SCHOOL BOARD ACTION REPORT

DATE: April 20, 2020
FROM: Denise Juneau, Superintendent
LEAD STAFF: Fred Podesta, Chief Operations Officer
206-252-0636, fhpodesta@seattleschools.org

For Introduction: May 27, 2020
For Action: June 10, 2020

1. TITLE

BTA IV/OSPI School Construction Assistance Program/Distressed Schools Grant: Resolution 2019/20-30: Acceptance of the Building Commissioning Report for the Magnolia Elementary School Renovation and Addition project

2. PURPOSE

The purpose of this action is to accept the building commissioning report for the Magnolia Elementary School Renovation and Addition project, in accordance with WAC 392-344-165, as required to complete the Office of Superintendent of Public Instruction (OSPI) Form D-11 Application to Release Retainage. Approval of the resolution meets identified requirements.

3. RECOMMENDED MOTION

I move that the School Board adopt Resolution 2019/20-30, accepting the building commissioning report for the Magnolia Elementary School Renovation and Addition project.

4. BACKGROUND INFORMATION

a. Background

Commissioning is a systematic process of documentation and verification to demonstrate that the building mechanical and electrical systems have been installed and function properly and efficiently and can be maintained to operate and satisfy the engineer's design intent and the district's operational requirements. The commissioning consultant, Engineering Economics, Inc., has satisfactorily completed the commissioning process.

The district's Capital Projects Mechanical/Electrical/Plumbing Coordinator, Mike McBee, was involved throughout the commissioning process. In addition, Mike Kennedy has also reviewed the installation and report findings and recommends the acceptance of this effort for the Magnolia Elementary School Renovation and Addition project located at 2418 28th Avenue West.

The Office of Superintendent of Public Instruction (OSPI), through the School Construction Assistance Program (SCAP), provides funding assistance to school districts that are undertaking a major new construction or modernization project. The primary documents that form the basis of any agreement between OSPI and the district are the

"D-form" documents. These documents, when properly completed and signed by all parties, form the official notices of agreement and intent on behalf of the district and OSPI.

As noted above, the acceptance of the commissioning report is required for Form D-11 for the release of construction retainage. Approval of this motion meets the requirements of OSPI to receive state funding assistance.

b. **Alternatives**

Not accepting this motion could put the district in a position subject to litigation and if state funding requirements are not met, the district will not receive state funding assistance that is available for this project. Therefore, this alternative is not recommended.

c. **Research**

- Office of Superintendent of Public Instruction, Form D-11 Application to Release Retainage
- Magnolia Elementary School Renovation and Addition Commissioning Report, Engineering Economics, Inc.

5. FISCAL IMPACT/REVENUE SOURCE

Action helps to secure approximately $2.43 million dollars in state funding assistance. This motion does not represent a specific expenditure.

Expenditure: ☐ One-time ☐ Annual ☐ Multi-Year ☒ N/A

Revenue: ☐ One-time ☐ Annual ☐ Multi-Year ☒ N/A

6. COMMUNITY ENGAGEMENT

With guidance from the District's Community Engagement tool, this action was determined to merit the following tier of community engagement:

☐ Not applicable

☐ Tier 1: Inform

☒ Tier 2: Consult/Involve

☐ Tier 3: Collaborate

The selection of projects in the BTA IV program went through an extensive community vetting process and ultimately received 72% approval from voters in February 2016.

7. EQUITY ANALYSIS

The selection of this project for consideration for the BTA IV and Distressed Schools Grant program was related to projected capacity shortfall. All Capital Projects are designed to provide equitable access to safe school facilities across the city.

8. STUDENT BENEFIT

It is the goal of the district to continue the process of implementing the BTA and BEX Capital Levy programs and provide students with safe and secure school buildings.

9. WHY BOARD ACTION IS NECESSARY

☐ Amount of contract initial value or contract amendment exceeds $250,000 (Policy No. 6220)

☐ Amount of grant exceeds $250,000 in a single fiscal year (Policy No. 6114)

☐ Adopting, amending, or repealing a Board policy

☐ Formally accepting the completion of a public works project and closing out the contract

☐ Legal requirement for the School Board to take action on this matter

☐ Board Policy No. _____, [TITLE], provides the Board shall approve this item

☒ Other: OSPI requires Board acceptance of this report.

