Maintenance Plan is part of the Operations Commissioning Plan and shall apply to all systems and materials commissioned under the Operations Commissioning Scope.

If the project is part of a campus (e.g., under the ownership or management of a single entity such as a corporation, government, college or university), the equipment and/or systems defined under the project shall follow the Maintenance Plan requirements.

Typically, campus-style facilities employ a comprehensive computerized maintenance management systems (CMMS) which manages and documents the campus equipment and systems’ preventive maintenance schedules, troubleshooting calls, work orders, etc. Please note below if, and how the Maintenance Plan components listed below are not covered through the use of the CMMS system. If they are not covered through the use of the CMMS system, please describe the process for satisfying these requirements.

If the Maintenance Plan components are already included in the campus-wide operations and maintenance program, document how each component is addressed for the pre-defined acceptance authority. If there are Maintenance Plan components that are not included in the existing campus-wide operations and maintenance program, the Contractor shall describe how each such component will be addressed and implemented. This documentation shall be provided to the pre-defined acceptance authority for review and approval (refer to Section 2.02 above).

## Moisture Prevention Practices (4.03)

Establish maintenance procedures that will identify unintended water intrusion, leakage or accumulation quickly and provide drying or removal of building structure elements within 48 hours of the unintended event.

Create, insert or include as appendix the Moisture Prevention Practices.

## Moisture Response Practices (4.04)

When exterior water intrusion, leakage from interior water sources, or other uncontrolled accumulation of water occurs, the intrusion, leakage or accumulation shall be corrected because of potential for these conditions to cause the growth of mold. (Title 8, Chapter 4, Section 3362(g) of California Occupational Safety and Health Standards, Sept. 2002.)

Create, insert or include as appendix the Moisture Response Process.

## Preventive Maintenance Activities (4.06)

Implement a preventive maintenance program for IAQ and other Indoor Environmental Quality factors in the building. The preventive maintenance plan shall include regularly scheduled checks to verify ongoing performance and to prevent failures of the facility and its systems. If the project is creating and Energy Efficiency Operations Manual, include verification of selected system performance compared to their respective Expected Performance Graph-Diagnostic Diagrams (refer to 6.10 and 6.11 below in Appendix P-5a). This can be modeled after EPA's Building Air Quality Program (1991) or their web-based system called I-BEAM (IAQ building education and assessment).

Create, insert or include as appendix the Preventive Maintenance Activities.

# ENERGY EFFICIENT OPERATIONS PLAN (In Development: Section 5 of Appendix P-5a)

The Energy Efficient Operations Manual is part of the Operations Commissioning Plan and documents important reference information for operating building systems. Tools supporting the processes outlined here are in development; please check the Operations Program details at [www.b3mn.org/operations](http://www.b3mn.org/operations) for current information.

Supporting templates at [www.b3mn.org/operations](http://www.b3mn.org/operations) are currently under development at the time of the writing of this template. Incorporate as reference the Energy Efficiency Operations Manual after project if, at the time of completion of the commissioning the Energy Efficiency Operations Manual process is supported (see www.b3mn.org/operations).

# POST OCCUPANCY EVALUATION (Section 6 of Appendix P-5a)

The post-occupancy evaluation process occurs at roughly nine and eighteen months after occupancy. The post-occupancy evaluation at the “Scan” level is supported by the B3 Program for State of Minnesota Bond funded projects, and is required for supported building types with a minimum number of occupants or residents. To see a list of supported building types and to begin the process please reference www.b3mn.org/poe/

## Nine Month Sustainable Post Occupancy Survey (SPOES) (6.02)

Nine months into the Correction Period conduct the first User Comfort & Satisfaction Survey as defined in the Assessment Plan.

Insert the Nine Month Post Occupancy Survey Report (provided by the SPOES team after the completion of the Nine Month survey).

## Eighteen Month Sustainable Post Occupancy Survey (SPOES) (6.03)

Eighteen months into the Correction Period conduct the second User Comfort & Satisfaction Survey as defined in the Assessment Plan.

