

Enhancing BUILDER Data Communication Through Power BI

Anna Sloan

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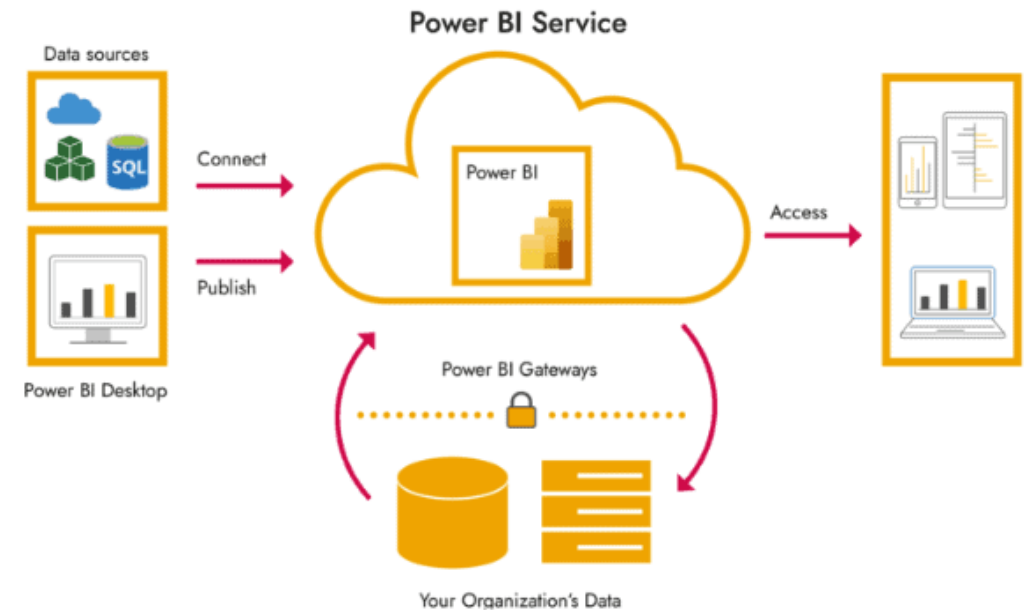
Anna Sloan

Agenda

- 01** What is Power BI?
- 02** Why introduce Power BI?
- 03** User Groups
- 04** Preliminary Report + Feedback
- 05** Final Report
- 06** Next Steps

What is Power BI?

- Data visualization platform
- Microsoft Product
- Cloud-based and Desktop-based data storage options



Why introduce Power BI?

- BUILDER reports lack a quick visual analysis component
- Ability to integrate with ESMS
- Customizable for specific client needs
- Free and low-cost versions

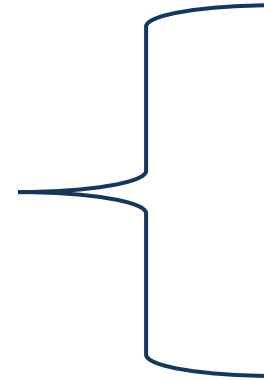
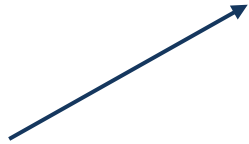
BUILDER Reports

Building Condition Index (BCI) Summary
Building Functionality Assessment Detail
Building Metrics Summary
Building Summary
Building System Condition Index (SCI) by System
Building Use Category Summary
Building Use Detail
CI Performance
Complex Condition Index Summary
Complex Detail
Condition Index Detail
Direct Condition Rating Inspection By Component
Direct Condition Rating Inspection By Sample Location
Direct Condition Rating Inspection By Section
Distress Survey Inspection Report By Component
Distress Survey Inspection Report By Sample Location
Distress Survey Inspection Report By Section
FCI Performance
FI Performance
Functional Area Detail
Functional Area Functionality Assessment Detail
Housing Details
Inspection History
Installation Status Report (ISR) Building Use Summary
Installation Status Report (ISR) Detail
Installation Status Report (ISR) Total Summary
Last Inspection Date Detail
Last Inspection Date Summary
Location Budget - Expensed and Backlog Cumulative
Location Budget - Expensed and Backlog Yearly
PI Performance
Remaining Service Life (RSL) Detail
Section Inventory Detail
Seismic Evaluation
Site Detail
Site Information Summary
System Inventory
Warranty Information Detail
Warranty Information Summary
Work Item Details
Work Item Summary by Activity
Work Items By Building
Work Plan Completions
Work Plan Detail By Year
Work Plan For Export To MS Excel
Work Plan Summary By Status

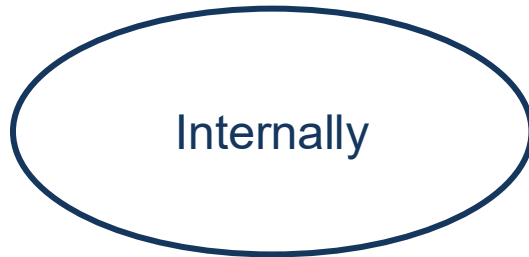
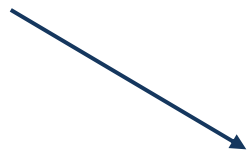


User Groups

Power BI



- Maintenance Tool
- Cost Analysis
- Visualization Platform
- Decision Making Tool



- QC Tool
- Data Analysis
- Planning Tool

Preliminary Dashboard

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Menu

- Slicer**
 - What are the statistics for one component, building, or site?
 - What are the statistics for one category code?
- Building Summary**
 - What are the percentages of federally vs state owned facilities per site?
 - What is the BCI vs FCI for each site?
- Work Item & Building Details**
 - How do inspection vs BUILDER Section CI ratings compare?
 - How do Section CI and the actual repair cost compare?
- Work Item Cost Breakdown**
 - What is the cost to fix all buildings within one site?
 - What is the cost to fix a particular building?
 - Which component type costs the most to replace?
- Pre- vs Post-Assessment Ratings**
 - How do the historical vs updated assessments compare?
 - Which components have changed the most over time?
- Glossary**
 - What does BCI, FCI, PRV, etc. mean?
 - What are the rules for BCI, FCI, and Section CI?

Menu ^x Slicer Building Summary Work Items & Building Detail Work Item Cost Breakdown Pre- vs Post-Assessment Ratings Glossary +

Preliminary Dashboard + Feedback

Site Name

Select all Pond Lake

Stream Ocean

River Gulf

Building Name

Select all Alpha

Beta Gamma

Delta Epsilon

Zeta Eta

Theta Iota

Kappa Lambda

Mu Nu

Xi Omicron

Pi Rho

Sigma Tau

Upsilon Phi

Chi Psi

Omega

Component System

Select all Superstructure

Conveying

Electrical

Equipment

Exterior Enclosure

Fire Protection

HVAC

Interior Construction

Interior Finishes

Plumbing

Roofing

Stairs

BCI Rating

Amber Red

Green

FCI Rating

Amber Red

Green

Section CI Rating

Amber Red

Green

Fiscal Year

2026

Category Code

All

How to:

Unselected

Selected

Menu Slicer x Building Summary Work Items & Building Detail Work Item Cost Breakdown Pre- vs Post-Assessment Ratings Glossary +

Final Dashboard

The dashboard features several filter sections:

- Site Name:** Select all, Pond, Lake, Stream, Ocean, River, Gulf.
- Building Name:** Select all, Alpha, Beta, Gamma, Delta, Epsilon, Zeta, Eta, Theta, Iota, Kappa, Lambda, Mu, Nu, Xi, Omicron, Pi, Rho, Sigma, Tau, Upsilon, Phi, Chi, Psi, Omega.
- Component System:** Select all, Interior Construction, Conveying, Interior Finishes, Electrical, Plumbing, Equipment, Roofing, Exterior Enclosure, Stairs, Fire Protection, Superstructure, HVAC.
- BCI Rating:** Amber, Red, Green.
- FCI Rating:** Amber, Red, Green.
- Section CI Rating:** Amber, Red, Green.
- Fiscal Year:** 2026.
- Category Code:** All (dropdown).

The **Component** section is highlighted with a red border and contains:

- Select all
- B2030 EXTERIOR DOORS
- B1020 ROOF CONSTRUCTION
- B3010 ROOF COVERINGS
- B2010 EXTERIOR WALLS
- C1010 PARTITIONS
- B2020 EXTERIOR WINDOWS
- C1020 INTERIOR DOORS

How to:

- = Unselected
- = Selected

Menu

Slicer ^x

Building Summary

Work Items & Building Detail

Work Item Cost Breakdown

Pre- vs Post-Assessment Ratings

Glossary



Final Dashboard w/ Selection

The dashboard features several filter sections:

- Site Name:** A grid with options: Select all, Pond (highlighted with a red box), Lake, Stream, Ocean, River, and Gulf.
- Building Name:** A grid of Greek letters: Alpha, Gamma, Epsilon, Eta, Iota, Lambda, Nu, Omicron, Rho, Tau, Phi, Psi, and Omega.
- Component System:** A grid of system categories: Interior Construction, Interior Finishes, Plumbing, Roofing, Stairs, Superstructure, and HVAC.
- Component:** A grid of specific components: B2030 EXTERIOR DOORS, B1020 ROOF CONSTRUCTION, B3010 ROOF COVERINGS, B2010 EXTERIOR WALLS, C1010 PARTITIONS, B2020 EXTERIOR WINDOWS, and C1020 INTERIOR DOORS.
- BCI Rating:** A vertical bar with Amber, Green, and Red segments.
- FCI Rating:** A vertical bar with Amber, Green, and Red segments.
- Section CI Rating:** A vertical bar with Amber, Green, and Red segments.
- Fiscal Year:** A dropdown menu currently set to 2026.
- Category Code:** A dropdown menu currently set to All.