10. POLICY IMPLICATION

School Board approval of the commissioning report is consistent with Board Policy No. 6100, Revenues from Local, State and Federal Sources, which states "It is the policy of the Seattle School Board to pursue systematically those funding opportunities that are consistent with district priorities from federal, state and other governmental units, as well as from private and foundation sources," and "The Board agrees to comply with all federal and state requirements that may be a condition for the receipt of federal or state funds…".

11. BOARD COMMITTEE RECOMMENDATION

This motion was discussed at the Operations Committee meeting on May 14, 2020. The Committee reviewed the motion and moved the item forward with a recommendation for approval by the full board.

12. TIMELINE FOR IMPLEMENTATION

Upon approval of this motion, the D-11 Application to Release Retainage will be completed and submitted to OSPI

13. ATTACHMENTS

- Resolution 2019/20-30 (for approval)
- Commissioning Completion Letter dated April 6, 2020 Engineering Economics, Inc. (for reference)
- Commissioning Report dated March 23, 2020 (Executive Summary attached for reference, the full report is available in the Capital Projects and Planning department)

Seattle School District #1
Board Resolution

Resolution No. 2019/20-30

A RESOLUTION of the Board of Directors of Seattle School District No. 1, King County, Seattle, Washington accepting the Building Commissioning Report by Engineering Economics, Inc. for the Funded BTA IV/School Construction Assistance Program/Distressed Schools Grant Program, Magnolia Elementary School Renovation and Addition as part of OSPI D-11 Application to Release Retainage.

WHEREAS, it has been determined that the commissioning report is complete and the building is operating as the commissioning report states; and

WHEREAS, there is no further action necessary by Engineering Economics, Inc. or the General Contractor for the Funded BTA IV/School Construction Assistance Program/Distressed Schools Grant Program, Magnolia Elementary School Renovation and Addition;

NOW THEREFORE, BE IT

RESOLVED, that the Seattle School Board of Directors, in accordance with the provisions in WAC 392-344-165, accepts the commissioning report by Engineering Economics, Inc. for the Funded BTA IV/School Construction Assistance Program/Distressed Schools Grant Program, Magnolia Elementary School Renovation and Addition project as part of the OSPI D-11 Application to Release Retainage; and

RESOLVED, that duly certified copies of this resolution shall be presented to the Office of Superintendent of Public Instruction.

ADOPTED this 10th day of June 2020

_____	_____
Zachary DeWolf, President	Chandra N. Hampson, Vice President
_____	_____
Leslie Harris, Member-at-Large	Brandon K. Hersey
_____	_____
Eden Mack	Liza Rankin
_____	ATTEST: _____
Lisa Rivera-Smith	Denise Juneau, Superintendent Secretary, Board of Directors Seattle School District No. 1 King County, WA

Commissioning Completion Letter

Magnolia Elementary School

Seattle Public Schools is committed to making its online information accessible and usable to all people, regardless of ability or technology. Meeting web accessibility guidelines and standards is an ongoing process that we are consistently working to improve.

While Seattle Public Schools endeavors to only post documents optimized for accessibility, due to the nature and complexity of some documents, an accessible version of the document may not be available. In these limited circumstances, the District will provide equally effective alternate access.

For questions and more information about this document, please contact the following:

Capital Projects
ziyang@seattleschools.org

Commissioning Completion Letter dated April 6, 2020 from Engineering Economics, Inc. for Magnolia Elementary School Renovation.

Engineering Economics Inc

1201 Western Avenue Suite 325
Seattle, Washington 98101

Telephone : **206 622 1001**
Facsimile : 206 622 5747

Memorandum

Date: April 6, 2020

To: Jeanette Imanishi, Seattle Public Schools
2445 3rd Ave South
Seattle, Washington 98134

From: David Hoffman, Engineering Economics Inc

Subject: Magnolia Elementary School Renovation
Commissioning Completion
EEI Project No.: 03-17009

Dear Jeanette,

EEI has been in the process of performing building commissioning for the Magnolia ES Renovation project since April 2016. We completed field functional testing for commissioned systems in December 2019, and we recently reviewed contractor resolution of the final commissioning issue log items for the project, which shows that all known issues have been resolved. This letter is being transmitted along with the executive summary of the project final commissioning report.

