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AI IMPACT 2024
40th Annual FPC Seminar + Expo
Sept 29 - Oct 1, 2024

*Collaborating and Complying: Using Artificial Intelligence
in the Built Environmen*

Course Number: AHCA 2024.06

Credit Designation: 1 LU/HSW

AIA CES Provider Number: E240

September 30, 2024



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The seminar has teamed with a registered provider of AIA - approved continuing education under Provider Number E240. All registered AIA CES Providers must comply with the AIA Standards for Continuing Education Programs.

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1 OBJECTIVE

Learn how artificial intelligence can be used to improve the health, safety, and welfare of patients in health care facilities by engaging in the review of construction documents to find and identify building and fire code deficiencies that may have been overlooked or missed by human reviewers.

2 OBJECTIVE

Recognize cost (money, time) of rework efforts when project design is not compliant with adopted codes and standards.

3 OBJECTIVE

Identify fundamentals of AI based software platforms and how they operate to compare architectural plans against criteria of building and fire code regulations.

4 OBJECTIVE

Understand the limitations of AI software and the necessity of oversight of AI results to insure the health, safety, and welfare of all the building's occupants.

3

AGENDA

Overview of the Plan Review Process

Challenges

Implementation of New Technology

Potential Solutions



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Agenda

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ACKNOWLEDGEMENTS/CREDITS



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SPEAKERS



Robert Solomon, P.E.
SLS Consulting, LLC
CKO CodeComply.Ai



Matthew Foley, P.E.
Co-Founder
CodeComply.Ai



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RELATED OUTCOMES

1. Distinguish how machine learning and AI can be used together to evaluate a floor plan and provide output using an intuitive interface.
2. Identify how this technology relates to the design-build process to allow code analysis to be completed almost instantaneously.
3. Identify issues in the plan review process and evaluate potential solutions based on real-world examples for means of egress, accessibility, and fire system component layout.
4. Describe the steps in an automated plan review process using machine learning.
5. Learn a bit more about AI and its history



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Our Team



Co-Founder

Michael Sheehan



Co-Founder

Patrick Murphy



Co-Founder

Patrick Hughes



Co-Founder

Matthew Foley



CKO

Robert Solomon



CPO

Dawn Keller



CTO

Piotr Jaworski

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A Few Words on Terminology

- **Artificial Intelligence-AI**
 - Theory and development of computer systems that perform tasks that augment for human intelligence such as perceiving, classifying, learning, abstracting, reasoning, and/or acting. [["Mathematics Of Big Data And Machine Learning"](#): MIT Lincoln Labs]
- **Machine Learning-ML**
 - Use of statistics to find patterns in massive amounts of data. Data includes numbers, words, images. [["What Is Machine Learning?"](#) MIT Technology Review]
- **Image Recognition-IR**
 - Ability of software to identify objects, places, ~~people~~, writing and actions in digital images. [[Tech Target Enterprise AI](#)]
- **Optical Character Recognition-OCR**
 - Programs that extract and repurposes data from scanned documents, camera images and image-only PDFs. [[IBM Cloud Education](#)]



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2019

"....AIA members need **resources and support** to serve their clients and communities better in accordance with these commitments."

DISRUPTION, EVOLUTION, AND CHANGE

AIA's vision for
the future of design
and construction

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NFPA
JOURNAL

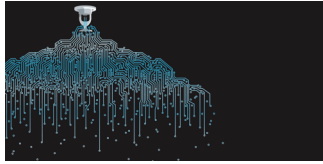
EMERGING ISSUES

Our AI Future

Tools built on artificial intelligence offer a mind-boggling array of possibilities for improving public safety. Just how these technologies will impact public safety raises complex questions that researchers and developers are just beginning to answer.

NFPA JOURNAL

SPRING 2024



CHAPTER 9

SECTION 1

Smart Infrastructure and Fire Protection

Robert Solomon | Kenneth Boyce


As all parts of our everyday living environment, including the infrastructure, building, and life safety systems that keep us protected from harm, become enhanced with sensors and other components to allow for collection of information and to help us gain a better understanding of what is happening around us, it is important that we take time to begin to understand what information we can obtain from those various collection points. It is also important to understand how we can organize those data with a goal of making changes, improving efficiencies, and being able to make decisions more accurately so as to improve reliability and effectiveness of the different fire protection and safety features governed by the prevailing codes and standards for the built environment.

The use of "smart systems" and "smart technology" is rooted in this crossover between understanding performance and trends and being able to predict, improve, or enhance any number of entities. It could be a process improvement, service delivery enhancement, or improvements to building performance and safety.

Globally, the use of smart technology is a key component to help achieve many of the United Nations Sustainable Development Goals (UN-SDGs) by the 2030 deadline.¹ The 17 UN-SDGs depicted in Figure 1.9.1 cut across many diverse boundaries and include elements related to finance, infrastructure, buildings, energy, and health care, among others. Integration of the SDGs is also becoming a regular part of the philosophy for modern-era building design and construction projects.

NFPA Fire Protection Handbook

21ST Edition-2023



40th Annual FPC Sem

Chapter Contents

- Smart Technologies and Terms
- Application and Examples of Smart Technology
- Use and Benefit of Smart Technology Concepts
- Interoperability of Connected Systems
- Application to Fire Protection and Life Safety Systems
- Challenges, Concerns, and Vulnerability

Key Terms

- artificial intelligence,
- cybersecurity, data, Internet of Everything (IoE), Internet of Things (IoT), ISO/IEC/ITU, machine learning, machine readable, predictive analytics, smart city, smart grid, smart systems

THE PLAN REVIEW PROCESS MIGHT LOOK LIKE...

- ✔
To print and fill out the "Application for a Construction Design Release"
- ✔
Complete, sign, and upload a PDF of the "Application for a Construction Design Release"
- ✔
Upload PDFs of all drawings and other documents needed to adequately illustrate the proposed work is in compliance with codes
- ✔
Pay a small fee (credit card or e-check)

Indiana Department of Homeland Security

BUT YOU WILL ALSO NEED...

- To print and fill out the application for a Construction Design Release
- Complete, sign and submit the "Application for a Construction Design Release"
- Upload PDFs of all required documents needed to work is in compliance with codes
- Pay a small fee (credit card or e-check)

A LOT OF PATIENCE

Indiana Department of Homeland Security

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THE PLAN REVIEW PROCESS: HOW LONG DOES IT TAKE?

It depends... everyone's favorite answer!

April 7, 2023 Snapshot

The screenshot shows the City of San Diego website's 'Development Services' section. It features a navigation bar with various service categories like Leisure, Resident Resources, and Business. The main content area is titled 'Development Services' and includes a 'Permit Processing Timeline' section. This section explains that the City of San Diego Development Services Department (DSD) is committed to processing applications for permits as expeditiously as possible and provides a weekly snapshot of the approximate days for applications to be set up, reviewed, and issued.

	Standard	Express	Expedite	Rapid Review
This is the average time to complete the first plan check review and subsequent reviews, based on standard review times for applications reviewed within the last 30 calendar days, and does not include Express Plan, Expedite, or Rapid Review project reviews.				
Review Discipline	Number of Reviews In-Queue	Number of Reviews Completed	First Reviews (Average Days) ¹	Rechecks (Average Days) ²
DSD-Engineering Building Review	791	458	92	49
DSD-Structural	773	572	89	18
DSD-Combined	584	303	49	23
DSD-Planning Review	442	434	32	24
DSD-Electrical	227	103	83	21
DSD-Addressing	81	197	21	15
DSD-Storm Water Review	32	1	236	*

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COST OF REWORK

“Faced with labor shortages, rising project costs, materials shortages, and a climate crisis that’s heating up, contractors and asset owners cannot afford to waste a single resource.