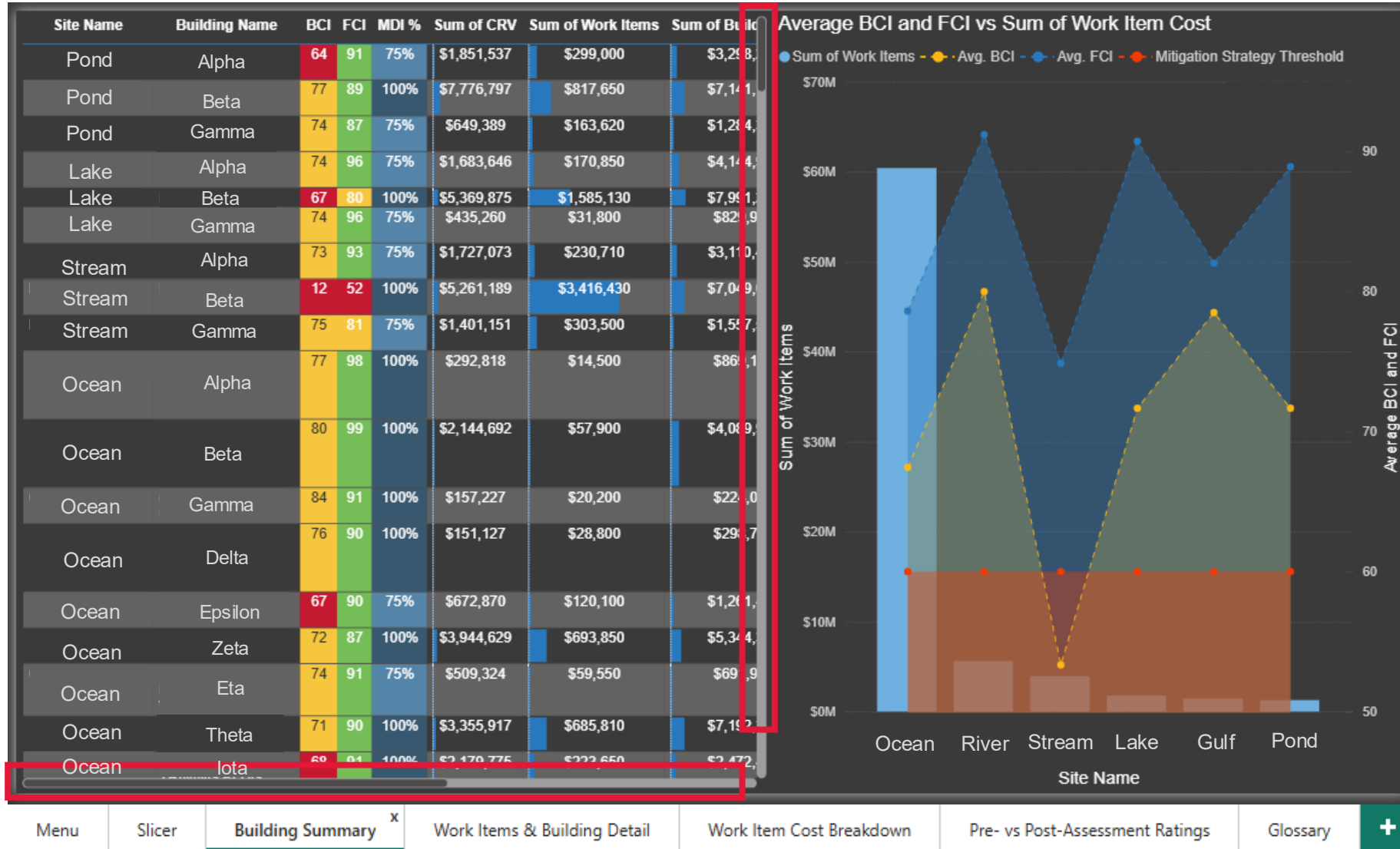
How to:

- = Unselected
- = Selected

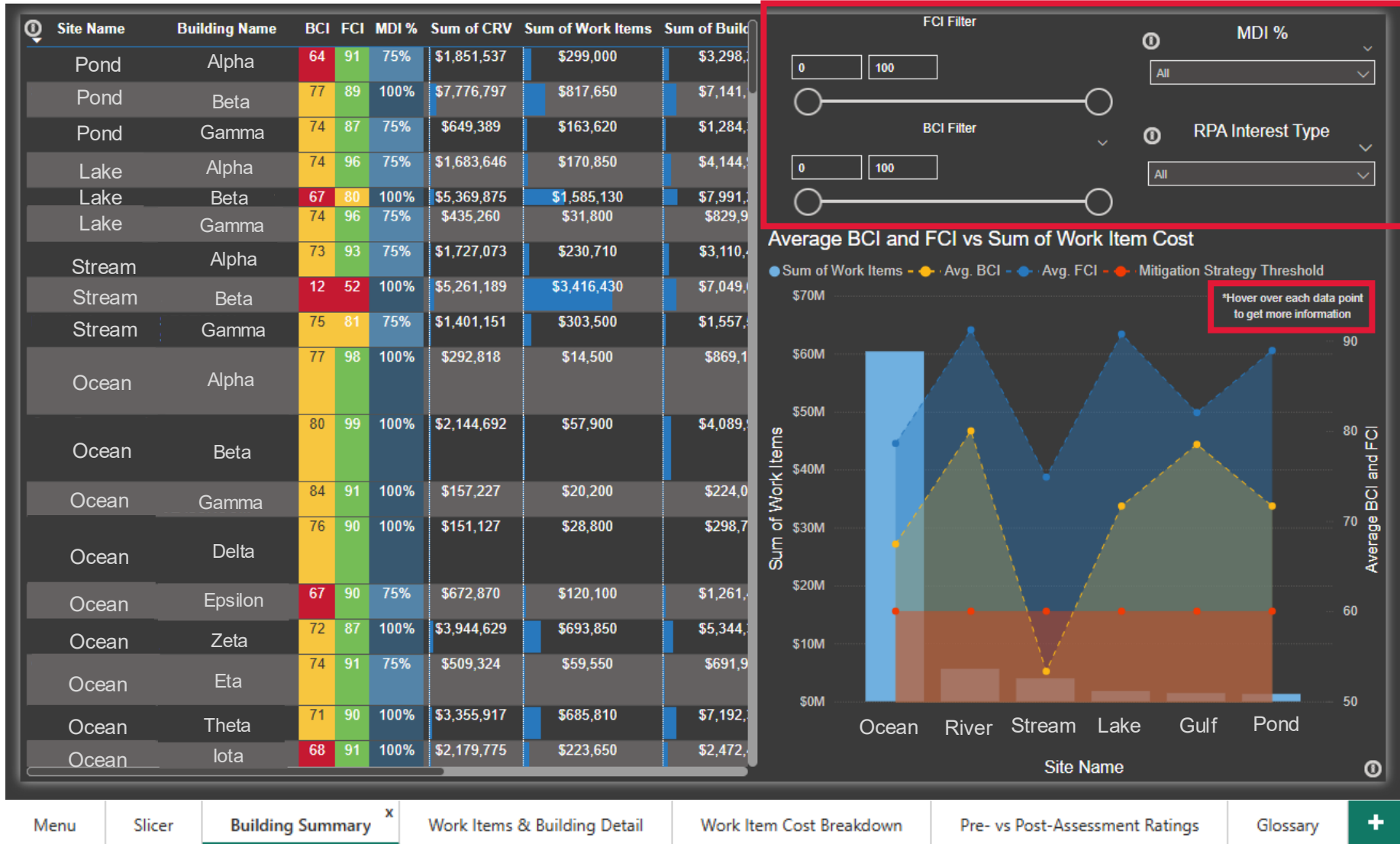
Navigation Menu:

- Menu
- Slicer ^x
- Building Summary
- Work Items & Building Detail
- Work Item Cost Breakdown
- Pre- vs Post-Assessment Ratings
- Glossary
- +