Acceptance testing based on analysis of trend data has been completed for all systems, though by agreement with SPS, EEI plans to conduct limited additional verification testing of the facility irrigation system once the system is de-winterized in May or June of 2020. EEI plans to transmit a field report summarizing findings of this testing once complete.

At this point of the project EEI recommends that Seattle Public Schools accept all the commissioned building systems, including HVAC, domestic water, lighting controls, and the building automation system.

If there are any further questions or concern please let me know.

Sincerely,

David A. Hoffman

David Hoffman, PE

Commissioning Report Executive Summary

Magnolia Elementary School

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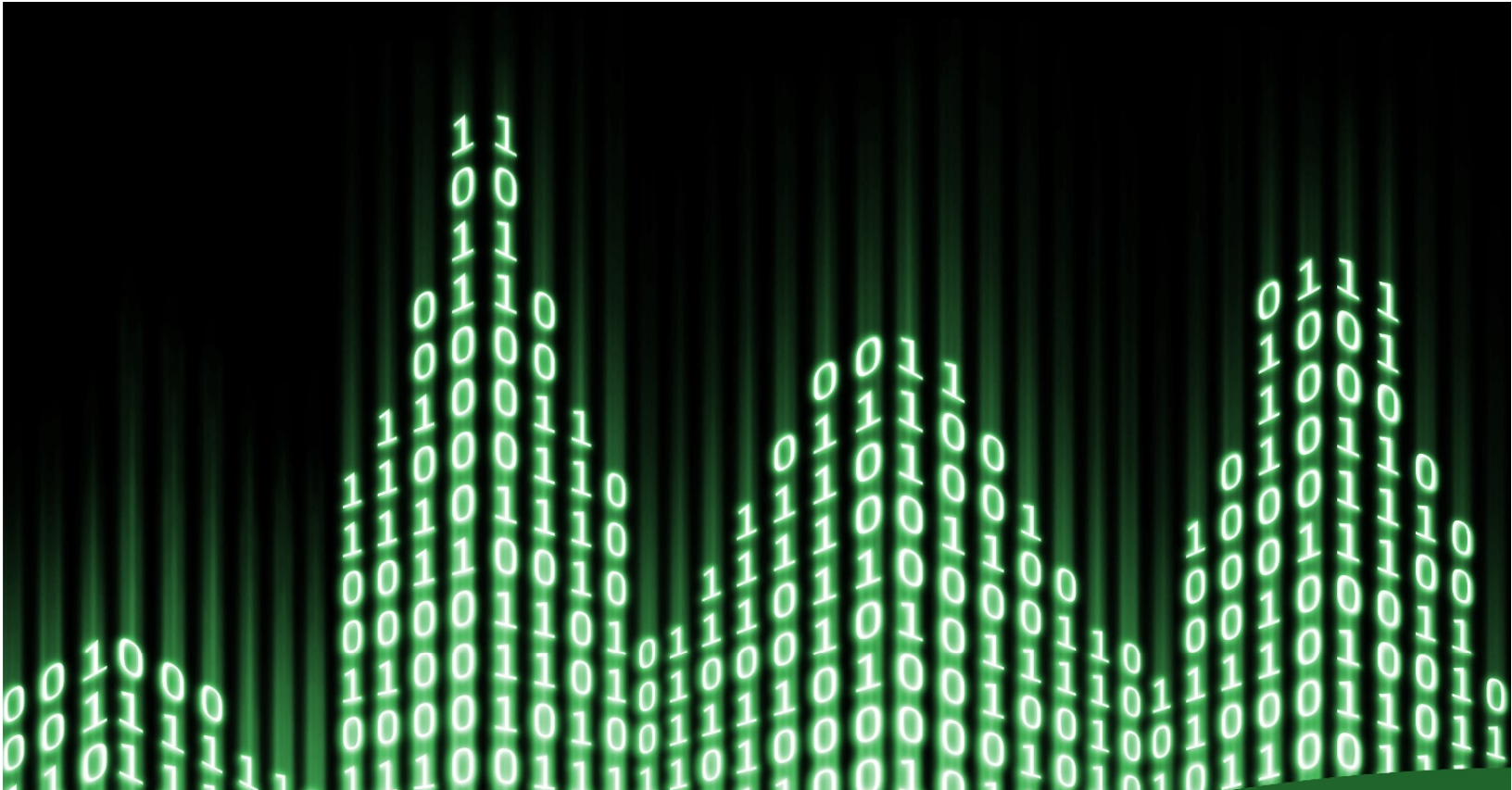
Capital Projects
ziyang@seattleschools.org

