



NORTHWEST
CONSTRUCTION
CONSUMER
COUNCIL

“SUCCESS THROUGH INNOVATION AND TECHNOLOGY”

RAPID FIRE SHARING RECENT INNOVATIONS FROM MEMBERS

1. **Matt Glassman, PCL Construction** - *"Communicating Construction Data using Power BI"*
2. **Jason Engelbrecht, McKinstry** - *"Safety & Performance Dashboard Demo"*
3. **Chris Heinle, Skanska** - *"Dinol Booth Prefab and Soil Freeze"*
4. **Micheal Shill & Brad Velasco, VECA Electric & Technologies** - *"Target Value Design: How Budgets are Maintained From SD to CD"*
5. **Rob Harris, JH Kelly** - *"Modular Construction on Vigor Barge"*
6. **Brian Aske, Lease Crutcher Lewis** - *"Culture Innovations on a Progressive Design-Build Project"*



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1. **Matt Glassman, PCL Construction** - *"Communicating Construction Data using Power BI"*

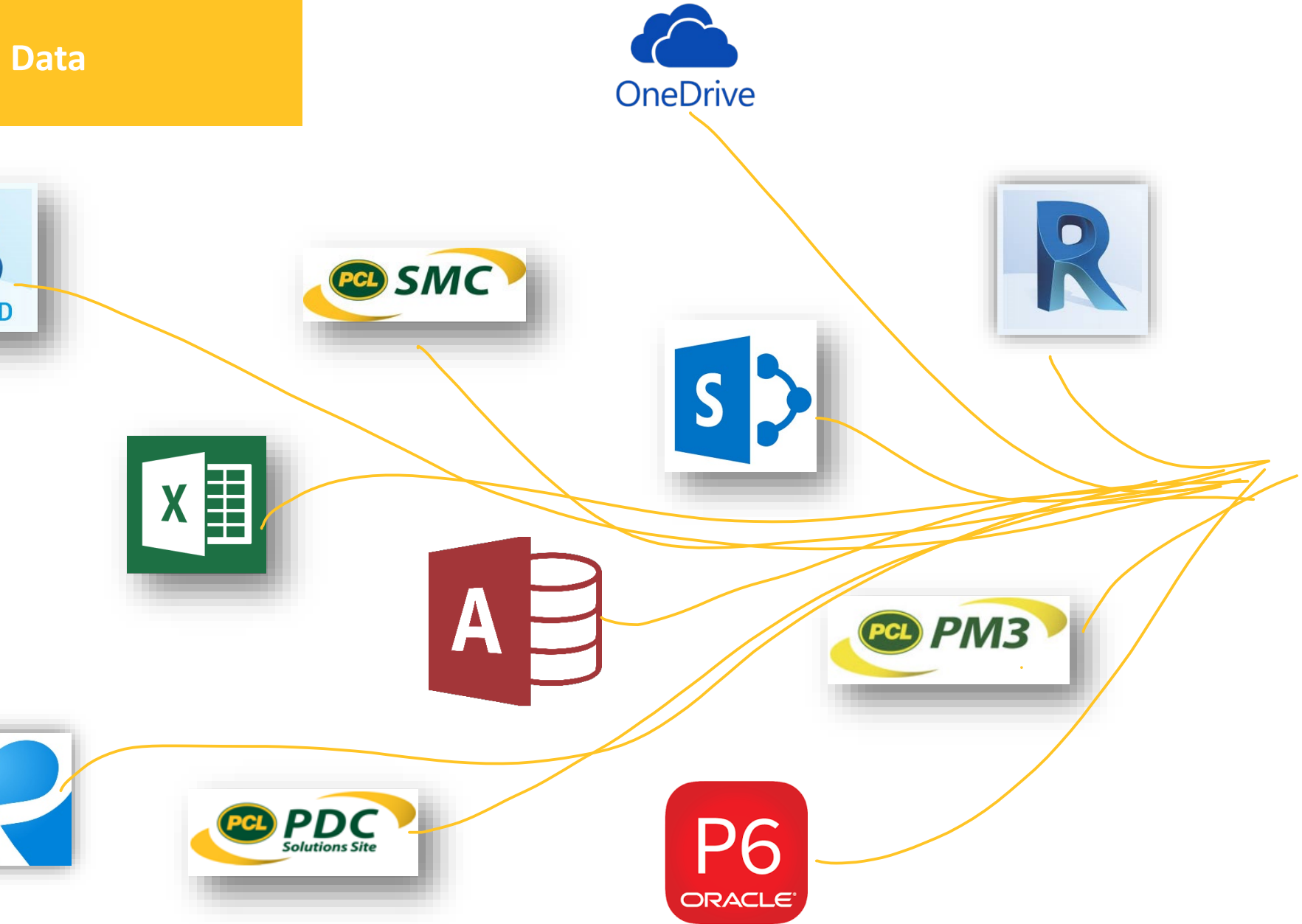
mglassman@pcl.com



Communicating Construction Data

Matt Glassman, PCL Construction
VDC Manager

Data

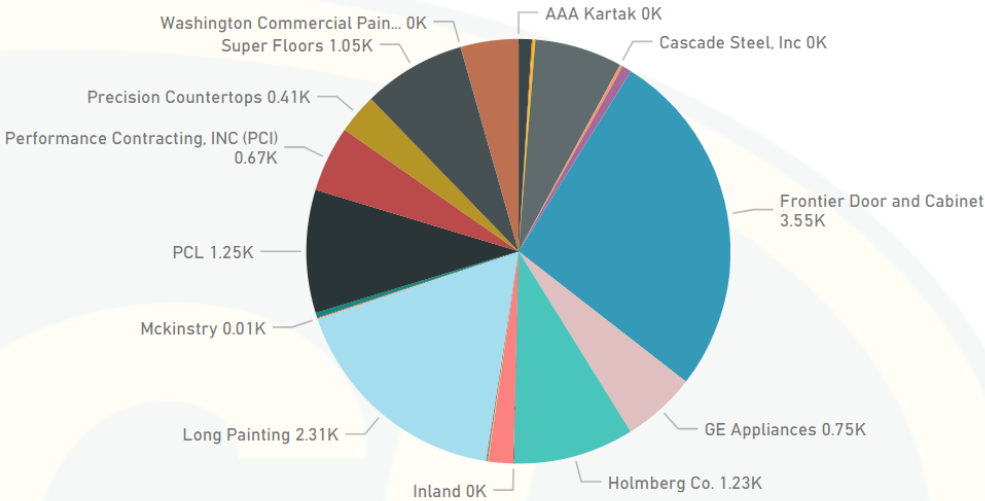


Punch Status

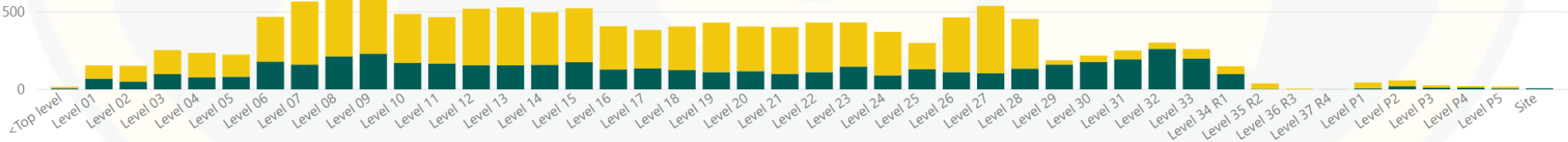
A - Owner/Architect
List

B - PCL List

Status Filter	Status	Count of Status
<input type="checkbox"/> Closed	Closed	13209
<input type="checkbox"/> In Dispute	In Dispute	3
<input type="checkbox"/> Not Approved	Not Approved	4
<input type="checkbox"/> Open	Open	31
<input type="checkbox"/> Ready to Inspect	Ready to Inspect	74
<input type="checkbox"/> Work Completed	Work Completed	15
	Total	13336