Inaccurate building, leading to errors and rework (redoing work due to errors), is a project killer and contributor to these issues.

Rework accounts for more than 30% of all work on site and costs between 2.4% and 12.4% of project contract value.

Technology can lend a hand here.”

– Fast Company (2023)

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PRODUCTIVITY

68 percent of skilled trade workers feel a desire to work with innovative, non-traditional tools, NFPA survey finds

December 13, 2022 – The National Fire Protection Association® (NFPA®) today released its 2023 Industry Trends Survey, which reveals insights around employee sentiment on training and labor shortages, use of technology on the job site and how technology supports their top priorities.

As industry hiring lags, skilled trade workers emphasize training

Nearly half of respondents (45 percent) said a shortage of qualified workers would be their biggest challenge at work in 2023. Additionally, 42 percent said they anticipate their budgets will focus on increased hiring to replace or add jobs in 2023.

“In 2023, we anticipate hiring and retention to remain a top priority across workforces, but especially in the skilled trade industry,” said Kyle Spencer, Director of NFPA LINK®. “These insights directly from men and women on the job emphasize the need for accessible training among teams struggling to maintain a full staff.”

Closely following concerns around a hiring shortage, 42 percent of respondents cited lack of knowledge sharing and collaboration as their top challenge, while 32 percent said codes and standards requirements continuously evolving would be their greatest challenge in the new year.

Skilled trade workers utilize technology on the jobsite, but there’s room for improvement

Thirty-two percent of respondents are currently utilizing technology on the jobsite on a day-to-day basis, while 22 percent utilized technology multiple times a week. With this in mind, nearly one-third (28 percent) of trade workers anticipate their organizations’ 2023 budgets will be focused on updating manual or outdated equipment.

These potential budget increases are in line with employee priorities: the survey also found that 68 percent of respondents felt a desire to work with innovative, non-traditional tools on a jobsite, while 17 percent found that the lack of job-enabling technology was one of their biggest challenges on the jobsite in 2022.

Further, 40 percent of respondents believed the biggest opportunity for technology to improve their day-to-day work on the jobsite would be for ease of communication between team members.

- 25 percent believed it would improve accuracy and safety
- 13 percent believed it would resolve code and inspection disputes more quickly
- 11 percent believed it would provide quick and easy access to codes and standards
- 10 percent believed it would give customers confidence in their organization’s ability

Technology implementation will support skilled trade workers’ top priorities on the jobsite

When asked what they most prioritize on a jobsite, 37 percent of respondents said quality of work, while 31 percent identified safety and security as top priority. To that end, 25 percent of respondents believe technology implemented in their day-to-day job functions would improve accuracy and safety.

“Safety and quality of work will always remain a top priority for managers and their teams, but the challenge ahead is acting proactively rather than reactively. Industry leaders must equip their professionals with the proper tools to improve their day-to-day job functions, enabling the next generation of employees to pave the industry’s path forward,” said Spencer.

For this release and other announcements about NFPA initiatives, research, and resources, please visit [NFPA press room](#).

Survey Methodology

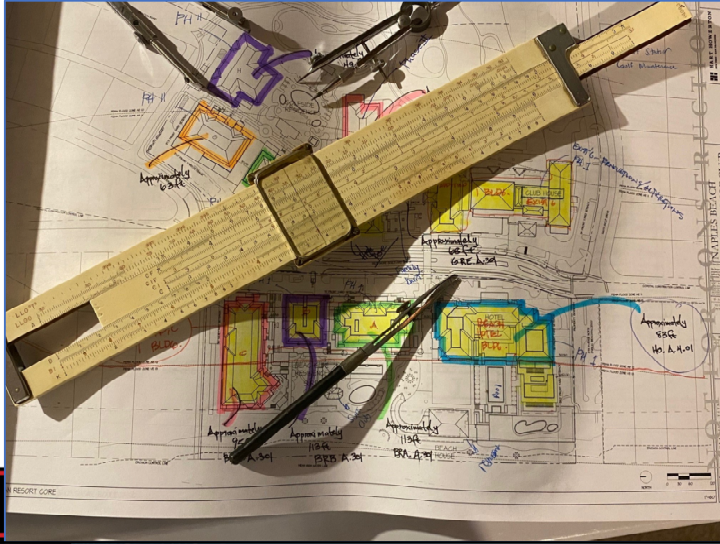
NFPA collected responses from 330 U.S.-based workers, 18-years and older in the electrical, manufacturing, construction, engineering, architect/design, facility maintenance, fire service, and insurance/risk management fields, via a third-party provider to determine findings of its 2023 Industry Trends Survey. The survey was conducted between October 20, 2022 – November 4, 2022.

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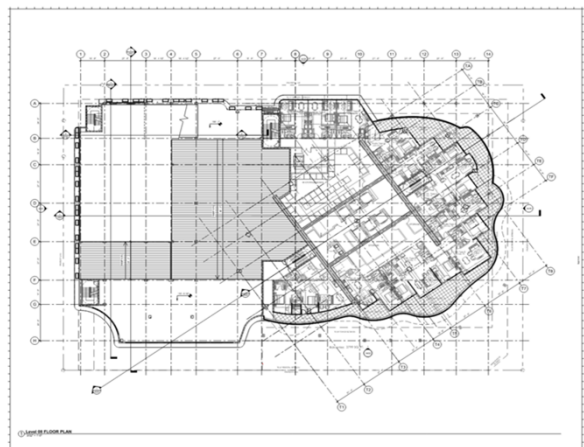
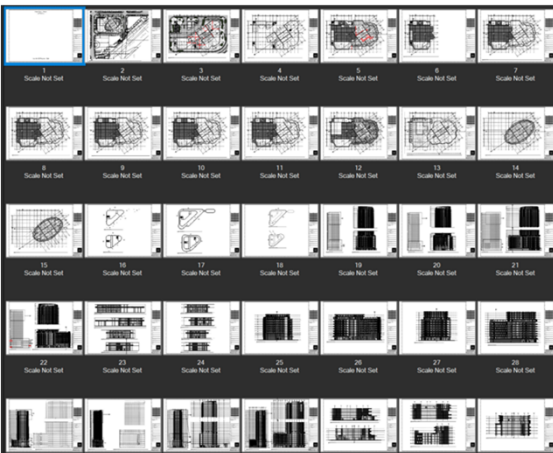
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THE PLAN REVIEW PROCESS: WHAT DOES IT LOOK LIKE?



Seminar + Expo

THE PLAN REVIEW PROCESS: WHAT DOES IT LOOK LIKE?



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THE PLAN REVIEW PROCESS: WHAT DOES IT LOOK LIKE?