Insert the Eighteen Month Post Occupancy Survey Report (provided by the SPOES team after the completion of the Eighteen Month survey).

# Submit Outcome Documentation (1.08)

Outcome Documentation in the B3 Guidelines Tracking Tool (trackingtool.b3mn.org) as required by the B3 Guidelines at the end of each phase of the design and construction process and throughout the on-going operations phase.

Describe the method of ensuring the Outcome Documentation (including annual updated versions of this document) is submitted into the B3 Guidelines Tracking tool. Include method of ensuring this task is completed in the event of staffing changes.

# Annual Operations Commissioning Report (1.06)

The Operations Commissioning Report is an evaluation of work at a particular point in time in comparison with the Commissioning Plan. After the correction period, complete an Operations Commissioning Report that documents monitored usage and other data, and includes a log of actions taken to address aberrations or problems.

Create, insert or include as appendix Operations Commissioning report annually during operations. Note that several items require annual reporting:

## Problem Response Plan Annual Evaluation and Reporting (3.05)

Each problem and its resolution shall be logged for incorporation into the annual Operations Commissioning Report.

Create, insert or include as appendix the Annual Evaluation and Reporting for the Problem Documentation Process.

## Cleaning Products Documentation (4.02)

Use ISO 14000 requirements for cleaning supplies in standard maintenance after building occupancy.

Document all cleaning products used and quantities of each for inclusion in the annual Operations Commissioning Report.

Create, insert or include as appendix a list of all cleaning products and quantities for the annual Operations Commissioning Report. Note non-compliance with ISO 14000 and document steps taken to remediate.

## Moisture Control Documentation (4.05)

Document all moisture intrusion events and their resolution for inclusion in the annual Operations Commissioning Report.

Create, insert or include as appendix the Moisture Control Documentation.

## Preventive Maintenance Documentation (4.07)

Document the preventive maintenance program, inventory of equipment, and scheduled work orders in the Operations Commissioning Plan. Log all completed preventive maintenance activities for inclusion in the annual Operations Commissioning Report.

Create, insert or include as appendix the annual Preventative Maintenance Documentation.

## Annual Building IAQ Performance Evaluation (4.09)

Perform an evaluation of building IAQ performance annually. Measure key factors that determines ventilation rate for the building (major pollutant or CO2) in the building occupied zones. Pollutant concentrations measured should be within the guideline range, and CO2 levels should be at or below 450 ppm over outdoor levels. If not, additional ventilation must be provided or sources eliminated until concentrations fall below action levels. Action values for each pollutant are given in Appendix I-0.

Create, insert or include as appendix the Annual building IAQ Performance Evaluation.

## Annual Evaluation and Reporting (4.10)

Facilities Operations Manager reviews the results of Indoor Environmental Quality management practices and highlights any issues needing resolutions. If, in the judgment of the Facilities Operations Manager, a severe or repeated complaint occurs, the Facilities Operations Manager will arrange for an investigation of the situation, and recommend corrective action if appropriate.

Annually, evaluate the following Systems Operations and Maintenance Practices in comparison to the Maintenance Plan portion of the Operations Commissioning Plan. Document findings and correct maintenance and operations practices, or update the Plan to reflect changes in practices.

• Site Systems

• Water Systems

• Energy Systems

• IEQ Systems

• Materials and Waste Systems

### Water Systems

Create, insert or include as appendix annual evaluations of the water systems, including any problems that were noted and their response.

### Energy Systems

Create, insert or include as appendix annual evaluations of the energy systems, including any problems that were noted and their response.

### IEQ Systems

Create, insert or include as appendix annual evaluations of the IEQ systems, including any problems that were noted and their response.

### Materials and Waste Systems

Create, insert or include as appendix annual evaluations of the materials and waste systems, including any problems that were noted and their response.

# Appendices

## Appendix: P-5b Operations Commissioning Matrix– Activities & Responsibilities

Insert B3 Guidelines v.2.2 Appendix P-5b – Operations Commissioning Matrix along with assigned Roles and Responsibilities to ensure that these requirements will be achieved.

## Other Appendices

Insert other appendices needed here.