Preliminary Dashboard + Feedback



Final Dashboard



Final Dashboard

Site Name	Building Name	BCI	FCI	MDI %	Sum of CRV	Sum of Work Items	Sum of Build
Pond	Alpha	64	91	75%	\$1,851,537	\$299,000	\$3,298,
Pond	Beta	77	89	100%	\$7,776,797	\$817,650	\$7,141,
Pond	Gamma	74	87	75%	\$649,389	\$163,620	\$1,284,
Lake	Alpha	74	96	75%	\$1,683,646	\$170,850	\$4,144,
Lake	Beta	67	80	100%	\$5,369,875	\$1,585,130	\$7,991,
Lake	Gamma	74	96	75%	\$435,260	\$31,800	\$829,9
Stream	Alpha	73	93	75%	\$1,727,073	\$230,710	\$3,110,
Stream	Beta	12	52	100%	\$5,261,189	\$3,416,430	\$7,049,
Stream	Gamma	75	81	75%	\$1,401,151	\$303,500	\$1,557,
Ocean	Alpha	77	98	100%	\$292,818	\$14,500	\$869,1
Ocean	Beta	80	99	100%	\$2,144,692	\$57,900	\$4,089,
Ocean	Gamma	84	91	100%	\$157,227	\$20,200	\$224,0
Ocean	Delta	76	90	100%	\$151,127	\$28,800	\$298,7
Ocean	Epsilon	67	90	75%	\$672,870	\$120,100	\$1,261,
Ocean	Zeta	72	87	100%	\$3,944,629	\$693,850	\$5,344,
Ocean	Eta	74	91	75%	\$509,324	\$59,550	\$691,9
Ocean	Theta	71	90	100%	\$3,355,917	\$685,810	\$7,192,
Ocean	Iota	68	91	100%	\$2,179,775	\$223,650	\$2,472,

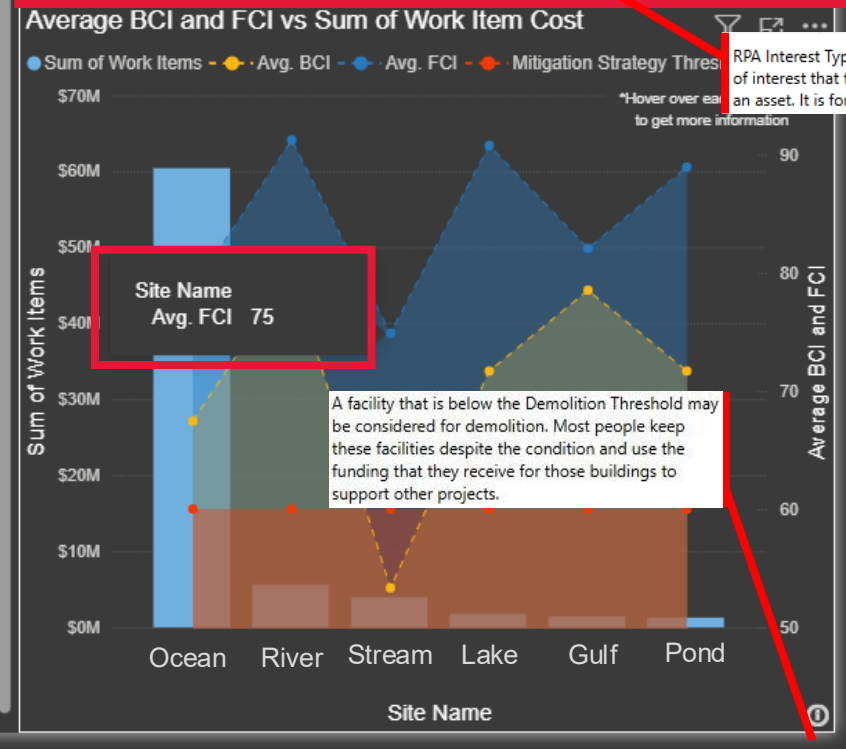
FCI Filter: 0 to 100

MDI %: All

BCI Filter: 0 to 100

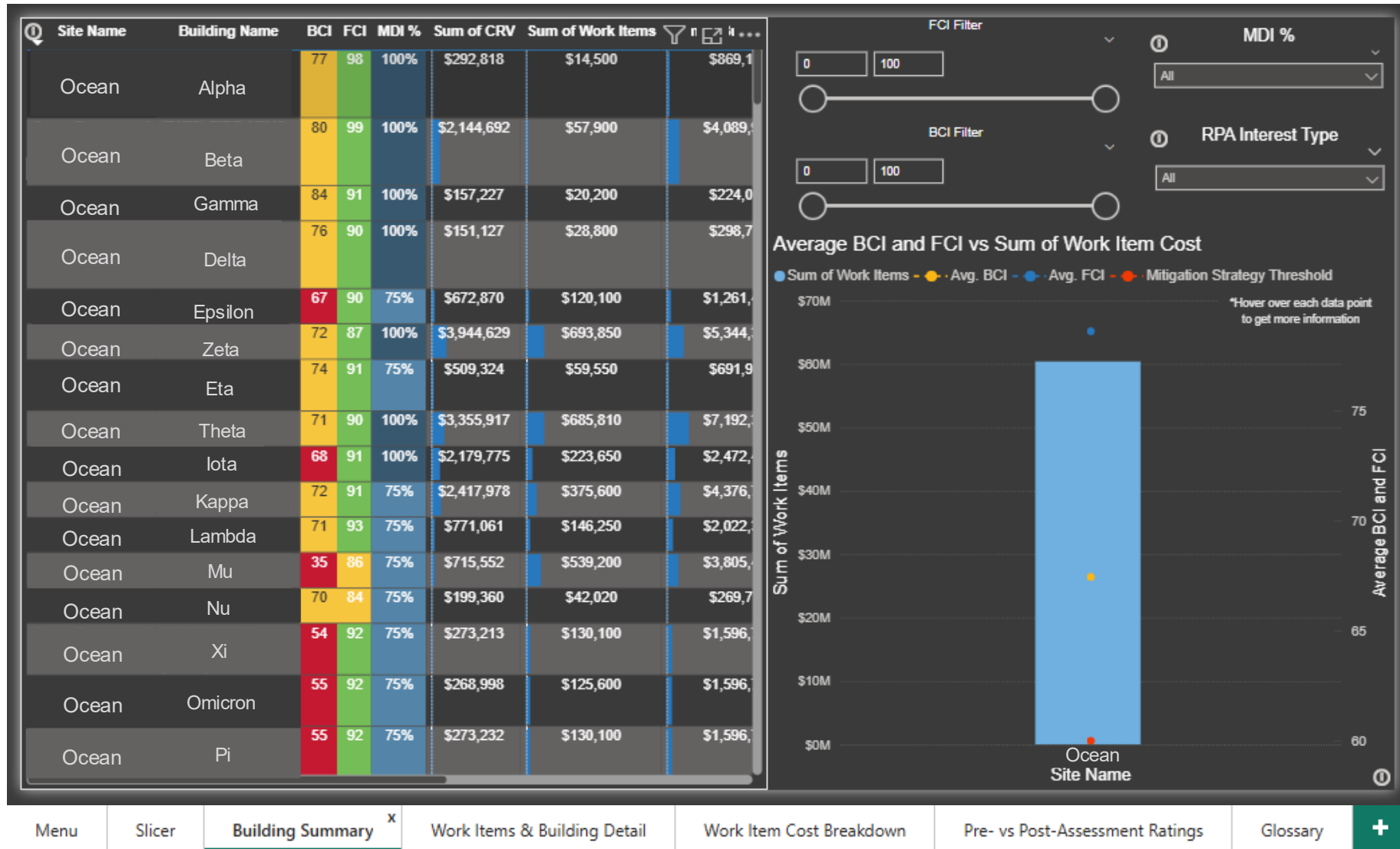
RPA Interest Type: All

The Mission Dependency Index (MDI) is a risk assessment used to link facility functions to their support military missions, helping to prioritize operations and management efforts.