COMMENT ID	COMMENT	DATE RECEIVED	RECOMMENDATION
184	OCCUPANT LOAD - RESIDENTIAL	OCCUPANT LOAD FACTOR WHERE AN OCCUPANT LOAD FACTOR IS SPECIFIED IN THE IBC, THE OCCUPANT LOAD FACTOR SHALL BE THE BASIS FOR CALCULATING THE PERMITTED OCCUPANCY SHALL BE CONSIDERED A STRATEGY.	IBC 1010.1.2.2
185	OCCUPANT LOAD - PARKING GARAGE	CALCULATE THE OCCUPANT LOAD OF EACH PARKING SPACE AS INDICATED BY THE IBC.	IBC 1010.1.2.2
186	OCCUPANT LOAD - POOL DECK	WHERE AN OCCUPANT LOAD FACTOR IS SPECIFIED IN THE IBC, THE OCCUPANT LOAD FACTOR SHALL BE THE BASIS FOR CALCULATING THE PERMITTED OCCUPANCY SHALL BE CONSIDERED A STRATEGY.	IBC 1010.1.2.2
187	OCCUPANT LOAD - POOL WATER	CALCULATE THE OCCUPANT LOAD OF EACH POOL WATER AREA AS INDICATED BY THE IBC.	IBC 1010.1.2.2
188	OCCUPANT LOAD - RESIDENTIAL AREA	CALCULATE THE OCCUPANT LOAD OF EACH RESIDENTIAL AREA AS INDICATED BY THE IBC.	IBC 1010.1.2.2
189	OCCUPANT LOAD - STAGE	CALCULATE THE OCCUPANT LOAD OF EACH STAGE AS INDICATED BY THE IBC.	IBC 1010.1.2.2
190	STAIRWAY	CALCULATE THE STAIRWAY WIDTH, SPACING, AND ELECTRICAL AREA AS INDICATED BY THE IBC.	IBC 1010.1.2.2
191	OCCUPANT LOAD - TENNIS COURT	CALCULATE THE OCCUPANT LOAD OF EACH TENNIS COURT AS INDICATED BY THE IBC.	IBC 1010.1.2.2
192	DOORWAY	DOORWAY WIDTH SHALL BE AS INDICATED BY THE IBC.	IBC 1010.1.2.2
193	OPENING PROTECTION	FOR WINDOW AND GLASS DOOR OPENINGS, THE DESIGN PROFESSIONAL SHALL PROVIDE PROTECTION AS INDICATED BY THE IBC.	IBC 703
194	OPENING PROTECTION	WHERE THE EDGE OF THE OPENING IS MORE THAN 5 FEET FROM THE OPENING, THE DESIGN PROFESSIONAL SHALL PROVIDE PROTECTION AS INDICATED BY THE IBC.	IBC 703
195	OPENING PROTECTION	WHERE THE EDGE OF THE OPENING IS MORE THAN 5 FEET FROM THE OPENING, THE DESIGN PROFESSIONAL SHALL PROVIDE PROTECTION AS INDICATED BY THE IBC.	IBC 703
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200	OPENING PROTECTION	WHERE THE EDGE OF THE OPENING IS MORE THAN 5 FEET FROM THE OPENING, THE DESIGN PROFESSIONAL SHALL PROVIDE PROTECTION AS INDICATED BY THE IBC.	IBC 703
201	OPENING PROTECTION	WHERE THE EDGE OF THE OPENING IS MORE THAN 5 FEET FROM THE OPENING, THE DESIGN PROFESSIONAL SHALL PROVIDE PROTECTION AS INDICATED BY THE IBC.	IBC 703
202	OPENING PROTECTION	WHERE THE EDGE OF THE OPENING IS MORE THAN 5 FEET FROM THE OPENING, THE DESIGN PROFESSIONAL SHALL PROVIDE PROTECTION AS INDICATED BY THE IBC.	IBC 703
203	OPENING PROTECTION	WHERE THE EDGE OF THE OPENING IS MORE THAN 5 FEET FROM THE OPENING, THE DESIGN PROFESSIONAL SHALL PROVIDE PROTECTION AS INDICATED BY THE IBC.	IBC 703
204	PARKING GARAGE - OPENING	DOORWAY WIDTH SHALL BE AS INDICATED BY THE IBC.	IBC 1010.1.2.2

THE PLAN REVIEW PROCESS

Page 1

Item No.	Description	Response
184	OCCUPANT LOAD - RESIDENTIAL	IBC 1010.1.2.2
185	OCCUPANT LOAD - PARKING GARAGE	IBC 1010.1.2.2
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187	OCCUPANT LOAD - POOL WATER	IBC 1010.1.2.2
188	OCCUPANT LOAD - RESIDENTIAL AREA	IBC 1010.1.2.2
189	OCCUPANT LOAD - STAGE	IBC 1010.1.2.2
190	STAIRWAY	IBC 1010.1.2.2
191	OCCUPANT LOAD - TENNIS COURT	IBC 1010.1.2.2
192	DOORWAY	IBC 1010.1.2.2
193	OPENING PROTECTION	IBC 703
194	OPENING PROTECTION	IBC 703
195	OPENING PROTECTION	IBC 703
196	OPENING PROTECTION	IBC 703
197	OPENING PROTECTION	IBC 703
198	OPENING PROTECTION	IBC 703
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200	OPENING PROTECTION	IBC 703
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203	OPENING PROTECTION	IBC 703
204	PARKING GARAGE - OPENING	IBC 1010.1.2.2

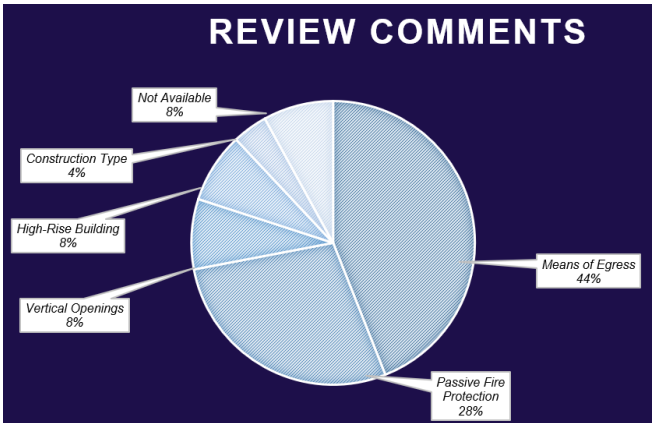


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THE PLAN REVIEW PROCESS: TYPICAL COMMENTS

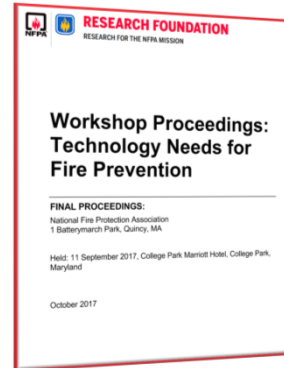
DESCRIPTION	FPC - XXXXXXXXXXXXXXXXXXXX
25	Means of Egress
26	Passive Fire Protection
27	High-Rise Building
28	Means of Egress
29	Means of Egress
30	Means of Egress
31	Means of Egress
32	Means of Egress
33	Means of Egress
34	Means of Egress
35	Means of Egress
36	Means of Egress
37	Means of Egress
38	Means of Egress
39	Means of Egress
40	Vertical Openings
41	High-Rise Building
42	Passive Fire Protection
43	Vertical Openings
44	Passive Fire Protection



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THE PLAN REVIEW PROCESS: CURRENT AND FUTURE STATE

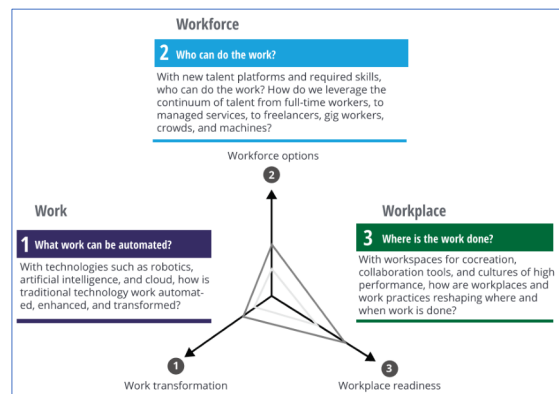


“The future is here. It’s just not widely distributed yet.”
- William Gibson, American-Canadian author (1948)