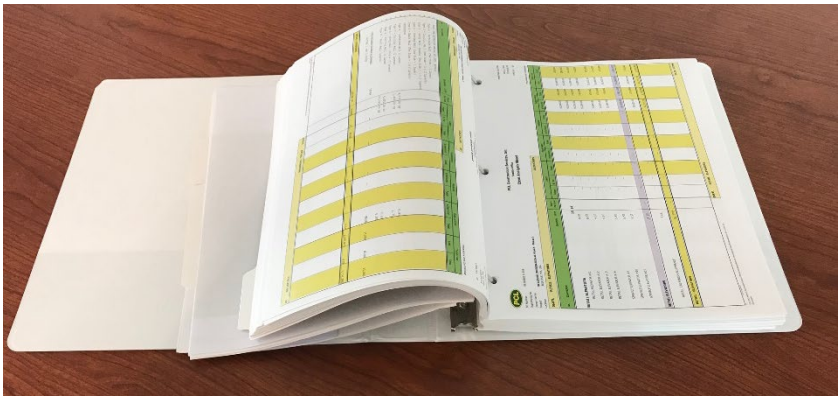


Type ● A - Owner/Architect List ● B - PCL List

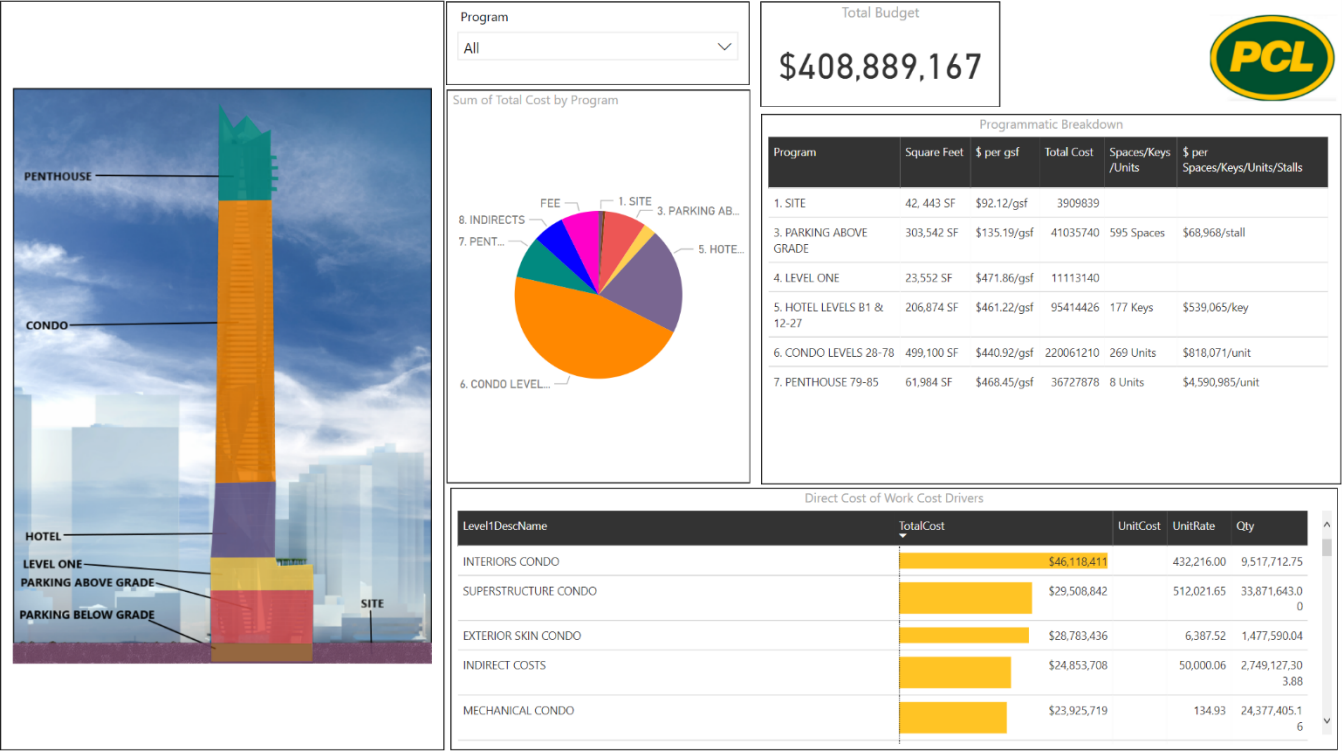
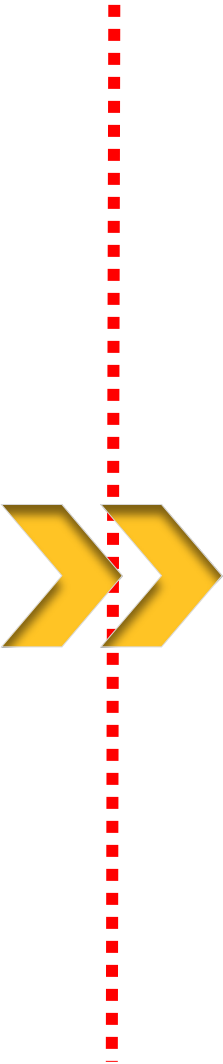


Created	Description	Status	Type	Assigned Company	Author	Location
7/7/2017	Complete heat exchanger re-piping work in L34 mechanical room and commission with Rushin...	Open	B - PCL List	Holmberg Co.	baengen@pcl.com	Level 34 R1 > Interior > 011-Mechanical
7/7/2017	Install U1 drum light in both bedrooms and and puck light in master bed closet	Open	A - Owner/Architect List	Berg	baengen@pcl.com	Level 15 > Interior > 017-Unit K ADA-2Bed
7/7/2017	Insulate P1 trash room domestic water piping. Heat trace is complete.	Open	B - PCL List	Holmberg Co.	baengen@pcl.com	Level P1 > Interior > 004-Trash RM
6/29/2017	TV's on west wall not responding to keypad when trying to turn on.	Open	A - Owner/Architect List	Berg	ltreen@cp-re.com	Level 34 R1 > Interior > 007-Gym
6/28/2017	Entry door scratched on both sides	Ready to Inspect	A - Owner/Architect List	PCL	ltreen@cp-re.com	Level 33 > Interior > 011-PH5-1Bed
6/28/2017	Entry door scratched on corridor side	Ready to Inspect	A - Owner/Architect List	PCL	ltreen@cp-re.com	Level 33 > Interior > 012-PH6-2Bed
6/28/2017	Floor tiles in elevators 1-3 need to be grouted around edges	Ready to Inspect	A - Owner/Architect List	Super Floors	ltreen@cp-re.com	<Top level>
6/28/2017	Master closet missing red, 36" wide opening	Ready to Inspect	A - Owner/Architect List	PCL	ltreen@cp-re.com	Level 33 > Interior > 008-PH3-2Bed