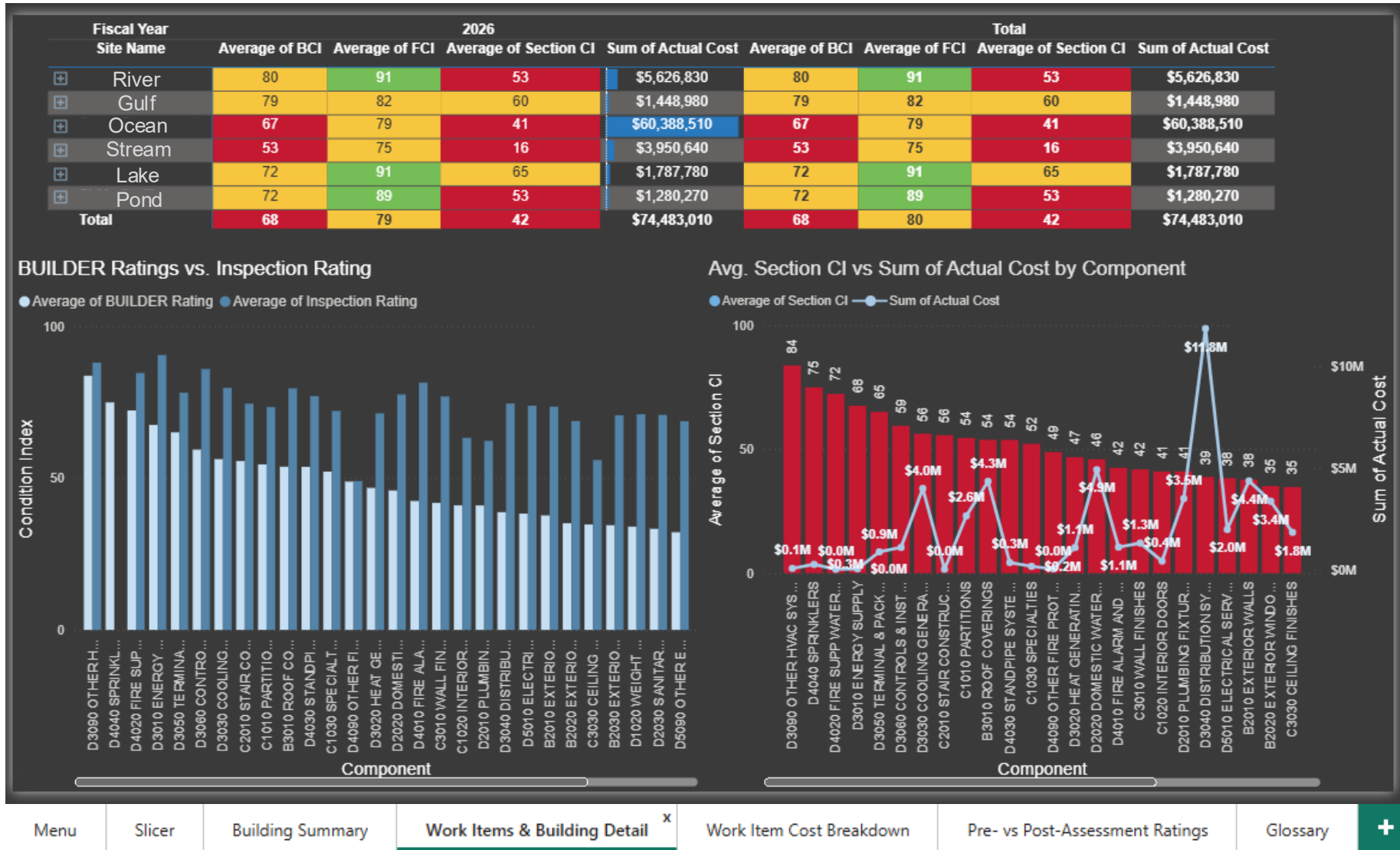


RPA Interest Type is the code that identifies the type of interest that the Department of Defense holds in an asset. It is for individual buildings.