Commissioning Report dated March 23, 2020 from Engineering Economics, Inc. for Magnolia Elementary School Renovation.



Final Commissioning Report

Magnolia Elementary School Renovation
Seattle, WA

March 23, 2020
Rev 1.1

EEI Project #03-17009

Engineering Economics, Inc.

1201 Western Avenue, Suite 325
Seattle, Washington 98101
206.622.1001

Engineering Economics, Inc.
780 Simms Street, Suite 210
Golden, Colorado 80401
(303) 239-8700

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LIST OF ABBREVIATIONS

APPENDICES

LIST OF ABBREVIATIONS

A/E	Architect/Engineer
AFMS	Air Flow Measuring Station
AHU	Air Handling Unit
B	Boiler
BAS	Building Automation System
BMS	Building Management System
BoD	Basis of Design
Cx	Commissioning
CH	Chiller
CHW	Chilled Water
CW	Condenser Water
CFM	Cubic Feet Per Minute
CT	Cooling Tower
CUH	Cabinet Unit Heater
DAT	Discharge Air Temperature
°F or Deg. F	Degrees Fahrenheit
DHW	Domestic Hot Water
dP	Differential Pressure
EEI	Engineering Economics, Inc.
EF	Exhaust Fan
FCU	Fan Coil Unit
GPM	Gallons Per Minute
HEX	Heat Exchanger
HVAC	Heating, ventilating and air conditioning
HW	Hot Water
HHW	Heating Hot Water
In.W.C.or “w.c.	Inches of Water Column
MAT	Mixed Air Temperature
MUA or MAU	Make-up Air Unit
MEP	Mechanical, Electrical and Plumbing
O&M	Operations and Maintenance
OA	Outside Air
OAT	Outside Air Temperature
OPR	Owner’s Project Requirements
PSI	Pounds per Square Inch
RAT	Return Air Temperature
RHC	Reheat Coil
RH	Relative Humidity
RF	Return Fan
SF	Supply Fan
TAB	Test, Adjust and Balance
UH	Unit Heater
UV	Unit Ventilator
VAV	Variable Air Volume
VFD	Variable Frequency Drive

I. PROJECT DESCRIPTION

Seattle Public Schools (SPS) renovated an existing two-story 37,000 square foot (SF) historic school building, and added a new-construction 20,900 SF building addition, for a total project building area of approximately 58,000 SF. The project scope included complete mechanical, electrical and plumbing retrofit.

A central heating water plant with two gas-fired boilers and three variable-primary distribution pumps provides building heating via airside heating coils and convective heaters. Panel radiators serve hallways, with electric unit heaters located in various equipment storage rooms. Eight air handlers are furnished with ECM fan motors. Five of the units include outside air economizer cooling and serve library, admin, music, gym and commons (cafeteria) spaces, while three of the units are constant volume direct outside air supply (DOAS) serving typical classroom ventilation requirements. Three flat plate heat exchangers temper winter and summer entering outside air via energy exchange with exhaust and relief air. Six VAV air terminals provide economizer cooling to rooms in the Administrative area. Nine blower coil units with ECM fan motors, two of which have economizer cooling, serve hallway and miscellaneous spaces. Various exhaust fans serve the kitchen, restrooms, and other spaces.

The building does not have mechanical cooling, with the exception of four split air conditioners serving equipment rooms. Classrooms have operable windows with fin tube hydronic heating and ceiling fans. Three gas-fired domestic water heaters with recirculating pumps serve domestic hot water needs.