Estimating

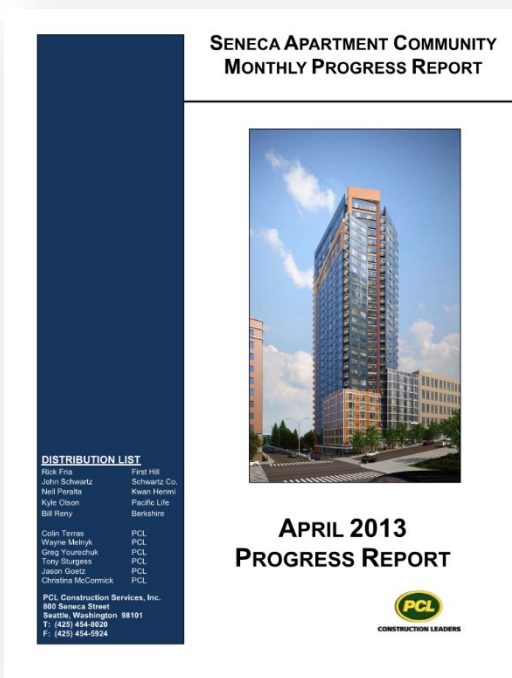


300+ page estimate

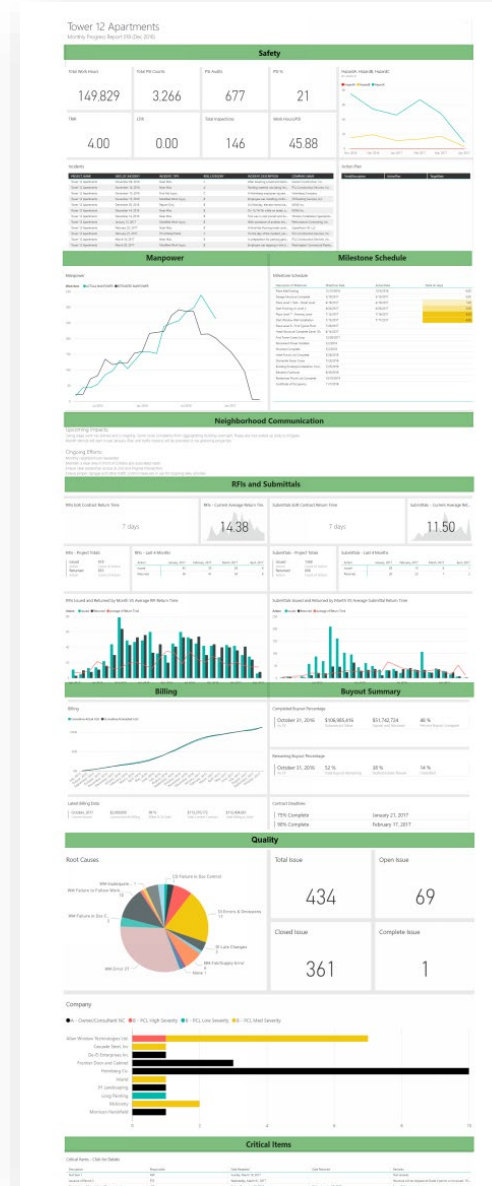


Interactive dashboard

Project Dashboarding

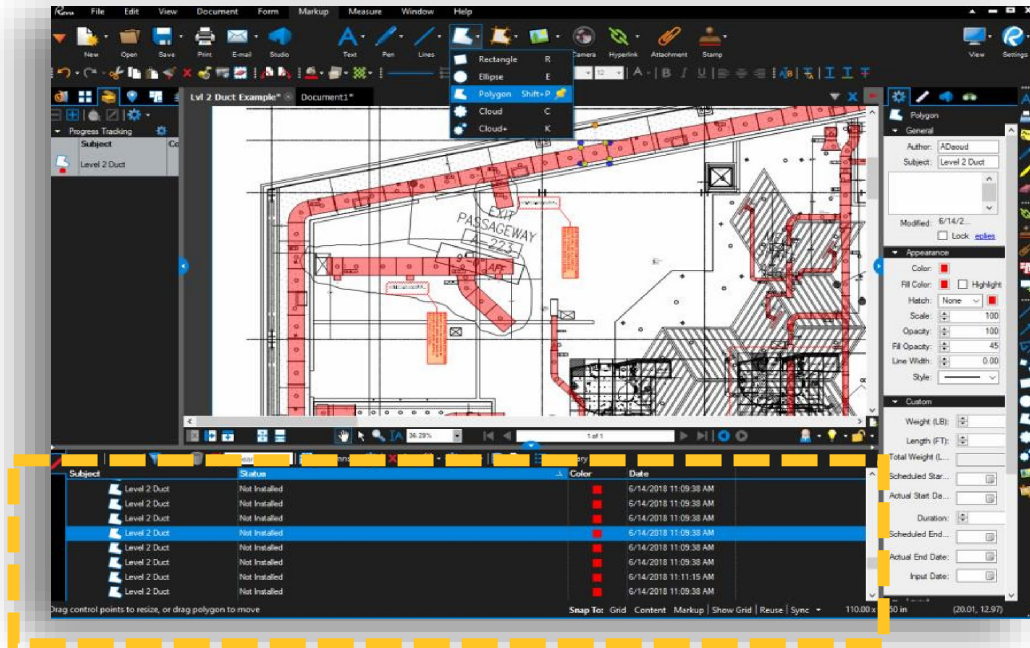


40-60 page book
30 hrs. per month



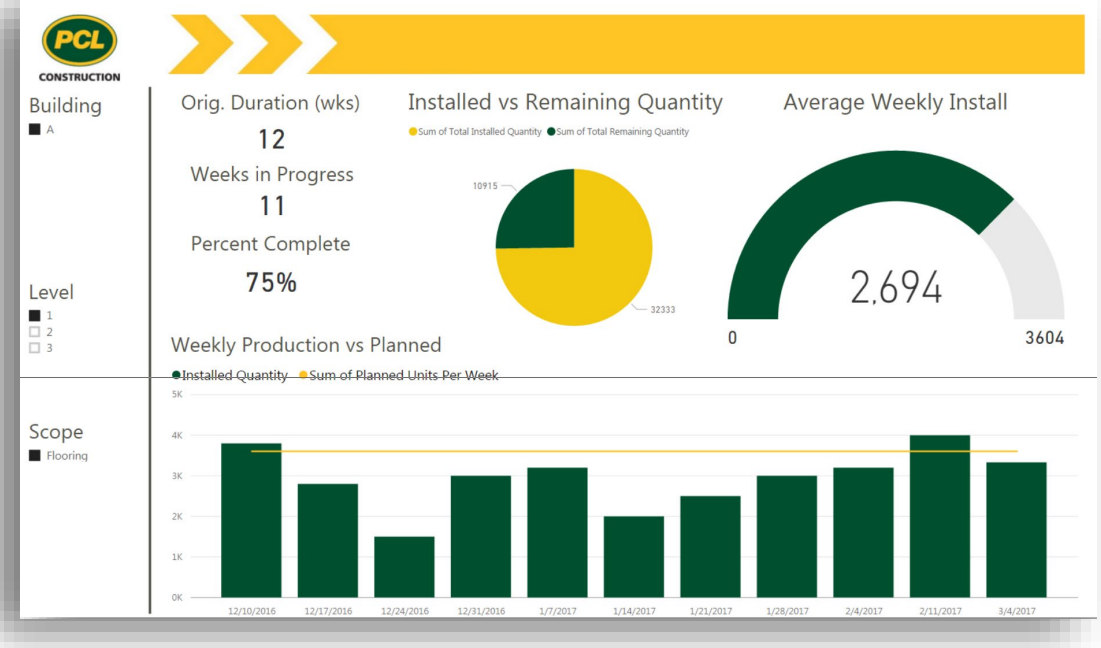
Power BI Dashboard
1 hr. per month

Production Tracking



Bluebeam

Power BI

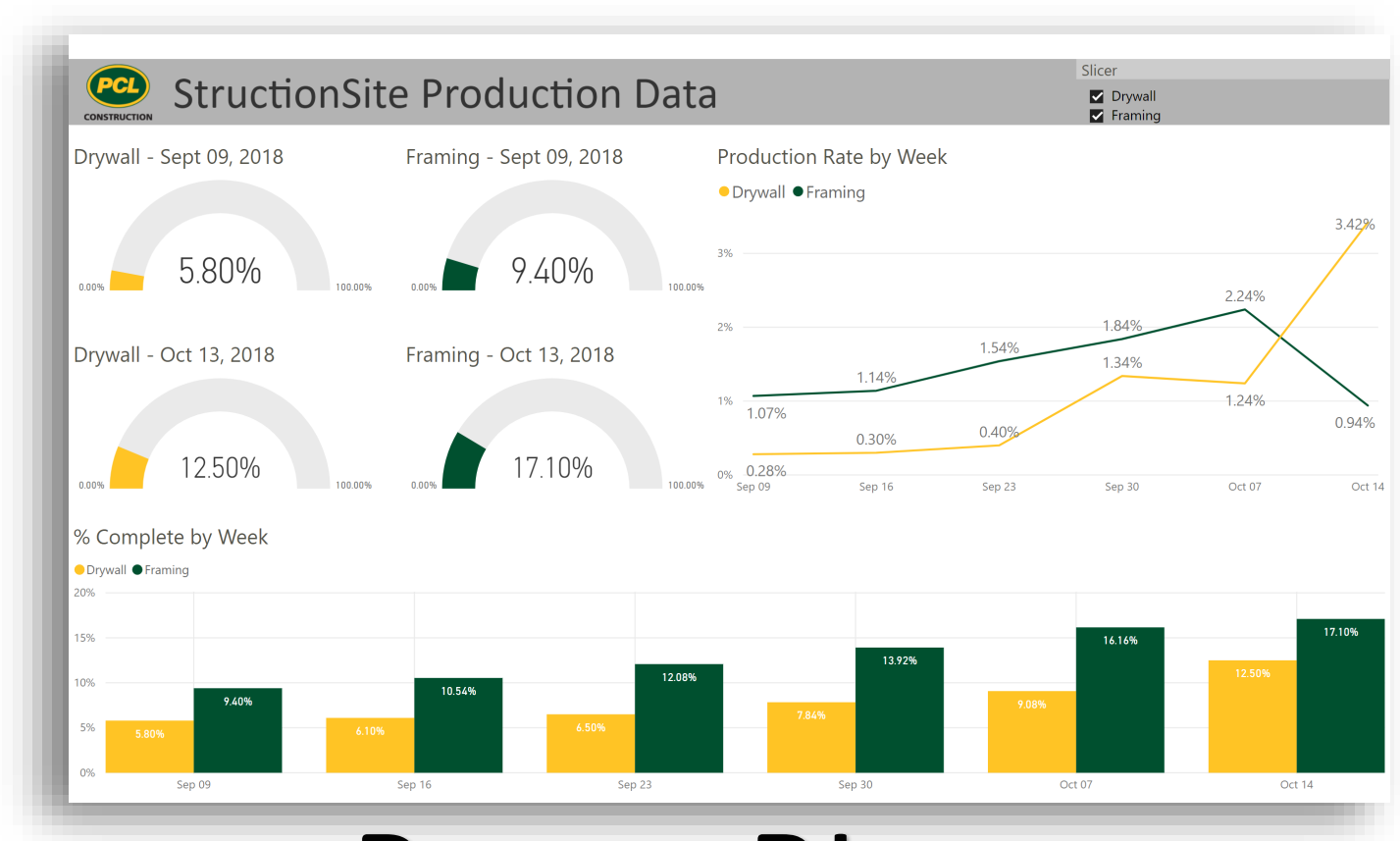


We made strides to improve the process by using tools that were already in the hands of our project teams.

Live Demo



Future Integrations



StructionSite → Power BI

Now we are working to make the collection of data more streamlined and facilitated through processes that our teams are already doing.

Future Integrations



StructionSite - Analysis



SHARING YOUR VISION. BUILDING SUCCESS.

Thank You



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2. Jason Engelbrecht, McKinstry - *"Safety & Performance Dashboard Demo"*

jason@mcKinstry.com



Contact Jason for more information

McKinstry Jobsite Safety Review
Microsoft PowerApps

NWCCC Annual Conference | Jason Engelbrecht
Tuesday, October 30th, 2018





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3. **Chris Heinle, Skanska** - *"Dinol Booth Prefab and Soil Freeze"*

Chris.Heinle@skanska.com

NWCCC – Recent Innovations

Boeing Dinol Booth –
Prefabrication and Ground Freezing

Contact Chris Heinle at Skanska for more details

Chris.Heinle@Skanska.com



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4. **Micheal Shill & Brad Velasco, VECA Electric & Technologies -**
"Target Value Design: How Budgets are Maintained From SD to CD"