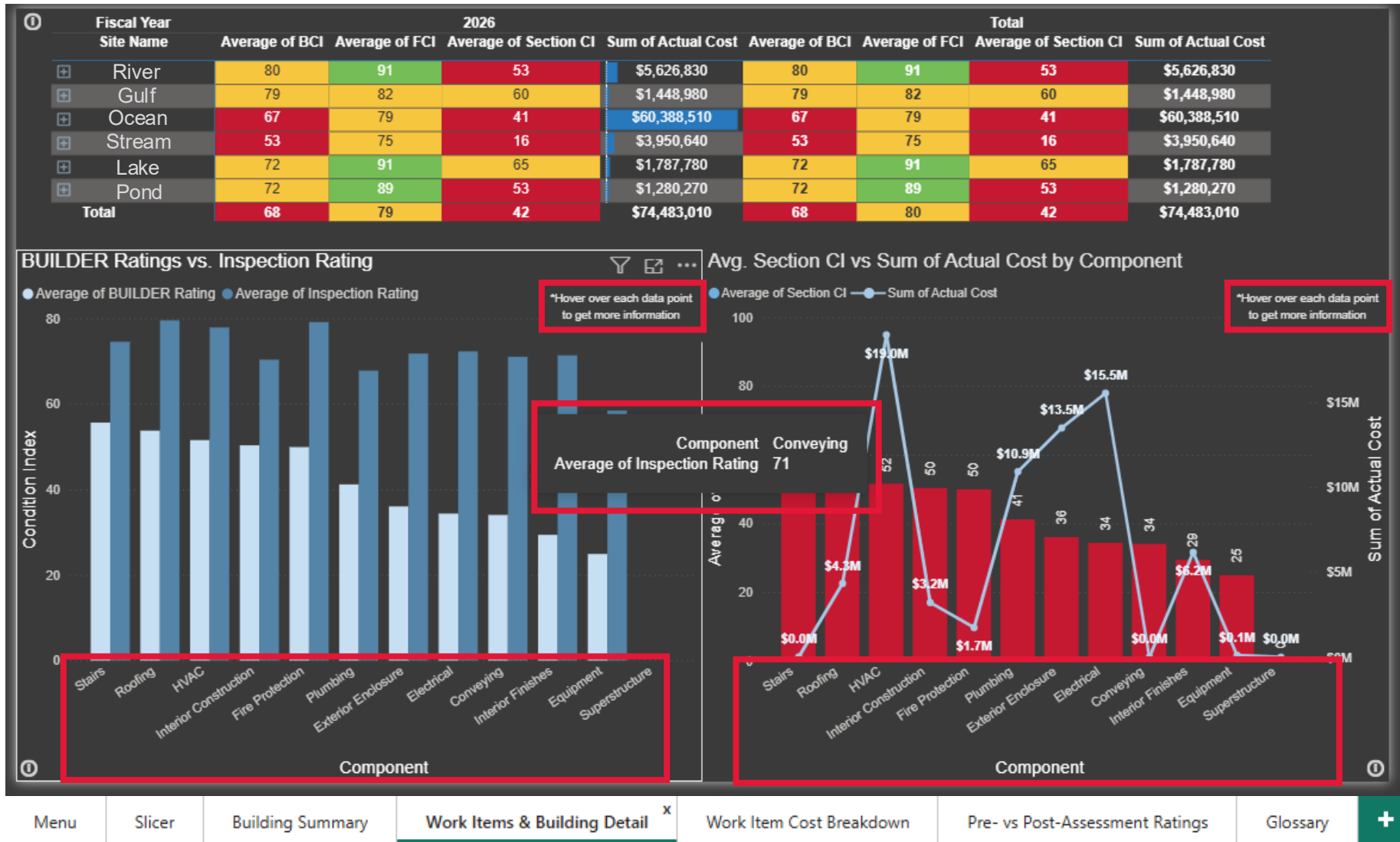
Final Dashboard w/ Selection



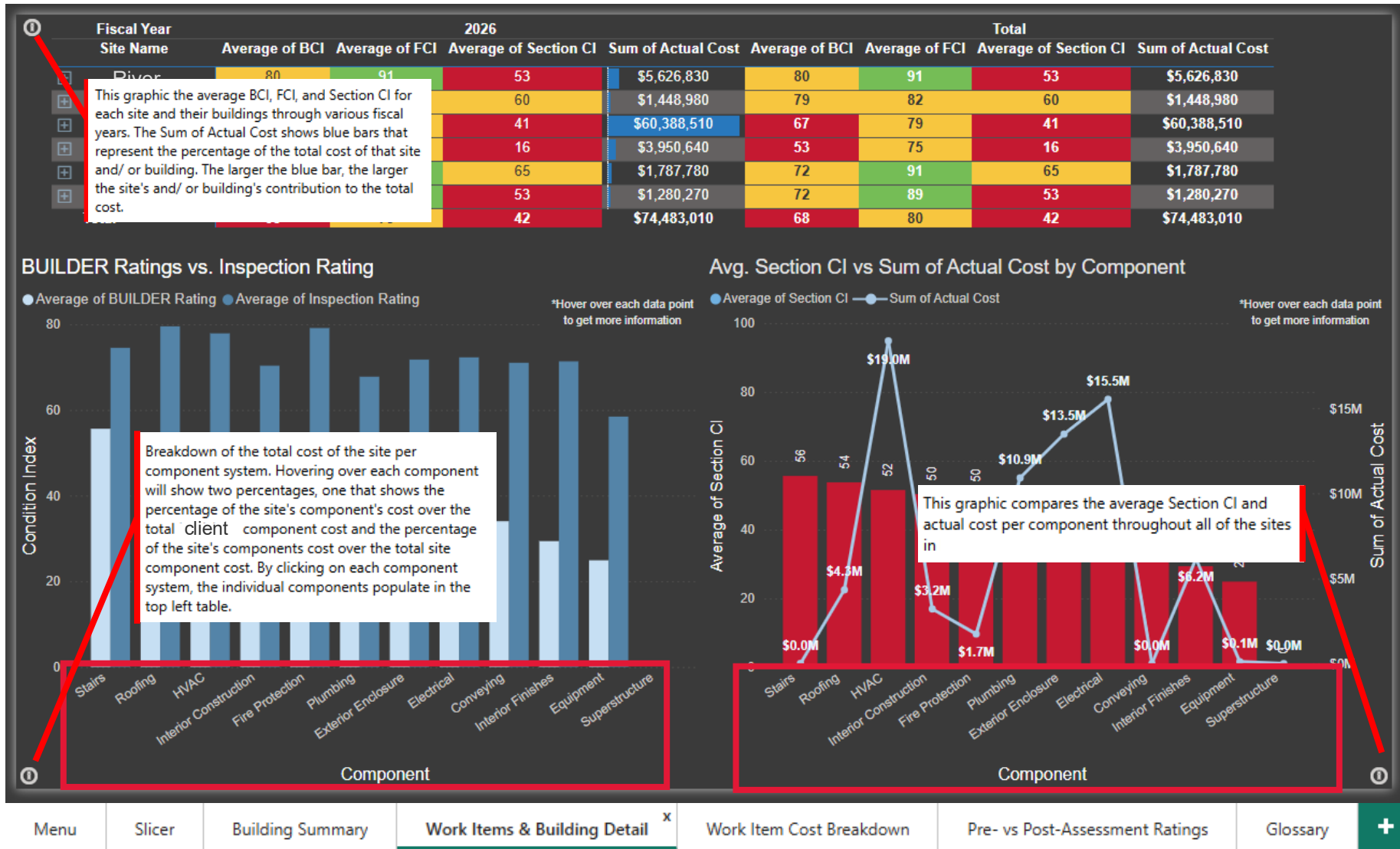
Preliminary Dashboard + Feedback



Final Dashboard

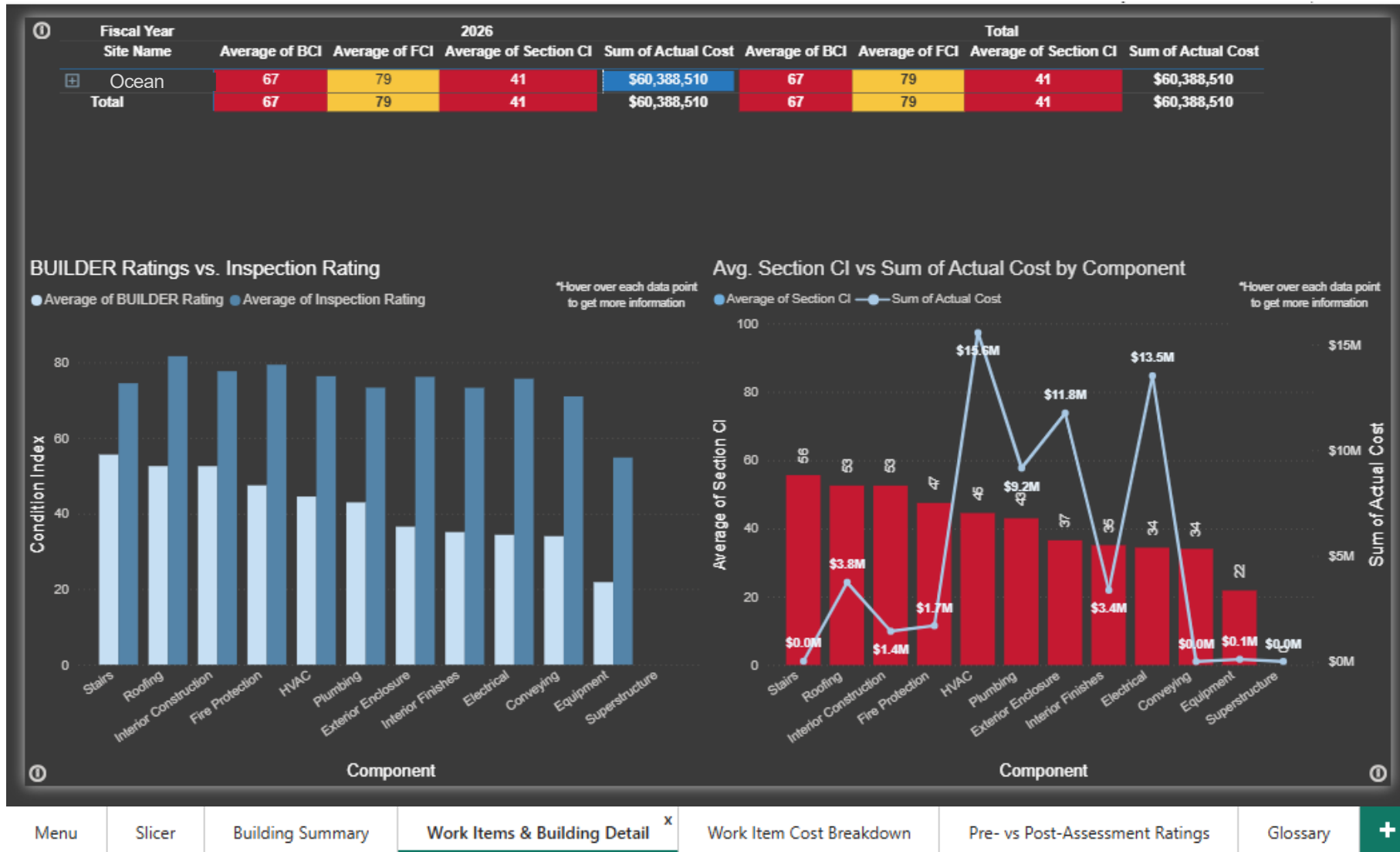


Final Dashboard

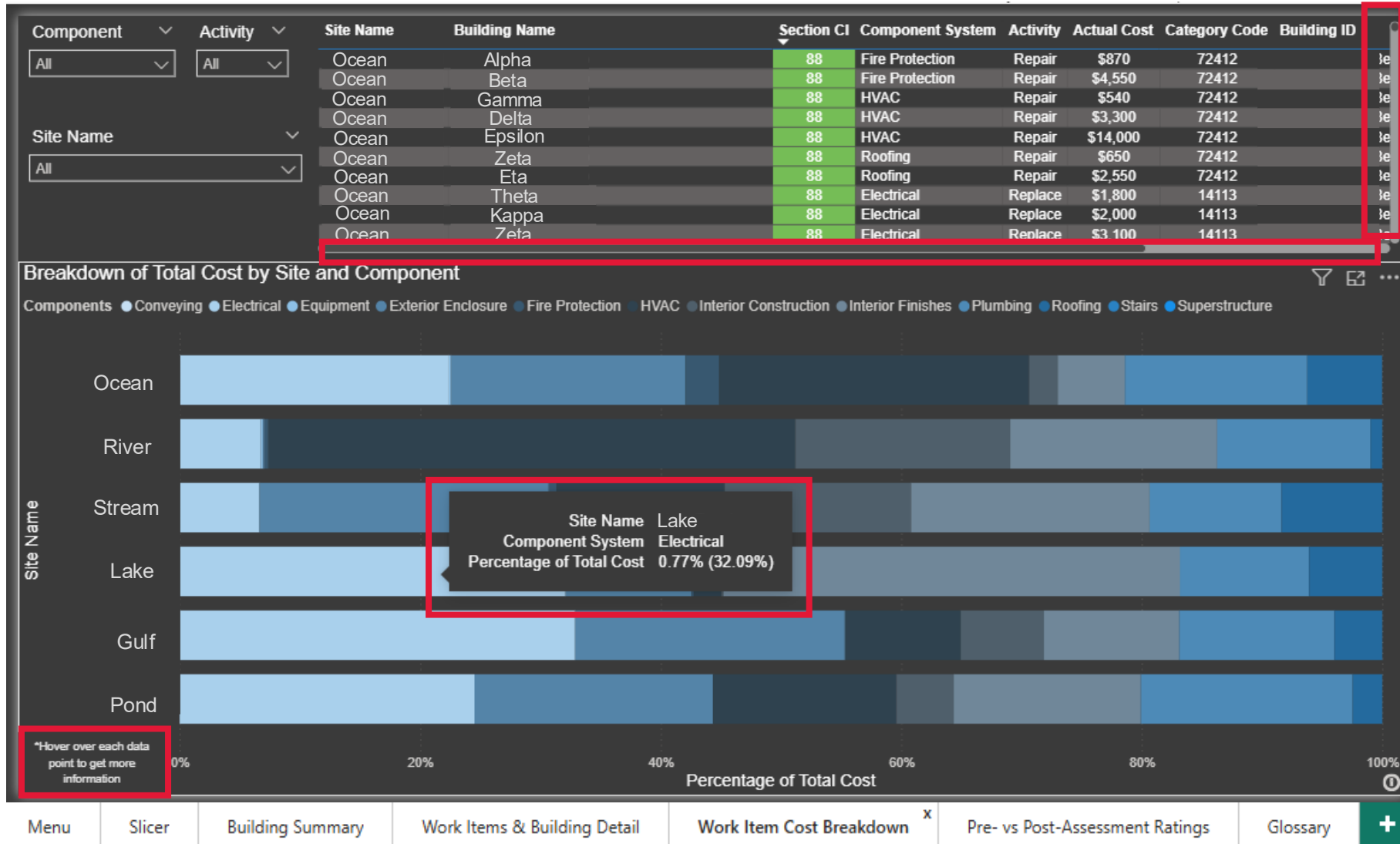


Decreased the number of bars in the graph

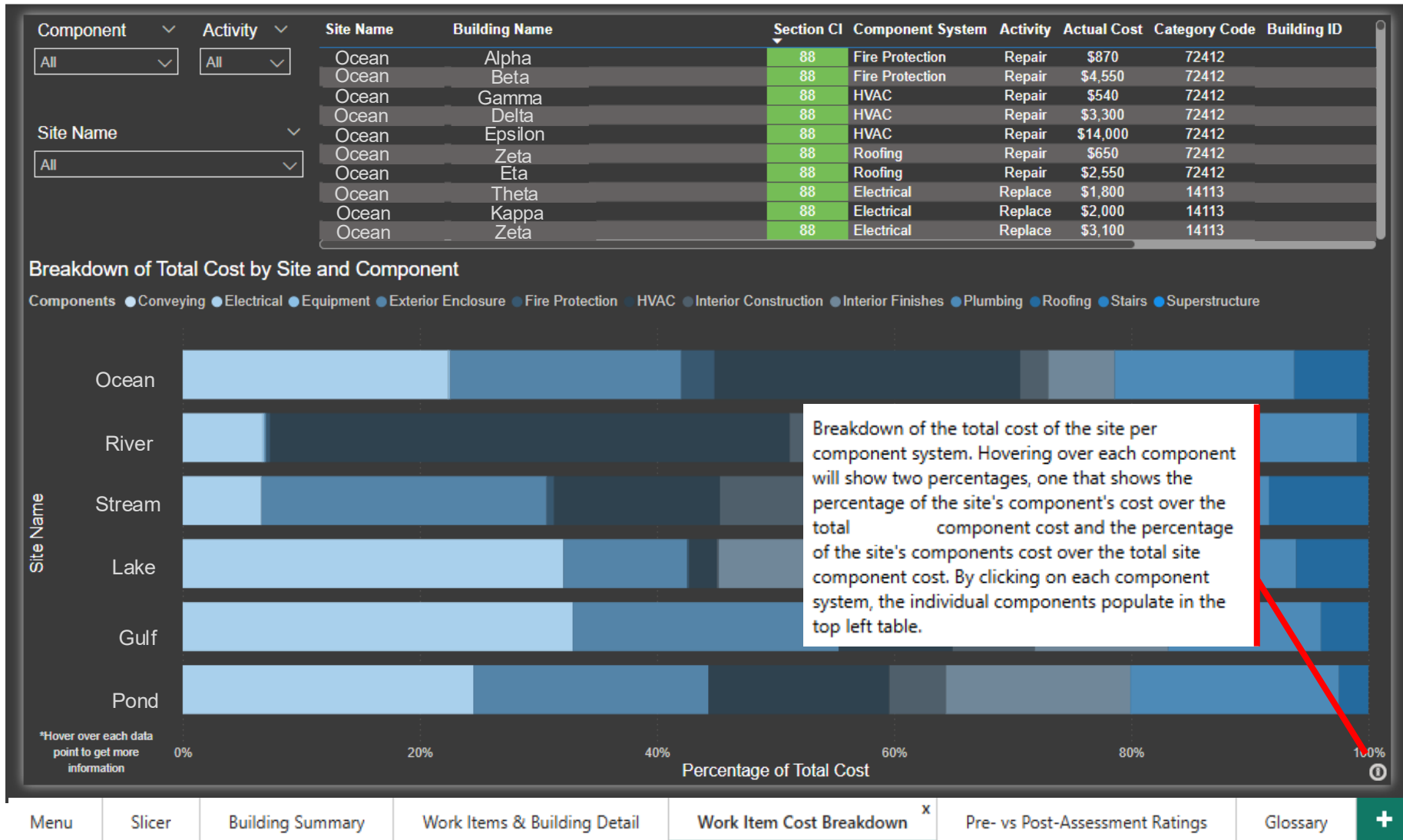
Final Dashboard w/ Selection



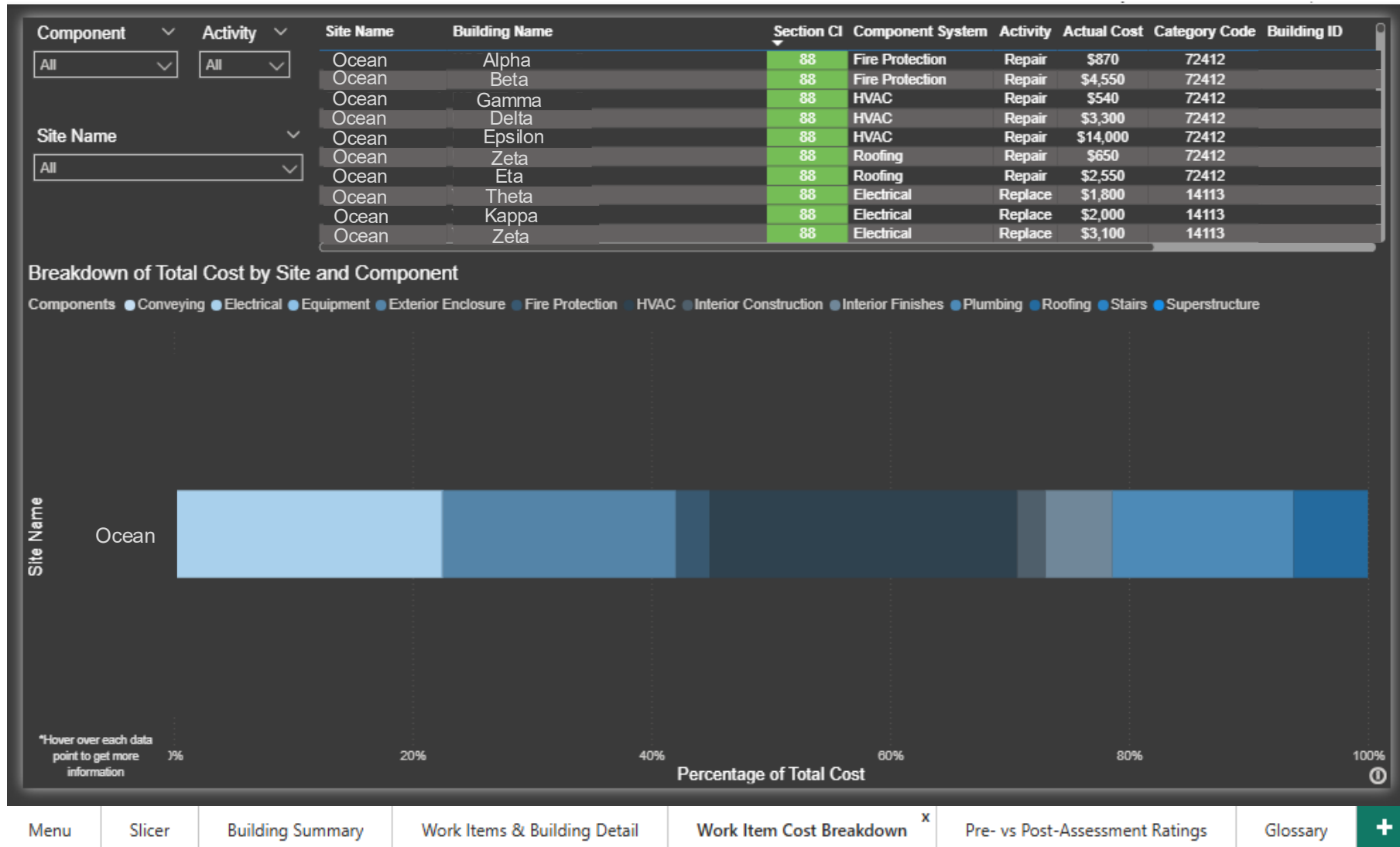
Final Dashboard



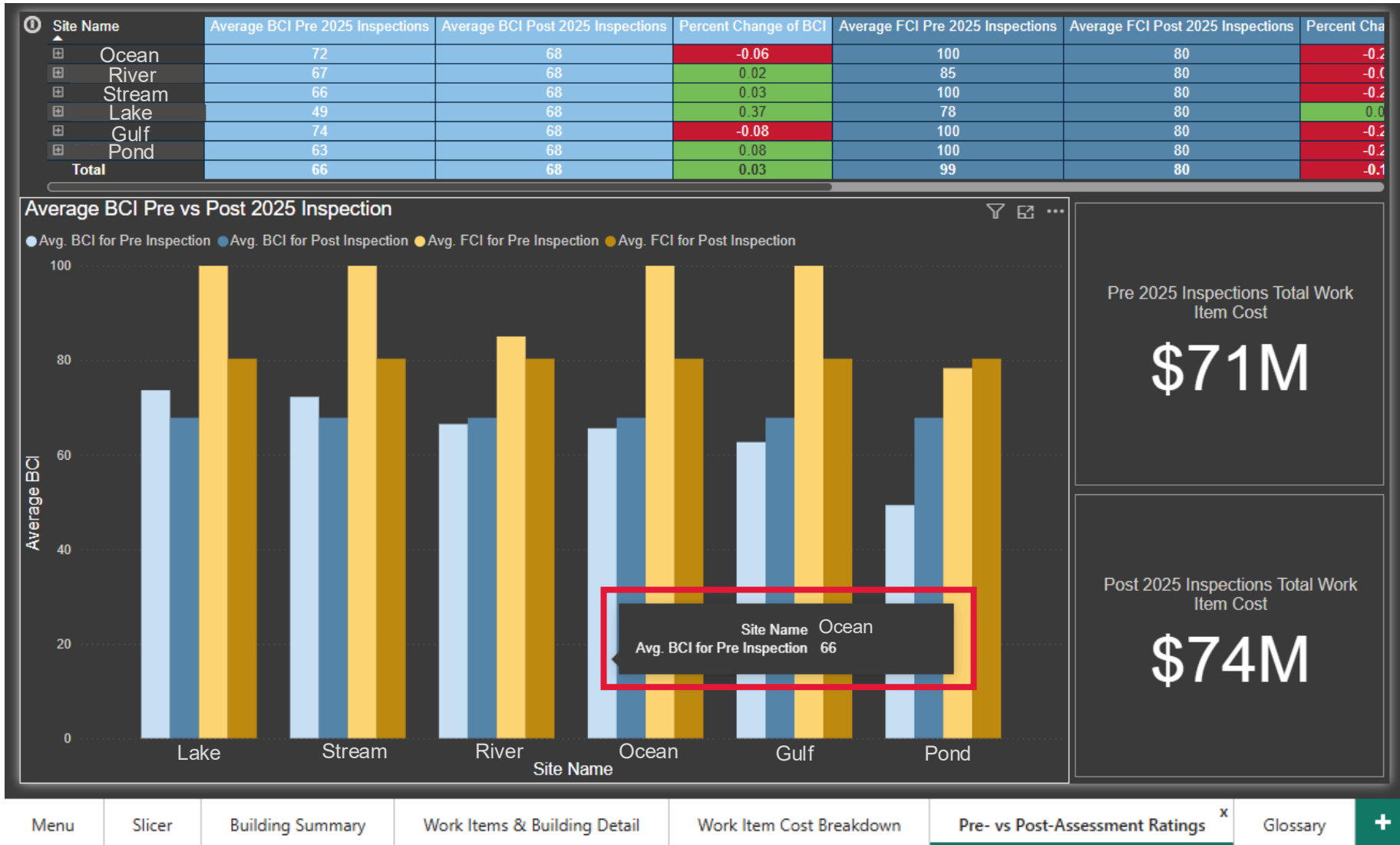
Final Dashboard



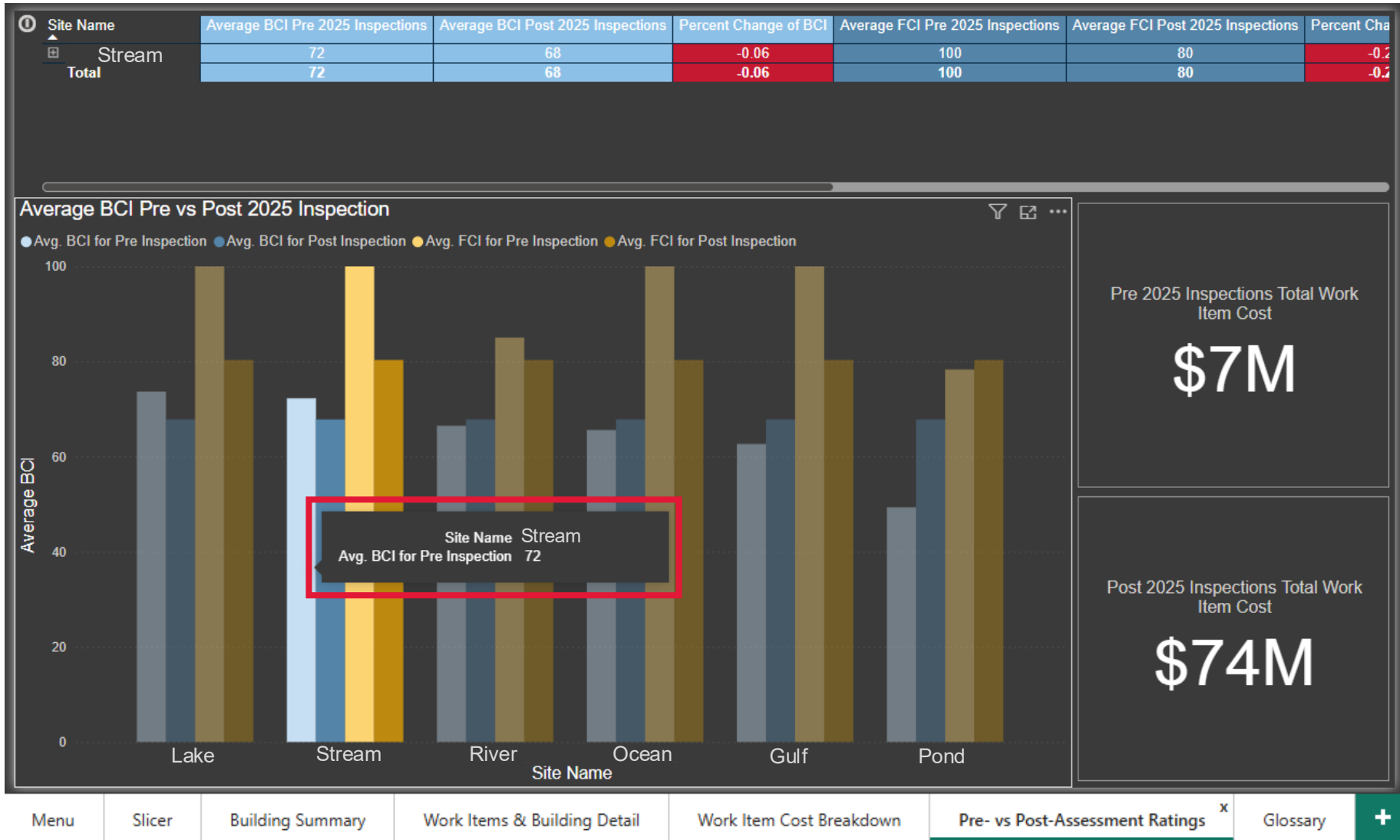
Final Dashboard w/ Selection



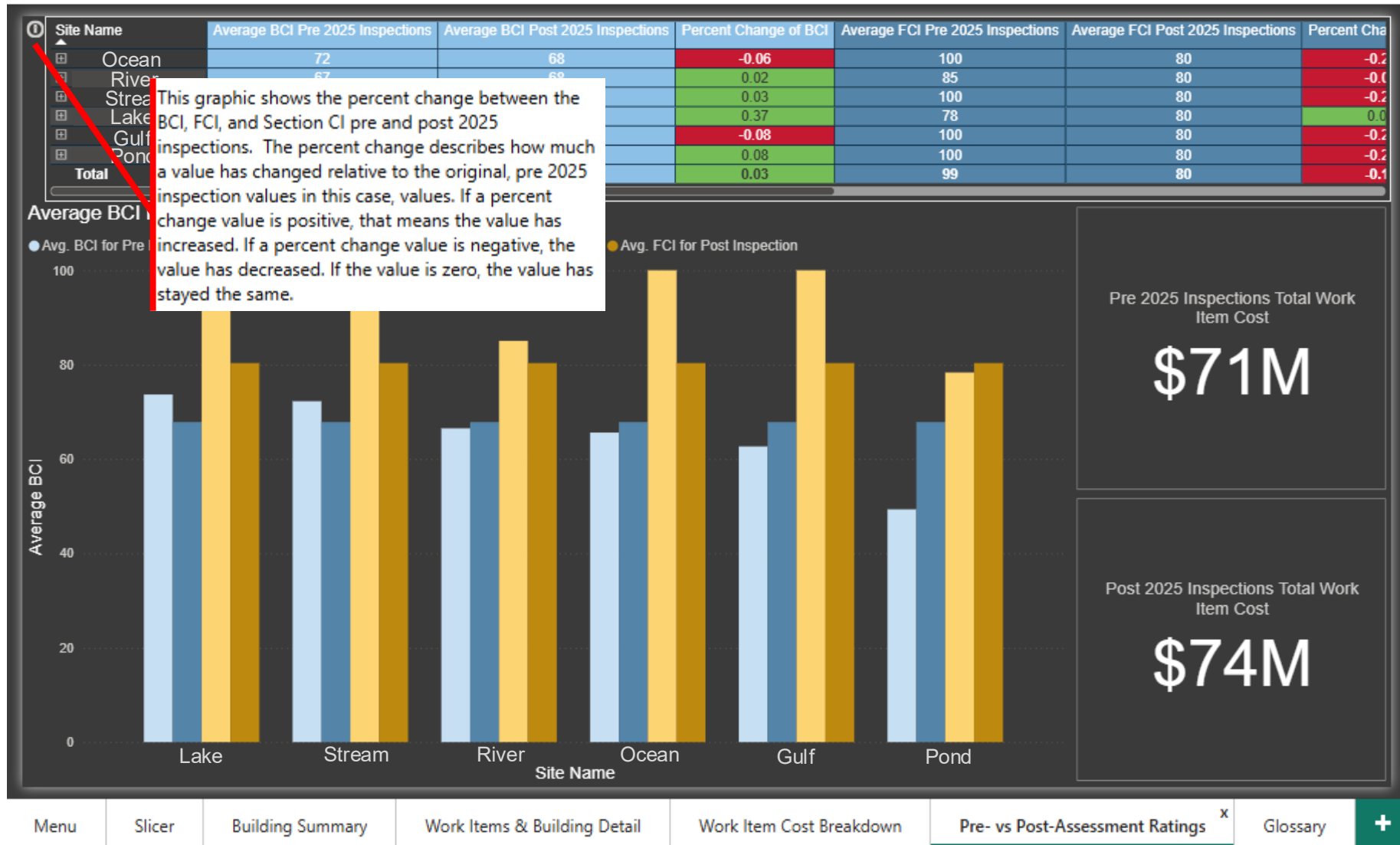
Final Dashboard



Final Dashboard



Final Dashboard



Final Dashboard

Keys

Building Condition Index

- 0-69
- 70-85
- 86-100

Facility Condition Index

- 86-100
- 70-85
- 0-69

Section Condition Index

- 0-55
- 56-85
- 86-100

Sum of Total Cost

- \$10
- \$20
- \$30

Glossary

Term	Definition
Building Condition Index (BCI)	A condition rating for the overall Building. For each Building, the BCI is computed by taking the average of its Systems' CIs, weighted by their respective importance.
Building Functional Index (BFI)	The BFI measures the functionality of a building as a whole through a functionality assessment. The higher the BFI the better. Sometimes referred to as the Building Performance Index (BPI).
Building Performance Index (BPI)	The BPI measures the overall performance of a building. BPI is a combination of the CI and FI, weighted more heavily on the lower of the two.
Component	Component classification as associated with UNIFORMAT Level 3. Components are used to help organize the records of the physical items in a facility.
Component-Section Condition Index (CSCI)	a condition rating for the Component-Section that is aggregated to every other level in the facility hierarchy.
Condition Index (CI)	CI is BUILDER's primary condition measure. The CI for each Component-Section is computed from inspection data that records the type and severity of issues found.
Current Replacement Value (CRV)	The amount of money needed to replace an asset at current rates
Engineering Research and Development Center-Construction Engineering Research Laboratory (ERDC-CERL)	ERDC-CERL helps solve our Nation's most challenging problems in civil and military engineering, geospatial sciences, water resources, and infrastructure. It is a part of the Department of Defense, civilian agencies, and our Nation's public good.