Lighting controls are simple local wall switch relay packs with occupancy sensors for classrooms, common areas, and 1/3 of hallway fixtures, with zone contactors connected to the BAS for zone schedule control of 2/3 of fixtures in hallways, all fixtures in the Commons/cafeteria space, and all exterior lights. Daylight harvesting photocells are provided where required by energy code. Emergency lights are served by local batteries. A portion of classroom and office receptacles are schedule controlled on/off by the BAS.

II. EXECUTIVE SUMMARY

This Final Commissioning Report contains an overview of the Cx process and results of the Cx program for Magnolia Elementary School. Prominent among the Cx services provided was the witnessing of functional testing for all heating/cooling/ventilation equipment, domestic hot water and lighting control. This report was prepared, in part, to fulfill prerequisite requirements. The commissioning authority lead for this project was David Hoffman, PE, CxA whose engineering degree, registration as a licensed professional mechanical engineer in the State of Washington, and certification as a Certified Commissioning Authority by AABC Commissioning Group qualifies him to supervise the commissioning process per the Seattle Energy Code C408.1 requirements. Engineering Economics Inc has a direct contractual relationship with the building Owner (Seattle Public Schools) and does not have a conflict of interest on this project per SEC C408.1.1

A. Conclusions

Installation and operation of commissioned equipment is consistent with applicable contract documents and meets the intent of the Basis of Design and Owner's Project Requirements. EEI did not validate equipment or items described in the BoD or OPR for non-commissioned equipment.

B. Commissioning (Cx) Timeline

OPR/BoD	Mar 2016
Design Development Review	Jun 2016
Construction Document Review	Nov 2016
Cx Specifications Submitted to A/E	Mar 2017
MEP Systems Start-up	Mar-Jun 2019
Testing, Adjusting & Balancing	Jun-Oct 2019
Functional Testing	Jun-Nov 2019
100% Outside Air Flush	Aug-Sep 2019
Operator Training – Contractor Provided	Aug 2019
Post Occupancy Testing and Review	Sep 2019
10-Month Warranty Review Meeting	Spring 2020

C. Outstanding Issues & Recommendations

There are no outstanding items on the issues resolution log at the time of this final report, out of a total of 159 issues discovered during commissioning. Please see Appendix G for a complete list of the issues on the resolution log.

D. Observations & Summary of Major Issues

Specific items identified during commissioning and resolved by the team include:

1. Boiler Low Gas Pressure Lockout – Both heating boilers experienced safety shutdowns and were unable to operate due to low gas pressure conditions that were eventually traced to a plugged gas sub-meter. When replaced by a pipe spool piece, the boilers were able to successfully operate. The mechanical contractor is working with a vendor to select a different meter for this application to provide a permanent solution (see Cx log item 46).

2. AHU-02 Tripping on Pressure Safety - The air handler serving the library was intermittently tripping on a return fan high pressure safety which required a manual unit reset. Troubleshooting indicated the problem was occurring during shutdown sequencing, which was revised to begin fan shutdowns at an earlier point in the overall unit shutdown sequencing. The issue was not observed to recur in subsequent operations.

3. Lockdown Mode – The access control system and associated lockdown mode initiated through wall pushbuttons in the main office area had various significant deficiencies in door locking hardware functionality and software configuration that resulted in unsuccessful lockdown mode during multiple tests. Eventually, with significant troubleshooting by the general and electrical contractors and the system vendor technician, the lockdown mode was successfully tested. See the Cx issue log for details.

E. Commissioning (Cx) Process Benefits

The Cx process for Magnolia ES was challenging due mainly to tight schedule constraints, as well as issues with the vendor engineering of the building automation system wiring and configuration, but we believe ultimately that project commissioning was successful. The Cx process identified a number of concerns regarding the commissioned equipment. These concerns, identified in Section 4 of this report, were brought to the attention of the design and

construction team through written reports. For each item, an observation and recommendation was prepared. The design and construction teams worked together to address and resolve issues when they were identified.

Benefits delivered to the Seattle School District by EEI include increased occupant comfort, a higher level of confidence that building equipment and controls are operating correctly, and increased energy savings compared to a similar project without successful commissioning.