Micheal.Shill@veca.com Brad.Velasco@veca.com

TARGET VALUE DESIGN

How Budgets are Maintained from SD to CD



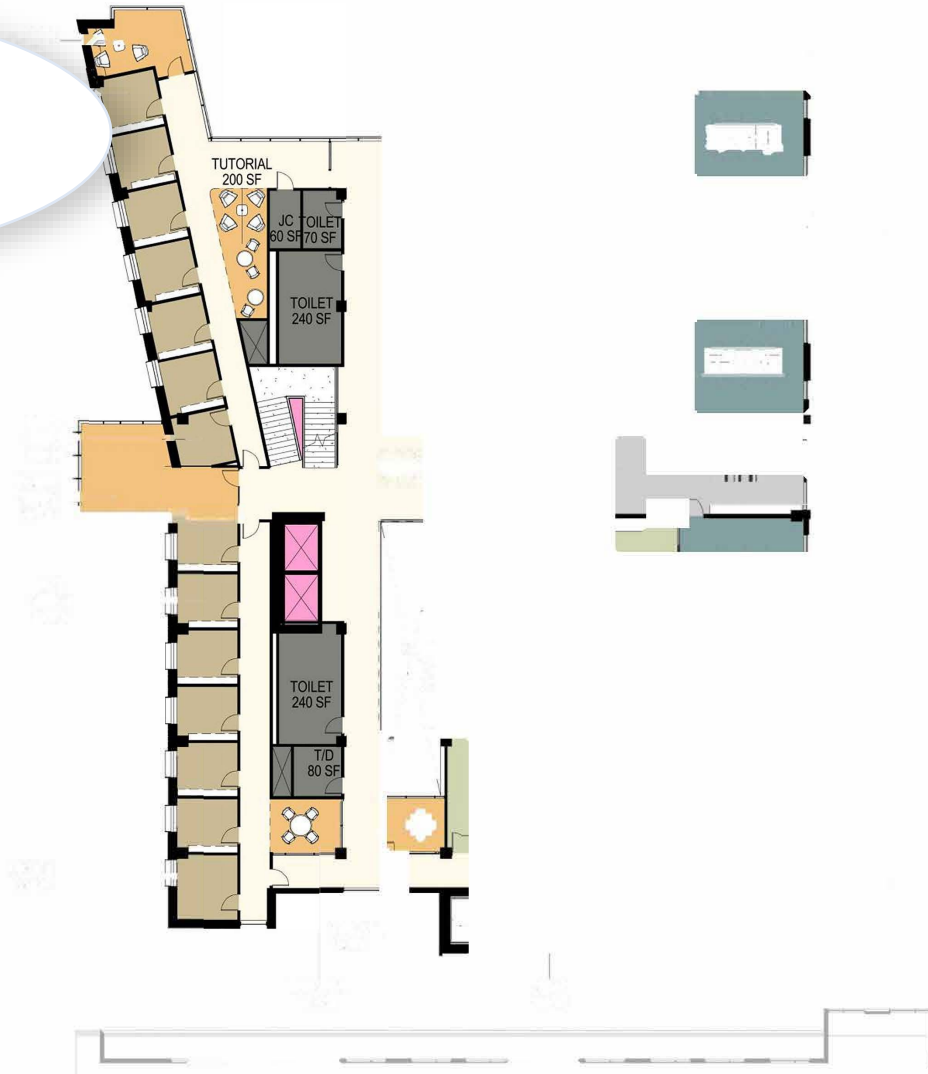
Market Changes

- ✓ Design/Bid/Build
- ✓ Design Assist
- ✓ Progressive Design Build
- ✓ GCCM / ECCM / MCCM