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THE PLAN REVIEW PROCESS: TECHNOLOGY AND FUTURE STATE



“Prediction is very difficult, especially about the future.”
- Niels Bohr, Danish physicist (1885-1962)



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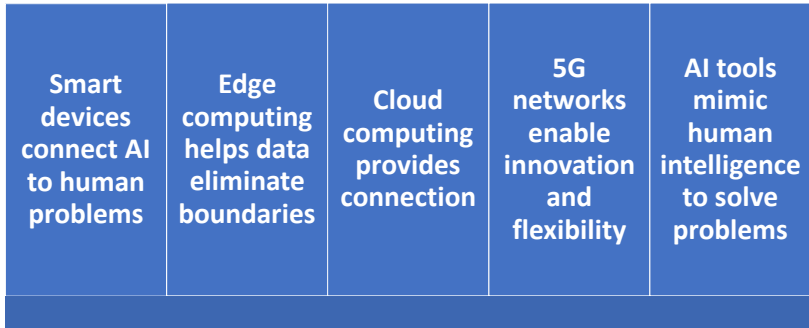
The Plan Review Process -Technology and Future State

“Everything is physics and math.”
Katherine Johnson- American Mathematician (1918-2020)

- Why Now?
- What is Different?



Building the backbone for innovation, speed and thriving humanity

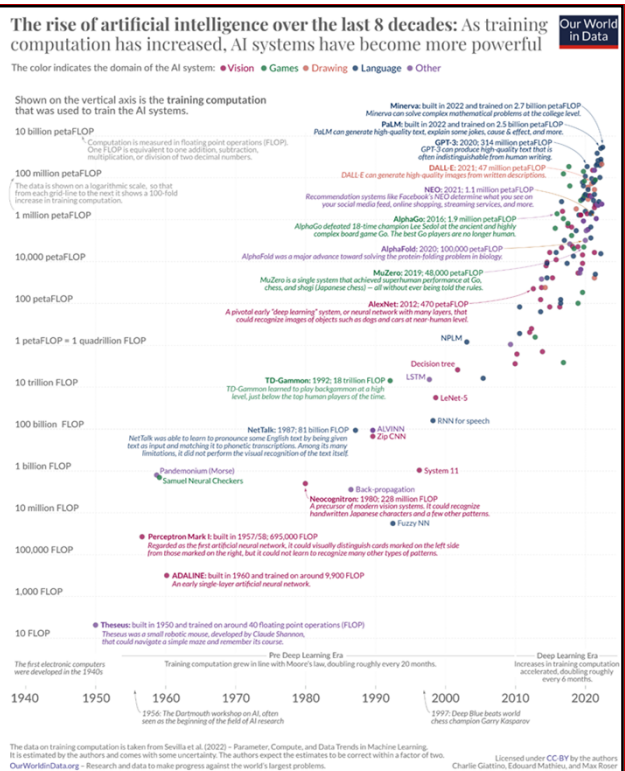
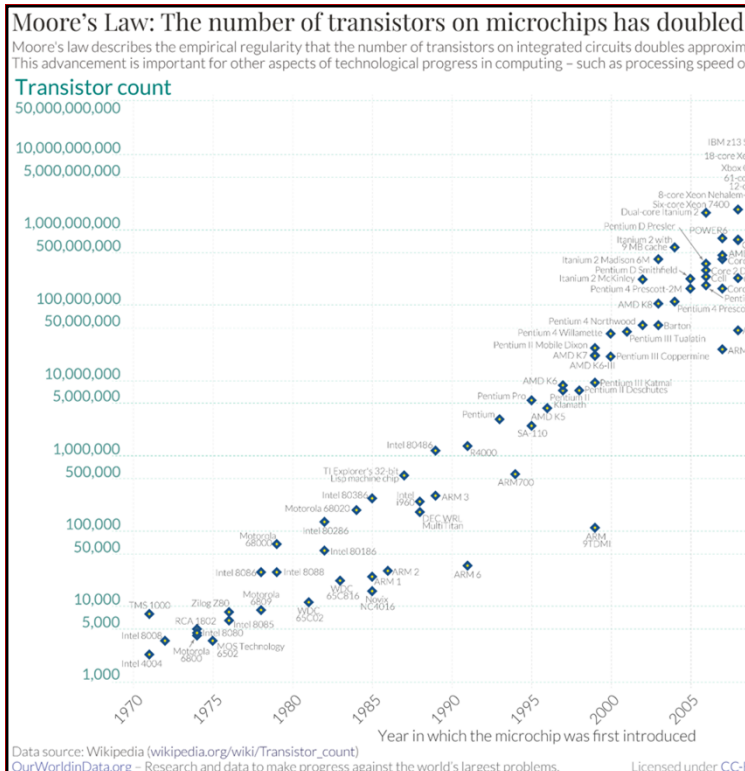


MIT Technology Review FEB 2023



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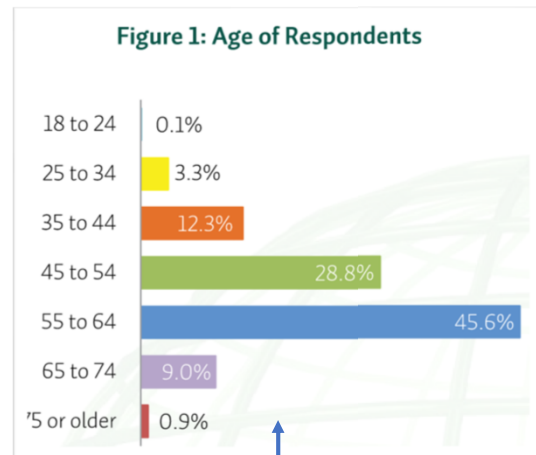
Current Plan Review Process

Extended Review Times

Even top-tier jurisdictions like San Diego exhibit extensive review periods, with initial reviews requiring 92 days and subsequent ones, 49 days each. In contrast, **San Francisco sees an average wait time of 627 days** for permit approvals.

Workforce Demographic Shifts

The building industry is facing challenges due to demographic shifts in the code-related workforce. According to a study completed by ICC, approximately **83% of plan reviewers are above 45 years old**, raising concerns about the sustainability and efficacy of the current building regulatory system



← 2014 REPORT

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Current Plan Review Process

Construction Bottleneck

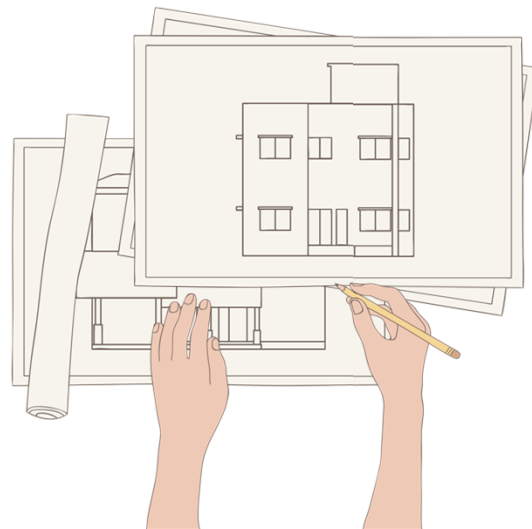
The inefficiency in the permitting process often serves as a blockage that delays the progression of the construction process.