Facility Condition Index (FCI)	FCI is the current maintenance, repair, and replacement deficiencies of the facility divided by the current replacement value of the facility. The calculation is $(1 - (\text{Deferred Work} / \text{Current Replacement Value})) * 100$
Functionality Index (FI)	FI is the primary functionality measure and uses a 0 to 100-point scale in keeping with the SMS Sustainment Management System design. It is computed from assessment data that records the functionality issues present in the building and the severity and density of those issues.
Heating, Ventilation, and Air Conditioning (HVAC)	The HVAC system is used to provide heating and cooling services to buildings
Mission Dependency Index (MDI)	a risk metric used by US military services and federal agencies for guiding operations, management, and funding decisions for facilities
Performance Index (PI)	The PI is a combination of BCI and FI. The performance index is a useful metric that gives planners an idea of a building's overall performance from both the condition and functionality of a building. $PI: (CI * 0.71) + (FI * 0.29)$
Plant Replacement Value (PRV)	The PRV refers to the amount that an entity would have to pay to replace an asset at the present time, according to its current worth. This is for the entire facility.
Real Property Unique Identifier (RPUID)	The RPUID is the unique identification number assigned to each facility in the Real Property Database.
Remaining Service Life (RSL)	The RSL is the remaining service life in years of a section.
RPA Interest Type	RPA Interest Type is the code that identifies the type of interest that the Department of Defense holds in an asset.
Section	Building Sections are the key structures in a BUILDER inventory. Builder Sections actually represent the physical items of a building.
Section Category	Section Category classification as associated with UNIFORMAT Level 4
Section Condition Index (Section CI)	The Section CI is a metric that assesses the current condition of a specific part of a facility or system.
Section Subtype	Section Subtype classification as associated with BUILDER Level 5
Site Condition Index (Site CI)	A condition rating for the target site. The Site CI is computed by taking the average of the BCIs of each building at the site, weighted by their respective importance.
Square Feet (SF)	SF is a unit of area measurement equal to a square measuring one foot on each side.