Budgeting Methods with No Design

- ✓ Historical Data
- ✓ Square Foot Pricing
- ✓ Quantitative Take Off

It starts with a Narrative
and a floor plan

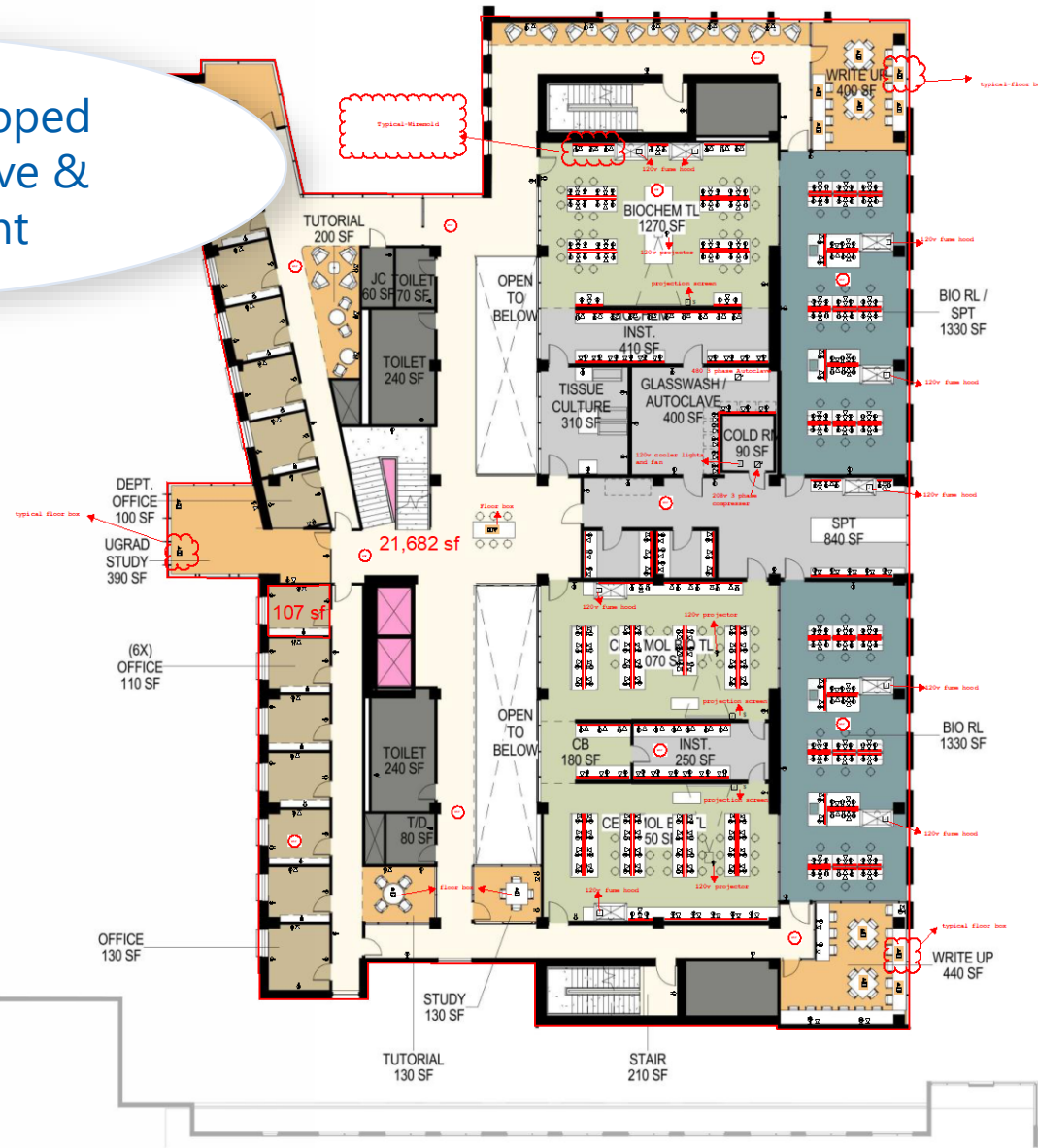


" = 1'-0"
02/02/2018



med 2/2/2018 2

Branch Power developed from Project Narrative & Building Foot Print

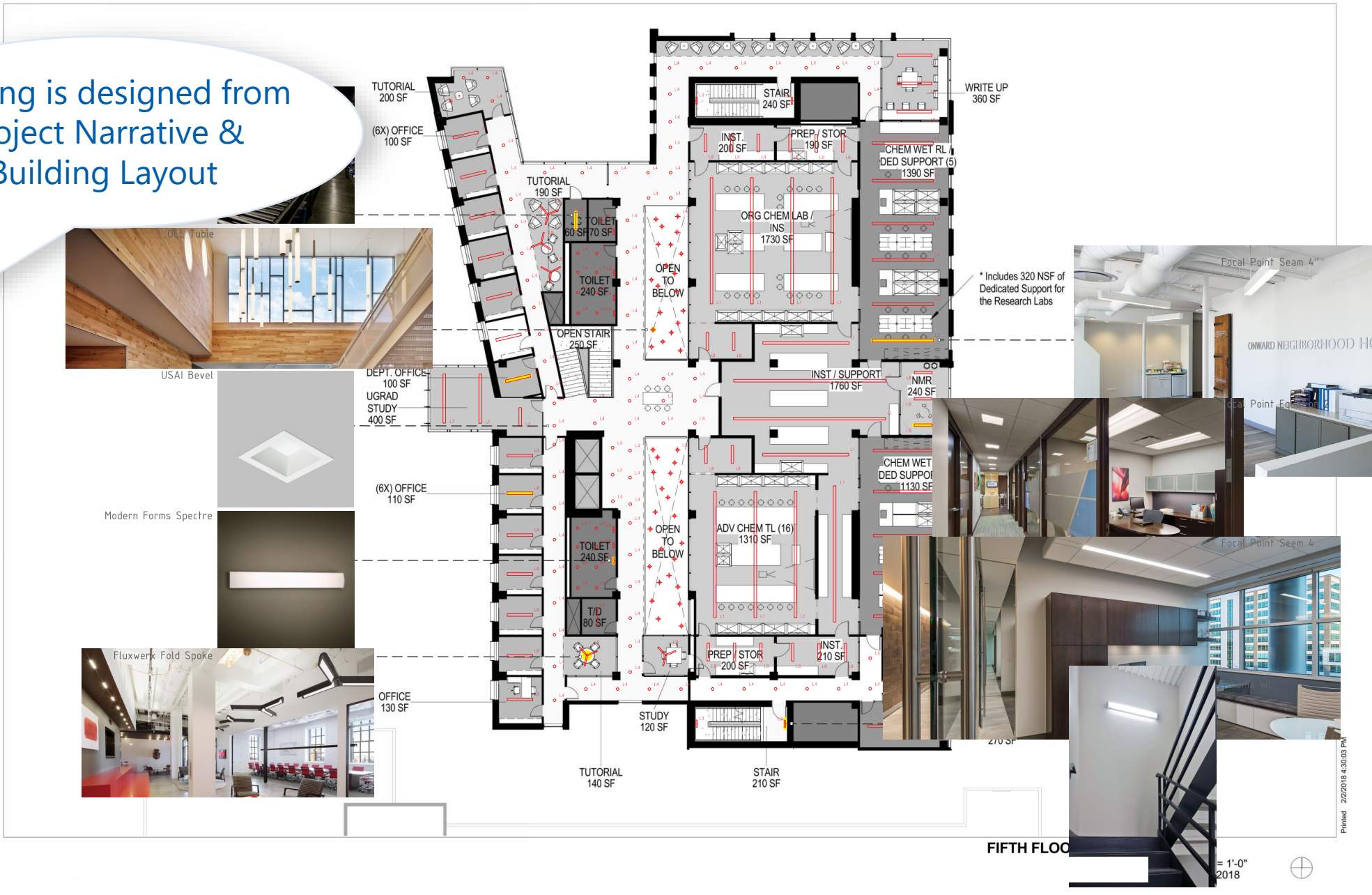


FOURTH FLOOR - BY USE

3/64" = 1'-0"
02/02/2018



Lighting is designed from
Project Narrative &
Building Layout



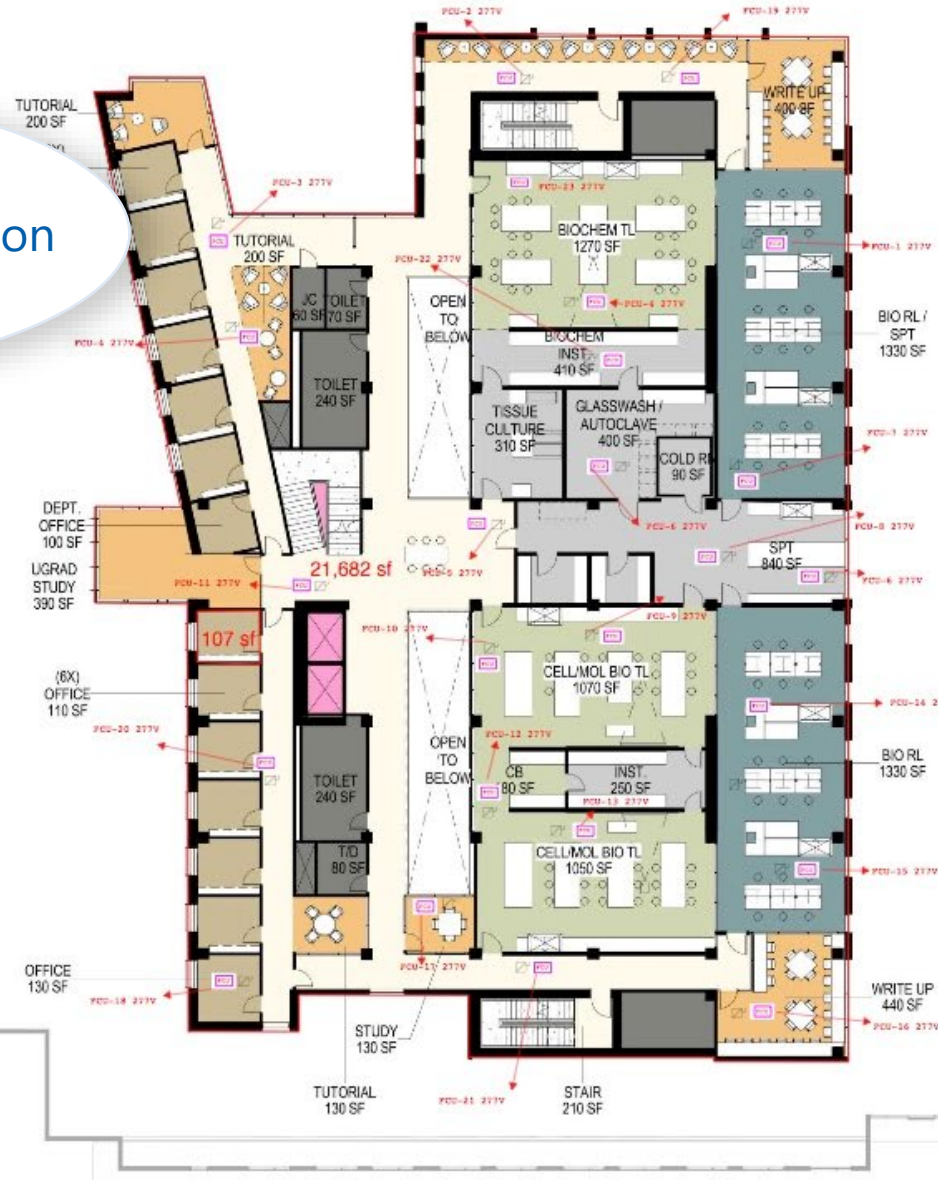
Light Fixture Schedule

VECA works with design and fixture rep to create fixture schedule



TYPE	DESCRIPTION	MANUFACTURER	CATALOGNUMBER	VOLTAGE	MOUNTING	FINISH	LAMP	DRIVER	NOTES
L1	DIRECT/INDIRECT LINEAR PENDANT	FOCAL POINT	SEAM 4"						
L2	4' LENSED STRIP	LITHONIA	ZL						
L3	4' WRAP IN STAIRWELLS	LITHONIA	WL						
L4	4" RECESSED DOWNLIGHT	USAI	BEVEL LED						
L5	DECO TUBE PENDANT	OCL	TUBIE						
L6	18" VANITY SCENCE	MODERN FORMS	SPECTRE						
L7	RECESSED LINEAR SLOT	FOCAL POINT	SEEM 4"						
L8	RECESSED 1X4 TROFFER	FOCAL POINT	EQUATION 2						
L9	DECORATIVE PENDANT IN LOBBY	FLUXWERX	FOLD SPOKE						

Mechanical Scope
developed by BOD & Coordination
with Mechanical Designer



FOURTH FLOOR - BY USE

3/64" = 1'-0"
02/02/2018



Printed: 2025/15.4.28.15 (M)