Extensive Manual Analysis

AHJs are tasked with manually scrutinizing every page of a set of plans against hundreds, potentially thousands, of complicated code requirements.

Innovation Opportunity

The increasing transition to digital plan reviews provide a pivotal opportunity for groundbreaking solutions to longstanding industry obstacles.



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Current Plan Review Process



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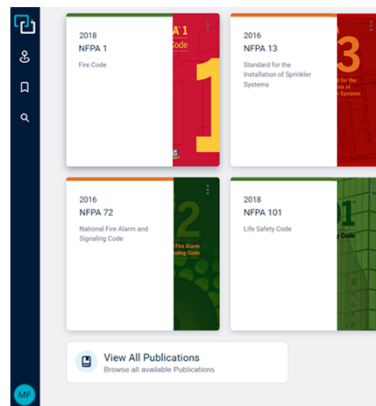
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Codes and Standards – NFPA Resources

NFPA PUBLICATIONS



NFPA LINK



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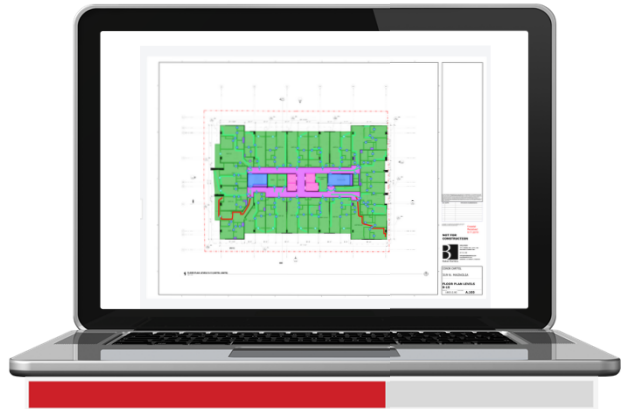
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A Better Solution: CodeComply.Ai

AI-Powered Efficiency: CodeComply leverages advanced AI to automate the review of floor plans against codes and standards, exponentially accelerating the permitting process.

Cross-Departmental Application: A suite of universally applicable review tools to address the unique needs of building, fire, mechanical, electrical, and plumbing departments.

Integrations: Collaboration with leading standard development organizations like NFPA, ICC, and UL, ensuring access to the most up-to-date and comprehensive codes and standards.



Expedite review time from months to minutes

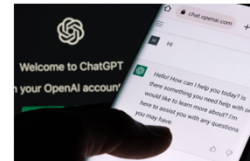
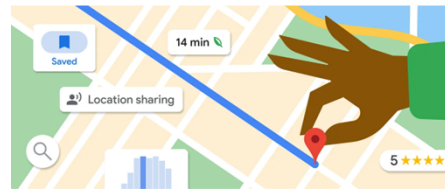
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Demystifying AI



These aren't the droids we're looking for...



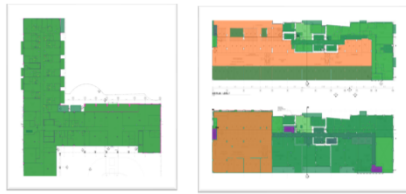
...but these are.

"Technology is a way of organizing the universe so that man doesn't have to experience it."
Max Frisch- Swiss architect, playwright, novelist (1911 - 1981)

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Proprietary Algorithms



Area Recognition

Automatically calculate the area and occupancy of rooms on a floor plan



Object Spacing

Automatically detect symbols and measure the distance between them.



Pathfinding

Automatically evaluate the path of travel for any occupant evacuating a building.

These algorithms are used to develop **over 100 requirements** related to building, fire, and MEP reviews.

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Integration with Codes and Standards



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Integration with Permit Systems



Enterprise Permitting Solution

Electronic Plan Review Tool

AI-Based Code Analysis

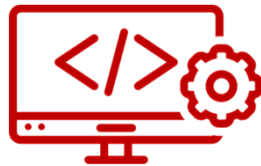
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Our Background



In-House Subject Matter Expertise



Full-stack development team



First AI Floor Plan Review Tool

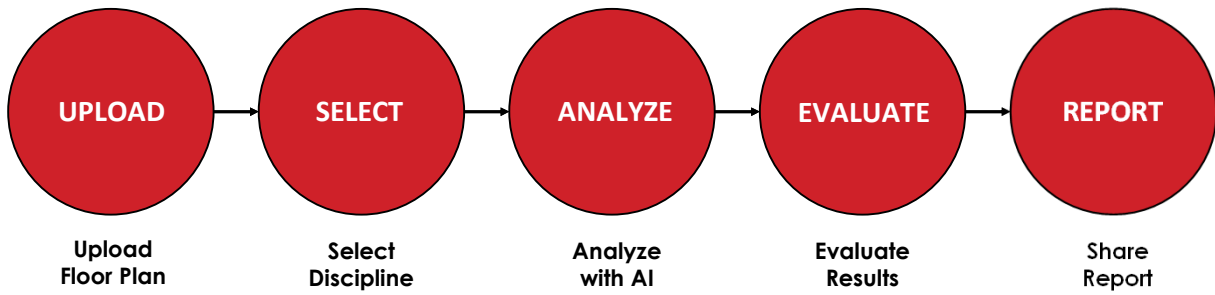


Three Patents Issued (Three Pending)

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Our Workflow



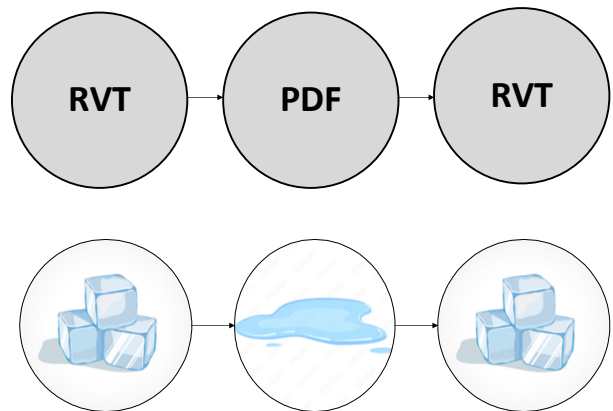
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File Type Conundrum

Starting with RVT, DWG, or PDF?

WHO	WHAT		
	RVT	DWG	PDF
ARCHITECT	X	X	X
ENGINEER	X	X	X
CONSULTANT		X	X
DEVELOPER			X
AHJ			X



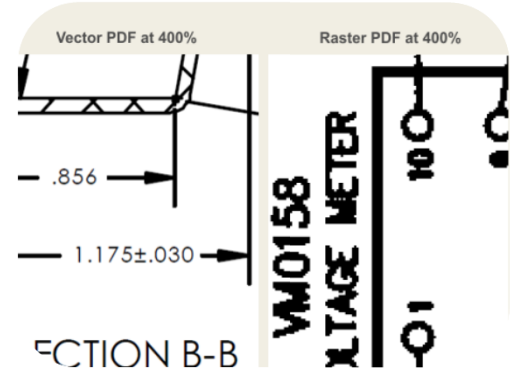
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PDF Flexibility

Vector Content: Images built by equations, lines, and curves with fixed points

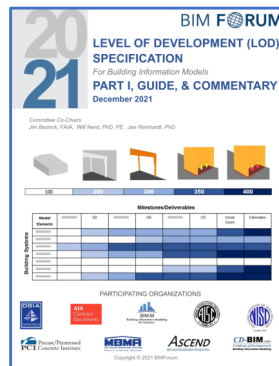
Raster Content: Images built from a series of pixels