III. DESIGN PHASE ACTIVITIES

A. Design Development Review

1. Plans and specifications dated: DD Set 05/06/2016

2. Representative Comments:

   a. M0.03 Schedules – Haakon as BOD for air handlers are very high quality units, recently commissioned at Genesee Hill ES, note MAFNA air handlers are TT Minor School project also may be higher quality than Trane or York. What is the ROM percent cost increase from Trane to Haakon?

   b. OPR 8.1 Performance Criteria – Note indicates that optional energy dashboard is required, does this mean a physical screen on site or a web site versus typical BAS energy meter screen?

3. A/E Responses to EEI Comments:

   a. Response came in form of team discussion at Cx review meeting.

   b. Response came in form of team discussion at Cx review meeting.

B. Construction Document Review

1. Plans and specifications dated: DD Backcheck Set 7/29/2016

2. Representative Comments:

   a. Mech Dwgs General – Classrooms show high displacement diffusers with exterior wall fin tube heaters. I haven't seen this combination before, understand Washington ES in Tacoma has similar system and satisfied occupants. We did commission low, corner-installed displacement diffusers at South Shore K-8 which seemed to work well, were these type of diffusers considered?

   b. OPR MEP Standards – Controls – Approved manufacturers include JCI and Siemens as the standard for many years, but also a statement that "Additional manufacturer's hardware subject to pending RFQ". Is SPS planning to allow a third manufacturer to bid?

3. A/E Responses to EEI Comments

   a. Response came in form of team discussion at Cx review meeting.

   b. Response came in form of team discussion at Cx review meeting.

IV. CONSTRUCTION PHASE ACTIVITIES

A. Submittal Review Process:

Submittals for commissioned systems were reviewed for compliance from January to July of 2018, and review comments were distributed to the Cx team via PCR. See Appendix C for all design review documents.

B. Commissioning (Cx) Planning

A construction phase commissioning plan was developed and implemented for the project. Refer to a copy of the document in Appendix D.

C. Job Site Observation

The commissioning team made site walks during construction. Some of the site walks were to make observations about potential issues while others were to check site conditions for equipment start up (see Appendix G).

D. History of Deficiencies and Resolution

See the Cx Issue Resolution Log found in Appendix G for complete information regarding the history and resolution of issues discovered during field testing.

V. ACCEPTANCE PHASE ACTIVITIES

A. Pre-functional Tests

As part of the field commissioning process, prior to executing functional tests for any given commissioned system, EEI reviewed for completeness all relevant pre-functional and startup documentation completed by subcontractors, vendors, and manufacturers.

B. Functional Performance Tests

EEI developed and observed execution of functional tests for all commissioned systems. See Appendix I for detailed results of testing.

C. Building Systems Performance

Extensive discussion of building system performance test results and evaluation are included in the notes for functional performance test reports (see Appendix I), as well as in the descriptions, recommendations, and notes for items included on the Cx Issue Resolution Log (see Appendix G).

VI. CLOSE-OUT ACTIVITIES

A. O&M Manual Documentation Review

The general contractor provided preliminary O&M documentation in June 2019, with final documentation provided by August 2019. We have reviewed the submittal for completeness from the commissioning perspective, and discussed with the Owner, who has expressed satisfaction with the submittal completeness for building commissioned systems.

B. Training Program Evaluation

EEI has verified that training sessions were coordinated between the Owner and general contractor and that training occurred in June 2019. The Owner has expressed satisfaction with the training provided for building commissioned systems. See Appendix J for a training summary matrix.

C. Systems Manual

EEI will create a Systems Manual, expected to be completed by December 2019. The Systems Manual is intended to be used by maintenance personnel as a supplement to the information contained in the O&M data. It includes the following information:

- System Description
- Operating set points
- Recommended schedule for retesting of commissioned system
- Recommended schedule for recalibration of sensors and actuators.

D. 10-Month Warranty Review Meeting

The meeting is intended to provide a forum to discuss any unresolved commissioning issues.

VII. POST OCCUPANCY REPORT AMENDMENT

Given that there were no known unresolved commissioning issues at the time of the completion of this report, SPS and EEI agreed that there was no need for a post-occupancy review meeting.