Once VECA design is finished – quantitative take-off happens

Target Value Budget



	Description	Quantity	Price Unit	Net Cost	Labor	Labor Unit	Total Material	Total Hours
LIGHTING BRANCH	LIGHTING CONTROL QUOTE	114,156	E	\$ 2.50	0	E	\$ 285,390.00	0
LIGHTING BRANCH	L1 LED 5' DIR/IND PENDANT	1	E	\$ -	1.26	E	\$ -	1
LIGHTING BRANCH	L1 LED 8' DIR/IND PENDANT	1	E	\$ -	1.4	E	\$ -	1
LIGHTING BRANCH	L1 LED 10' DIR/IND PENDANT	5	E	\$ -	2	E	\$ -	10
LIGHTING BRANCH	L1 LED 14' DIR/IND PENDANT	23	E	\$ -	2.5	E	\$ -	58
LIGHTING BRANCH	L1 LED 16' DIR/IND PENDANT	18	E	\$ -	2.5	E	\$ -	45
LIGHTING BRANCH	L1 LED 20' DIR/IND PENDANT	105	E	\$ -	3	E	\$ -	315
LIGHTING BRANCH	L1 LED 22' DIR/IND PENDANT	66	E	\$ -	4	E	\$ -	264
LIGHTING BRANCH	L1 LED 30' DIR/IND PENDANT	36	E	\$ -	4	E	\$ -	144
LIGHTING BRANCH	L1 LED 36' DIR/IND PENDANT	8	E	\$ -	8	E	\$ -	64
LIGHTING BRANCH	L1 LED 49' DIR/IND PENDANT	4	E	\$ -	8	E	\$ -	32
LIGHTING BRANCH	L2 LED 4' CHAIN MT STRIP	39	E	\$ -	1	E	\$ -	39
LIGHTING BRANCH	L3 LED 4' SURF WRAP STAIRWELLS	20	E	\$ -	1	E	\$ -	20
LIGHTING BRANCH	L4 LED 4' REC DOWNLIGHT	496	E	\$ -	1.2	E	\$ -	595
LIGHTING BRANCH	L5 LED DEC PENDANT	42	E	\$ -	1	E	\$ -	42
LIGHTING BRANCH	L6 LED 18" VANITY WALL SCONCE	34	E	\$ -	1.5	E	\$ -	51
LIGHTING BRANCH	L7 LED 4' REC LINEAR SLOT	1	E	\$ -	1	E	\$ -	1
LIGHTING BRANCH	L7 LED 6' REC LINEAR SLOT	8	E	\$ -	1.5	E	\$ -	12
LIGHTING BRANCH	L7 LED 12' REC LINEAR SLOT	25	E	\$ -	2	E	\$ -	50
LIGHTING BRANCH	L7 LED 18' REC LINEAR SLOT	11	E	\$ -	2.5	E	\$ -	28
LIGHTING BRANCH	L8 LED 1X4 REC TROFFER	154	E	\$ -	1	E	\$ -	154
LIGHTING BRANCH	L9 LED DEC PENDANT LOBBY	25	E	\$ -	3	E	\$ -	75
LIGHTING BRANCH	EXIT FIXTURES	75	E	\$ -	1	E	\$ -	75
LIGHTING BRANCH	1/2" CONDUIT - EMT	14,364	C	\$ 28.75	4.5	C	\$ 4,129.65	646
LIGHTING BRANCH	1" CONDUIT - EMT	8,000	C	\$ 87.75	6	C	\$ 7,020.00	480
LIGHTING BRANCH	1/2" CONN SS STL - EMT	2,394	C	\$ 20.49	8	C	\$ 490.53	192
LIGHTING BRANCH	1" CONN SS STL - EMT	160	C	\$ 64.70	12	C	\$ 103.52	19
LIGHTING BRANCH	1/2" COUPLING SS STL - EMT	1,436	C	\$ 19.57	4	C	\$ 281.10	57
LIGHTING BRANCH	1" COUPLING SS STL - EMT	800	C	\$ 39.40	6	C	\$ 315.20	48
LIGHTING BRANCH	3/4" CONN COMP STL - EMT	20	C	\$ 39.18	14	C	\$ 7.84	3
LIGHTING BRANCH	1/2" CONDUIT SUPPORT FOR ROD OR FLNG	1,796	C	\$ 37.95	5	C	\$ 681.39	90
LIGHTING BRANCH	1" CONDUIT SUPPORT FOR ROD OR FLNG	1,000	C	\$ 50.00	6	C	\$ 500.00	60
LIGHTING BRANCH	#12 THHN	68,086	M	\$ 121.90	6	M	\$ 8,299.63	409
LIGHTING BRANCH	#10 THHN	79,200	M	\$ 186.50	7.5	M	\$ 14,770.80	594
LIGHTING BRANCH	#12/2C CABLE MC - STL ARMOR	3,480	M	\$ 426.10	26	M	\$ 1,482.83	90
LIGHTING BRANCH	3/8" CONN AC-90 / MC DC SS	1,160	C	\$ 21.59	10	C	\$ 250.44	116
LIGHTING BRANCH	WIRE CONN RED	8,544	C	\$ 16.75	2	C	\$ 1,431.12	171
LIGHTING BRANCH	4x 2 1/8" SQ BOX COMB KO	1,013	C	\$ 141.51	30	C	\$ 1,433.50	304

Target Value Budget

Labor based on
material take-off

DIRECT LABOR

Labor Type	Crew	Hours	Rate \$		Total
FOREMAN	1	10,099.74	\$	88.24	\$ 891,201.06
JOURNEYMAN	1	10,099.74	\$	82.12	\$ 829,390.65
85%	1	10,099.74	\$	71.42	\$ 721,323.43
Totals	3	30,299.22	\$	80.59	\$ 2,441,915.14



Target Value Budget

Escalation is factored into construction start

LABOR ESCALATION

Escalation Period	Description	% of Contract	Labor Hours	Escalation \$	Total
2/19 TO 2/20	Contract Expiration	40	12,119.69	\$ 5.00	\$ 60,598.45
2/20 TO 2/21	Contract Expiration	60	18,179.53	\$ 10.00	\$ 181,795.30
Totals		100	30,299.22		\$ 242,393.75

Target Value Budget

General Expenses are established early

GENERAL EXPENSES

General Expenses

	Quantity	Field	Cost/Unit	Total Cost
PERMIT	1		\$ 41,142.00	\$ 41,142.00
CONSUMABLES	2,441,915.14	DirLb Total	\$ 0.01	\$ 24,419.15
SAFETY	2,441,915.14	DirLb Total	\$ 0.01	\$ 24,419.15
Totals				\$ 89,980.30