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Automating Code Compliance With AI and ML: The PDF Conundrum

- Revit vs AutoCAD vs ????
- Level of Development (LOD) Across Projects Not Consistent
- Industry Foundation Classes (IFC)

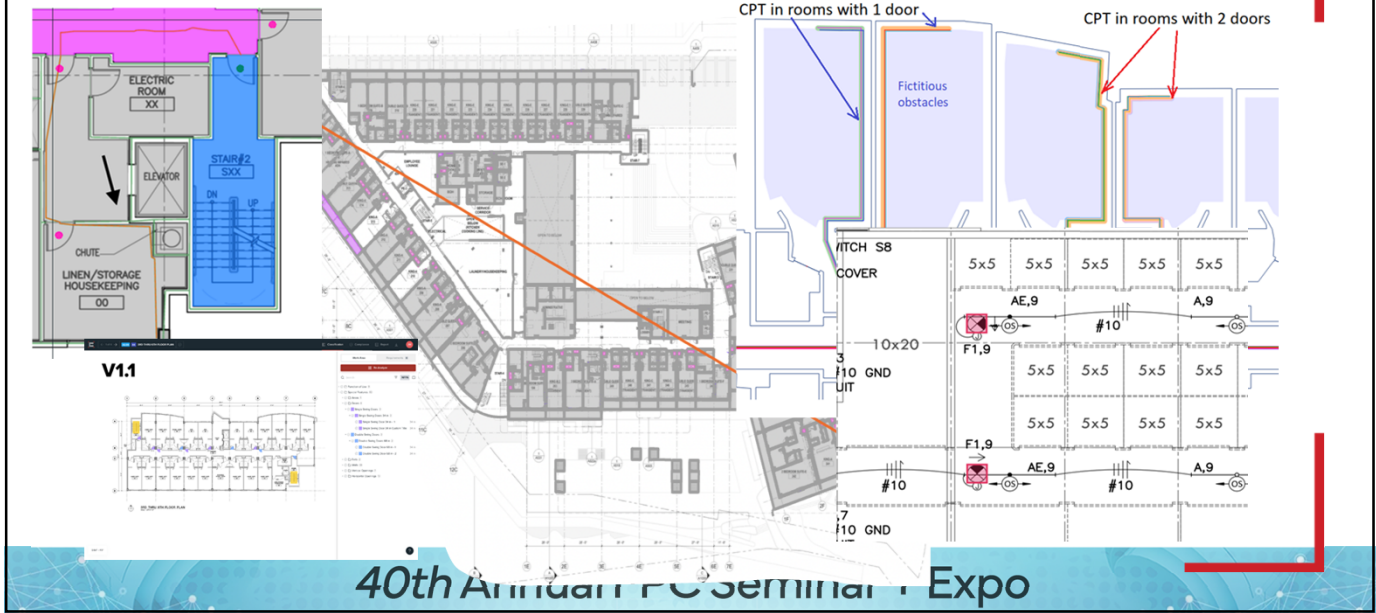


ISO/DIS 16739-1

Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries — Part 1: Data schema

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Training on 50,000+ Projects



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Programmer's Creed

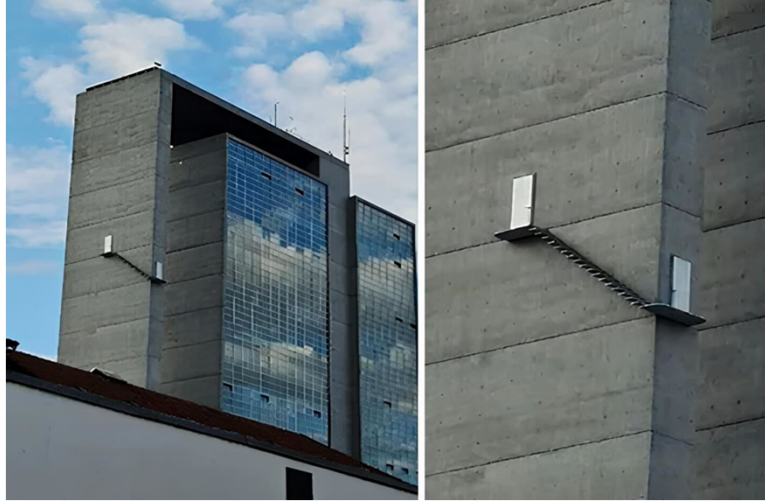
Piotr 4:36 AM
@Matthew Foley, stumbled upon this and it reminded me of the tests triage we did recently:
image.png



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Outlier Conditions



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2024 Conference Attendee Information – March 12-13

[ATTENDEE REGISTRATION](#)

[DOWNLOAD SCHEDULE BROCHURE](#) [DOWNLOAD EXHIBITOR BROCHURE](#)

Lineup of Seminars and Class Sessions for 2024

Tuesday Seminars March 12

8:30am – 4:30pm

Seminar 1 AM Session – Can you Hear Me Now, When You Need It...	(Seminar 2 was cancelled)	Seminar 3 Technology	Seminar 4 FSSA – Special Hazards Class <i>Todd Stevens, IFP, Al Thornton, Chemours, Chris Cavello, RAN Fire Protection and</i>
--------------------------------------------------------------------	---------------------------	-------------------------	--------------------------------------------------------------------------------------------------------------------------------------

Upcoming Events

- MAR March 12 - March 13
2024 SFPE GAC Annual Fire Safety Conference
- SEP 9:00 am - 4:30 pm

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Test Development

Test Number	Department	Test Category	Test	Status	User Value	Development Effort	Priority	Patent Order
1		Means of Egress	Occupant Load	Implemented	Very Important	Easy	1	FBC 1-10
2		Means of Egress	Egress Capacity	Implemented	Very Important	Moderate	3	FBC 100
3		Means of Egress	Travel Distance	Implemented	Very Important	Difficult	4	FBC 1-10
4		Means of Egress	Common Path of Travel	Implemented	Very Important	Difficult	4	FBC 1-10
5		Means of Egress	Dead End	Implemented	Very Important	Moderate	5	FBC 102
6		Means of Egress	Exit Separation on a Floor	Implemented	Very Important	Easy	5	FBC 100
7		Means of Egress	Exit Separation in a Room/Unit	Implemented	Very Important	Easy	5	FBC 100
8		Means of Egress	Door Swing	Implemented	Very Important	Easy	5	FBC 101
9		Means of Egress	Minimum Number of Exits	Implemented	Very Important	Easy	5	
10		Means of Egress	Horizontal/Vertical Sliding Doors	Implemented	Very Important	Moderate	5	FBC 101
11		Means of Egress	Exit Signs	Implemented	Very Important	Moderate	5	
12		Accessibility	Restroom Turning Clearance	Implemented	Very Important	Easy	5	3
13		Accessibility	Doors in Series	Implemented	Very Important	Easy	5	3
14		Accessibility	Water Closet Clearance	Implemented	Very Important	Moderate	5	4
15		Plumbing Systems	Plumbing Fixture Count	Implemented	Very Important	Moderate	5	5
16		Accessibility	Bathub-Shower Clearance	Implemented	Very Important	Moderate	5	4
17		Means of Egress	Maximum Door Leaf	Implemented	Important	Easy	5	
18		Means of Egress	Minimum Door Clear Width	Implemented	Important	Easy	5	
19		Means of Egress	Intervening Rooms	Implemented	Important	Moderate	4	FBC 101
20		Means of Egress	Interior Exit Stair Discharge	In progress	Important	Difficult	3	FBC 102
21		Means of Egress	Corridor Width	Implemented	Important	Easy	5	NFPA 10
22		Means of Egress	Stair Landing Width	Implemented	Important	Easy	5	
23		Fire Alarm System	Smoke Detector Spacing	Implemented	Very Important	Moderate	5	IBC 9.6
24		Fire Alarm System	Manual Pull Station Spacing	Queue	Very Important	Moderate	5	NFPA 72
25		Fire Alarm System	Audio/Visual Device Spacing	Needs Reqs	Very Important	Difficult	4	8
26		Fire Suppression	Sprinkler Head Spacing	Implemented	Very Important	Moderate	5	7
27		Fire Suppression	Fire Extinguisher Spacing	Implemented	Very Important	Moderate	5	FBC 906
28		Fire Suppression	Fire Sprinkler System Required	In progress	Important	Easy	5	7
29		Fire Suppression	Hazard Criteria	Implemented	Important	Moderate	4	7
30		Electrical Systems	Emergency Resistorless Radio Coverage	HOLD	Important	Moderate	4	6
31		Mechanical	Outside Air Calculations	In progress	Very Important	Moderate	5	6
32		Mechanical	Post-Fire Smoke Removal	HOLD	Important	Moderate	4	3
33		Mechanical	Clean Parking Clearance Requirements	HOLD	Important	Difficult	3	6
34		HVAC Systems	Pressurized Elevator Hallway Requirements	Implemented	Important	Easy	3	2
35		High-Rise Building	Fire Command Center (75+ feet)	Implemented	Important	Easy	3	FBC 911
36		Means of Egress	Smoke Compartment/Area of Refuge	Implemented	Not Important	Moderate	3	FFFC, NI
37		Means of Egress	Fire, Balustrade, Infant Wide	Implemented	Important	Moderate	4	