Sustainment Management System (SMS)	SMS is a suite of web-based software applications developed by ERDC's Construction Engineering Research Laboratory (CERL) to help facility managers decide when, where, and how to best maintain the building infrastructure.
System	System classification as associated with UNIFORMAT Level 2. Systems are used to help organize the records for the actual physical items in a facility.
System Condition Index (SCI)	The SCI measures the condition of a system as a whole. The higher the SCI, the better.

Menu

Slicer

Building Summary

Work Items & Building Detail

Work Item Cost Breakdown

Pre- vs Post-Assessment Ratings

Glossary ^x +

Final Dashboard

① Keys
Glossary

Building Condition Index

- 0-69
- 70-85
- 86-100

Facility Condition Index

- 86-100
- 70-85
- 0-69

Section Condition Index

- 0-55
- 56-85
- 86-100

Sum of Total Cost

- \$10
- \$20
- \$30

BCI, FCI, and Section CI are rated as "Green," "Amber," or "Red." The Sum of Total Cost blue data bars show the percentage each row contributes to the total cost. The larger the contribution to the total cost, the longer the blue bar will be. This "Sum of Total Cost" key is an example.

Current Replacement Value (CRV)	The amount of money needed to replace an asset at current rates
Engineering Research and Development Center-Construction Engineering Research Laboratory (ERDC-CERL)	ERDC-CERL helps solve our Nation's most challenging problems in civil and military engineering, geospatial sciences, water resources, Department of Defense, civilian agencies, and our Nation's public good.
Facility Condition Index (FCI)	FCI is the current maintenance, repair, and replacement deficiencies of the facility divided by the current replacement value of the facility calculation is $(1 - (\text{Deferred Work} / \text{Current Replacement Value})) * 100$
Functionality Index (FI)	FI is the primary functionality measure and uses a 0 to 100-point scale in keeping with the SMS Sustainment Management System design. It is computed from assessment data that records the functionality issues present in the building and the severity and density of those issues.
Heating, Ventilation, and Air Conditioning (HVAC)	The HVAC system is used to provide heating and cooling services to buildings