Target Value Budget

Equipment requirements are based on manpower needs

RENTAL EQUIPMENT

Equipment

VECA EQUIPMENT RENT
SCISSOR LIFT 25' MONTHLY

Quantity

Duration

Cost/Unit

Total Cost

1

20

\$

1,500.00

\$ 30,000.00

2

12

\$

545.00

\$ 13,080.00

Totals

\$ 43,080.00



Target Value Budget

Vendor quotes based on our design are not square foot pricing

QUOTED MATERIALS

Quoted Materials

Cost

Vendor

LIGHTING

\$ 792,101.00

PLS

DISTRIBUTION

\$ 342,000.00

STONEWAY ELECTRIC SUPPLY

GENERATOR

\$ 135,000.00

PACIFIC DETROIT DIESEL

FIRE ALARM

\$ 100,000.00

ABSCO

DATA/COMM

\$ 553,200.00

VECA COMM

AV SYSTEM

\$ 123,019.00

VECA COMM

CLOCK SYSTEM

\$ 28,000.00

ABSCO

CCTV

\$ 25,000.00

ABSCO

Totals

\$ 2,098,320.00



Target Value Budget
established at
Schematic Design

Target Value Budget

FINAL PRICING

Final Pricing	Calculated (%)	Calculated (\$)
Database Material (Extension)		\$ 1,108,607.55
Material Escalation		\$ 22,172.15
Quoted Material (Extension)		\$ 471.82
Quoted Material		\$ 2,098,320.00
Material Total		\$ 3,229,571.52
Direct Labor		\$ 2,441,915.14
Labor Escalation		\$ 242,393.75
Labor Total		\$ 2,684,308.89
General Expenses		\$ 89,980.30
Equipment		\$ 43,080.00
Total Cost		\$ 6,046,940.71
Total Markup		\$ 559,342.02
Selling Price		\$ 6,989,742.28
Final Price		\$ 6,606,282.73



Target Value Scope

Scope letter confirms design assumptions

Thank you for the opportunity to participate in the above referenced project. The following is our Electrical Scope of Work.

Bid Basis

This proposal is based on the following documentation and as indicated in the scope of work below.

Our pricing is based on Mithun & EYP Conceptual Drawings Dated 1/9/18. Further we have seen the PAE Electrical Narrative dated 9/21/17.

We have estimated a normal work week with an 8-hour work day.

All pricing is based on a Construction Schedule starting June 2019 with completion on February 2021, 20 months.

Scope of Work Base Bid

Building Electrical

Distribution:

- Includes 600V Distribution as shown on VECA one-line diagram.
- Includes all required mounting hardware
- Includes conduit and wire to feed all equipment.

Generator:

- Includes 750KW generator as described in the narrative, further we have included a 600A Automatic Transfer Switch
- Includes all required mounting hardware
- Includes conduit and wire to feed all equipment.

UPS:

- Includes an allowance for a UPS system not yet determined.
- Includes all required mounting hardware
- Includes conduit and wire to feed all equipment.

Lighting & Lighting Control:

- Includes light fixtures quote allowance as laid out on the attached VECA drawings, fixture schedule, cut sheets and quantities. We have included one thousand one hundred ninety-seven (1,197) light fixtures.
- Includes lighting controls pricing is an allowance, unable to determine at this time the requirements, pricing is based on past projects.
- Includes installation of light fixtures, lighting control devices, mounting hardware and branch wiring to feed all equipment.

Wiring Devices

- Includes wiring devices as shown on the attached VECA drawings.
- Includes surface metal raceway on lab benches and walls as shown on VECA drawings. Further, we have included surface raceway on all walls in the equipment corridors with receptacles and data outlets 3' on center.
- Includes 3-outlets per circuit in all labs and a maximum of 6-outlets per circuits in all other areas.
- Includes specialty outlets as required in the MDF & IDF rooms.
- We have included floor boxes (135), surface raceway (3,000'), 20A Duplex, double duplex and specialty outlets, wall outlets and bench outlets, one thousand nine hundred forty-five (1,945).
- Includes conduit, wire and MC Cable to feed all equipment.

Mechanical Equipment Connections:

- Includes Mechanical Equipment connections as shown on VECA Drawings along with coordination with the Mechanical Narrative, two hundred thirty (230) connections.
- Includes code required disconnect switch.
- Includes starters as shown on the schedule.
- Includes VFD installation only as shown on the equipment schedule. VFD provided by others.
- Includes all required mounting hardware.
- Includes conduit and wire to feed all equipment.

Building Grounding

- Includes grounding riser as described in the electrical narrative, in both electrical rooms and the MDF IDF rooms.

Building Fire Alarm

- Includes fire alarm system as per code and Absco Solutions fire alarm vendor two hundred fifty (250) devices.
- Includes conduit and wire to feed all devices.
- Includes all required mounting hardware.

Building Security Systems


- Includes Access Control System as coordinated with Absco Solutions, we have included twelve (12) doors. All equipment furnished by the Seattle University, Card Readers, Door Contact switch, ½" conduit stubbed into power supply above door with a ¾" conduit run to the IDF room.



Budget is used to manage cost through design process

Cost Management

Budget Tracker

	Conceptual Budget 3/26/18	Variance	NOTES
	TOTALS		
Conceptual Pricing New Building			
New Building Systems Breakdown			
LIGHT FIXTURE QUOTE Allowance	\$ 884,842		Per VECA/ Design Final layout and costs will be determined, Potential VE \$100,000
LIGHTING CONTROLS QUOTE Allowance	\$ 325,180		Allowance, final design and layout to be determined.
LIGHTING BRANCH	\$ 926,951		
DISTRIBUTION	\$ 1,041,215		Per VECA one line diagram see attached
EMERGENCY POWER GENERATOR	\$ 238,990		
UPS	\$ 200,603		Allowance, final design to be determined. 100KW UPS
GROUNDING	\$ 36,525		
WIRING DEVICES	\$ 809,927		Layout for power per VECA Electric drawings
MECHANICAL EQUIPMENT	\$ 627,975		Based on Mechanical Narrative
FIRE ALARM	\$ 267,271		Devices per Absco, VE to consider provide open cable versus conduit and wire.
TELE/DATA ROUGH-IN	\$ 161,901		
TELE/DATA CABLING	\$ 617,970		For the WIFI system includes cabling only We have excluded antenna's, installation, heat map and testing
ACCESS CONTROL	\$ 34,781		Per Absco, All Access Control Equipment and testing is by Owner
CCTV	\$ 52,790		
CLOCK SYSTEM	\$ 152,728		Allowance, included 70 clocks.
AV SYSTEM ROUGH-IN	\$ 87,342		
AV SYSTEM EQUIPMENT	\$ 137,422		
Sub-Total Construction Costs	\$ 6,604,414		
Sub-Total Specified General Conditions for 20 months	\$ 1,358,234		
TOTAL PROJECT	\$ 7,962,648		
Suggested Material Escalation 5% of material cost (add)	\$ 160,000		
Suggested Design Contingency 8% of construction costs (add)	\$ 528,000		
Temporary Power Allowance (add)	\$ 125,000		
6KW PV System (add)	\$ 29,500		
DAS System if required (add)	\$ 93,818		



Cost Management

Budget Tracker

Note the initial budget and final budget

This is how we maintain our budgets start to finish

One of our keys to success on setting/maintaining responsible budgets is to work in a collaborative manor with the Engineers, Architects and General Contractors to achieve our client's vision.

Major Projects*	Initial Budget	Final Budget/Contract
WSCC	\$79,015,125	\$80,350,000
NSAT	\$86,997,533	\$84,777,412
Boeing 777x	\$78,000,000	\$76,814,020
32MW Data center	\$86,000,000	\$84,000,000
UW Life Science	\$19,773,612	\$19,031,846
HACE	\$50,423,496	\$46,966,565



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rwharris@jhkelly.com



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"Modular Construction on Vigor Barge"

<https://www.youtube.com/watch?v=PKKYjBfrbBs&feature=youtu.be>



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6. **Brian Aske, Lease Crutcher Lewis** - *"Culture Innovations on a Progressive Design-Build Project"*

Brian.Aske@lewisbuilds.com

“A critical first step to put the team on the correct track of designing and constructing the facility that exactly matches the goals.”

Contact Brian directly for more details