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AUTOMATING CODE COMPLIANCE WITH AI & ML

LIKES



- Numerical Values
- Object Detection
- Area Measurements
- Linear Measurement

DISLIKES

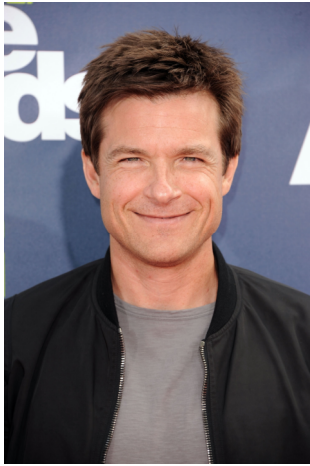


- Judgements
- Approximations
- Too Much Detail (But Getting Better)
- Performance Criteria

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```
FileInfo.com Example.json - Downloads
FileInfo.com Example.json
1 {
2   "users": [
3     {
4       "userId": 1,
5       "firstName": "Chris",
6       "lastName": "Lee",
7       "phoneNumber": "555-555-5555",
8       "emailAddress": "cleeg@fileinfo.com"
9     },
10    {
11     "userId": 2,
12     "firstName": "Action",
13     "lastName": "Jackson",
14     "phoneNumber": "555-555-5556",
15     "emailAddress": "sjackson@fileinfo.com"
16    },
17    {
18     "userId": 3,
19     "firstName": "Ross",
20     "lastName": "Bing",
21     "phoneNumber": "555-555-5557",
22     "emailAddress": "rbing@fileinfo.com"
23    },
24    {
25     "userId": 4,
26     "firstName": "David",
27     "lastName": "Reeves",
28     "phoneNumber": "555-555-5558",
29     "emailAddress": "dreeves@fileinfo.com"
30    },
31    {
32     "userId": 5,
33     "firstName": "Josie",
34     "lastName": "Mac",
35     "phoneNumber": "555-555-5559",
36     "emailAddress": "jmac@fileinfo.com"
37    }
38  ]
39 }
This is a .JSON file open in GitLab Atom. ©FileInfo.com
--DownloadsFileInfo.com Example.json 401  UTR:8 JSON onkub → Git (3)
```

Jason

Also Jason

JSON

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Tech Stack

- **Programming Languages:** JavaScript is the core language for development.
- **Backend:** The backend is built on Node.js, with KOA as the framework.
- **Database:** PostgreSQL is used as the relational database management system.
- **Vectorization Service:** A service built with Python and C++ for analyzing floor plans.
- **Cloud Services:** Amazon Web Services (AWS) is used for scalable and secure cloud infrastructure.

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Tech Stack for Matt, Robert, and other FPEs

- **Programming Languages:** JavaScript is the core language for development.
 - *JavaScript is like a multi-tool that allows us to create interactive elements in our software.*
- **Backend:** The backend is built on Node.js, with KOA as the framework.
 - *Node.js is the engine that keeps our software running smoothly for our users.*
- **Database:** PostgreSQL is used as the relational database management system.
 - *PostgreSQL acts as our digital filing system for our data.*
- **Vectorization Service:** A service built with Python and C++ for analyzing floor plans.
 - *We use a custom tool, built with Python and C++, to quickly understand and process building layouts.*
- **Cloud Services:** Amazon Web Services (AWS) is used for scalable and secure cloud infrastructure.
 - *AWS gives us an expandable space on the internet to keep our software operational.*

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Feature Request – LLM Applications

what is the scope of this project?

The scope of this project involves the construction of a two-story office/warehouse facility for Peterman Heating, Cooling, and Plumbing, located in Greenwood, Indiana. The proposed development includes a building area of 38,425 square feet (footprint), internal parking lot area of 48,072 square feet, landscaping, and stormwater management systems. The project will involve various construction activities such as earthwork, utility installation, paving, landscaping, and installation of mechanical, electrical, and plumbing systems. The contractor will be responsible for complying with all local codes, ordinances, and regulations, obtaining necessary permits, coordinating with other trades, and ensuring the proper functioning of all systems upon completion.

WHAT INFORMATION CAN YOU GIVE ME ON THE DOORS?

The project includes various types of doors, such as: 1. Wood doors: These are pre-finished solid core wood doors with sizes like 3'-0" x 7'-0" x 1-3/4". Some doors have 1/4" tempered glass panels. 2. Hollow metal doors and frames: These are pre-finished knock-down hollow metal frames with sizes like 3'-0" x 7'-0" x 1-3/4". 3. Aluminum doors and frames: These are thermally broken aluminum frames with insulated glass panels. 4. Overhead sectional doors: These are insulated sectional overhead doors for warehouse and exterior applications. The doors are equipped with various hardware sets, including hinges, locks, closers, and weatherstripping. Some doors also have specific accessibility features, such as lever handles and keying systems coordinated with the owner. Access doors are provided in ceilings and walls where necessary for maintenance and access to concealed equipment. For more detailed information on doors, refer to the Door Schedule and Door Hardware Schedule sections in the provided context.

WHATS THE FINISH FOR ALL UNIT ENTRY DOOR?

The finish for all unit entry doors is not explicitly mentioned in the provided context. However, it is mentioned that wood doors are pre-finished solid core, and hollow metal doors and frames are pre-finished as well. For more specific information on the finish of the unit entry doors, you may need to refer to the project specifications or consult with the project architect or owner.

Query Project Specifics

Analyze information from cover sheet, title block, and annotations

Connection with Internal Databases