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Performance Index (PI)	The PI is a combination of BCI and FI. The performance index is a useful metric that gives planners an idea of a building's overall performance from both the condition and functionality of a building. $PI: (CI * 0.71) + (FI * 0.29)$
Plant Replacement Value (PRV)	The PRV refers to the amount that an entity would have to pay to replace an asset at the present time, according to its current worth. The entire facility.
Real Property Unique Identifier (RPUID)	The RPUID is the unique identification number assigned to each facility in the Real Property Database.
Remaining Service Life (RSL)	The RSL is the remaining service life in years of a section.
RPA Interest Type	RPA Interest Type is the code that identifies the type of interest that the Department of Defense holds in an asset.
Section	Building Sections are the key structures in a BUILDER inventory. Builder Sections actually represent the physical items of a building.
Section Category	Section Category classification as associated with UNIFORMAT Level 4
Section Condition Index (Section CI)	The Section CI is a metric that assesses the current condition of a specific part of a facility or system.
Section Subtype	Section Subtype classification as associated with BUILDER Level 5
Site Condition Index (Site CI)	A condition rating for the target site. The Site CI is computed by taking the average of the BCIs of each building at the site, weighted by the number of buildings at the site.
Square Feet (SF)	SF is a unit of area measurement equal to a square measuring one foot on each side.
Sustainment Management System (SMS)	SMS is a suite of web-based software applications developed by ERDC's Construction Engineering Research Laboratory (CERL) to help facility managers decide when, where, and how to best maintain the building infrastructure.
System	System classification as associated with UNIFORMAT Level 2. Systems are used to help organize the records for the actual physical items.
System Condition Index (SCI)	The SCI measures the condition of a system as a whole. The higher the SCI, the better.

Menu
Slicer
Building Summary
Work Items & Building Detail
Work Item Cost Breakdown
Pre- vs Post-Assessment Ratings
Glossary ^x
+

Next Steps

- Integrate SQL Server



- Integrate Microsoft Fabric (for non-DoD clients)



- Integrate with HQIIS

- Integrate with ESMS



Questions?

Thank you!



Contacts

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POND

We earn the trust that sets us apart.