Customize your own internal database for FAQ responses from your experts

Potential Third-Party Integrations

Potentially integrate with third-party LLMs for access to copyrighted information

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User Request – Training Resources

Introduction and Overview

We will explore the CodeComply.AI interface of the platform and its capabilities.

[Get started >>](#)

Project Creation & Management

In this module, we will gain an understanding of CodeComply.AI. You will learn how to create, understand of the sharing feature within on your plans.

[Get started >>](#)

AI Vectorization & Editing

We will explore the core of the Artificial as well as its editing capabilities. You will analyze, and functions or use of space.

[Get started >>](#)

Compliance Assessments

This module explores the extensive gain an understanding of the results, underlying the assessment.

[Get started >>](#)

Commenting and Reporting

Once the compliance assessments are completed, commenting features within the platform.

[Get started >>](#)

Seamless Onboarding

Video tutorials and reference guides to get started with your new software

Educational Resource

Learn the fundamentals of codes and standards as you support your team on real projects

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Code Academy – Online User Training

Access knowledge tracks, including written and video tutorials, built by our team of experts. Code Academy is built to support your use of the platform, while providing education on code compliance.



Code Academy

Our team of subject matter experts have collaborated to design the essential knowledge tracks to not only support your use of the CodeComply.AI platform, but to provide education on the fundamental aspects of code compliance.

Getting Started Guide – Fundamentals of CodeComply.AI

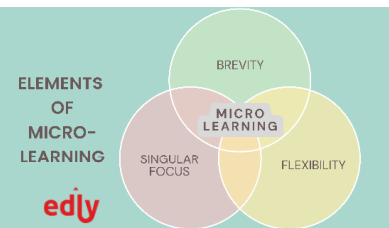
Educate. Innovate. Comply.

CodeComply.AI

Getting Started with CodeComply.AI – Fundamentals

The fundamentals of CodeComply.AI will provide you with an overview of our platform – front to back. It will explore all major functionality and provide you with the foundation to continue your learning.

CodeComply.AI
Getting Started: Fundamentals

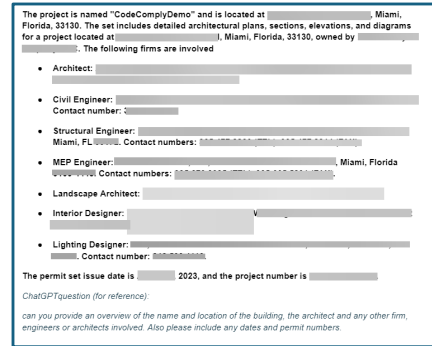
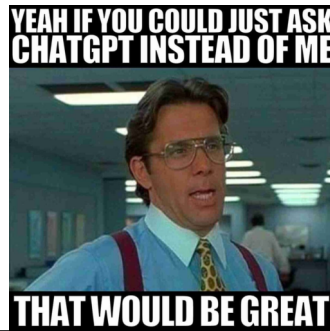


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User Request – Project Info/Summary

- Design Team
- Referenced Codes
- Occupancy Classification Used
- Building Height (Elevation/# of Stories)
- Setback/FSD
- Lot size
- Parking Spaces
- Plumbing Fixture Count



Query Plans Using Chat GPT

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Implementation Strategy

Early Stage: Establish deep integration with building departments across jurisdictions to drive widespread adoption.

User Licenses: Attract architects and design, introducing individual licenses for single users and tiered pricing for enterprise clients.

Per-Project Pricing: Transition to per-project pricing in select communities to align with current permitting process.



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Confidently Incorrect or Incomplete

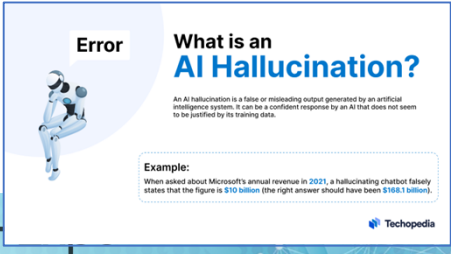
You
what is the common path of travel allowed by the building code for a school?

ChatGPT
The common path of travel allowed by building codes for a school will depend on the specific code requirements in your jurisdiction. In general, building codes for schools are designed to ensure that the building is safe and accessible for students, staff, and visitors.

According to the International Building Code (IBC), the common path of travel is defined as the "path within a building from a point of entry to an occupied space and the path from one occupied space to another occupied space." This path should be unobstructed and provide sufficient space for the intended use of the building.

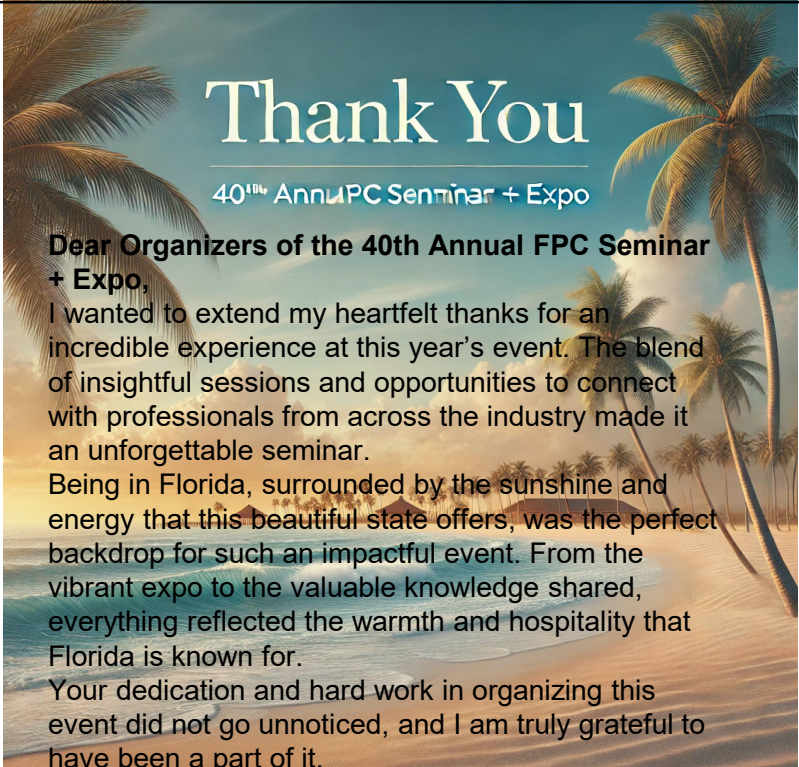
You
Is there a distance limit on this?

ChatGPT
Building codes generally do not specify a specific distance limit for the common path of travel within a school building. Instead, they focus on ensuring that the pathways are designed and constructed to provide safe and efficient movement for occupants throughout the building. The emphasis is on factors such as width, accessibility, clearances, obstructions, signage, and lighting rather than on a specific distance limit.



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Thank You

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Dear Organizers of the 40th Annual FPC Seminar + Expo,

I wanted to extend my heartfelt thanks for an incredible experience at this year's event. The blend of insightful sessions and opportunities to connect with professionals from across the industry made it an unforgettable seminar.

Being in Florida, surrounded by the sunshine and energy that this beautiful state offers, was the perfect backdrop for such an impactful event. From the vibrant expo to the valuable knowledge shared, everything reflected the warmth and hospitality that Florida is known for.

Your dedication and hard work in organizing this event did not go unnoticed, and I am truly grateful to have been a part of it.



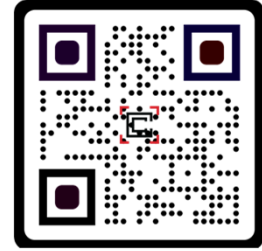
DALL·E

By ChatGPT

ChatGPT 4o

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AI-BASED REVIEW TOOL
TECHNOLOGY

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Thank you for your attention!

