Recap of Laser Scanning: Existing and Historic Structures with New Design

Will Ikerd, PE (TX)

Principal

http://www.linkedin.com/in/wikerd

IKERD CONSULTING

- Started in 2003
- Will Ikerd began graduate work in 3D in mid-90s. UNT Alumni from UNT TAMS w/ Office in Denton
- 3 Areas of Focus:
  - DESIGN & CONSTRUCTION CONSULTING: Structural, Energy, Civil, Enclosures
  - TECHNOLOGY: Virtual Design & Construction with BIM
  - TRAIN: Technology Implementation

Washington University in St. Louis

Mid-90s Graduate Work in Parametric Structural Engineering of Buildings with EDI

BIMFORUM

Chair the Designers Subforum

Co-Chair of the SEI – CASE Joint Committee on BIM
Chair Sub-Committee on Dev., Soft. & Train.

Committee member of IT Committee
Focused on BIM & IPD in Steel

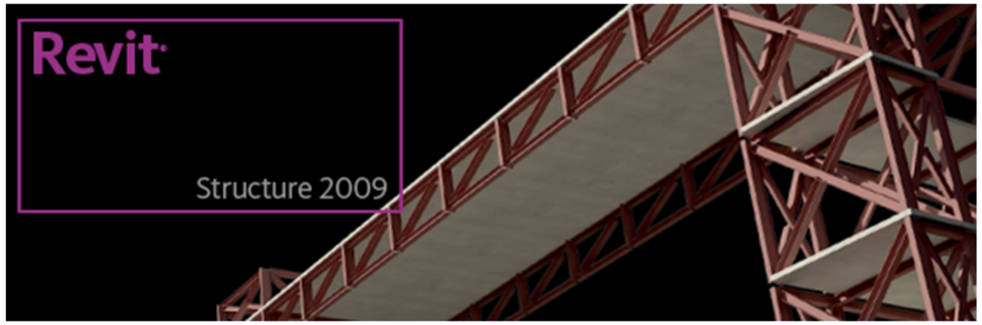
American Concrete Institute

ACI

2007, 2008, 2010, 2012, 2013 Presented on integrated structural engineering in BIM (w/ Revit Structure)

Authored Autodesk Educational Curriculum for Structural 2007, ’09, ‘13

Revit Structure 2009 Curriculum



27

Revit Structure Building Information Modeling Curriculum

Ensure success by leveraging professionally developed instructor guides, student workbooks, and datasets that seamlessly integrate into your curriculum to enable you to teach Revit Structure for building information modeling (BIM). Use interactive videos which support critical learning. With Revit Structure, students explore structural modeling and design while learning sophisticated analysis techniques to prepare them for careers in structural engineering.

Instructor Guide

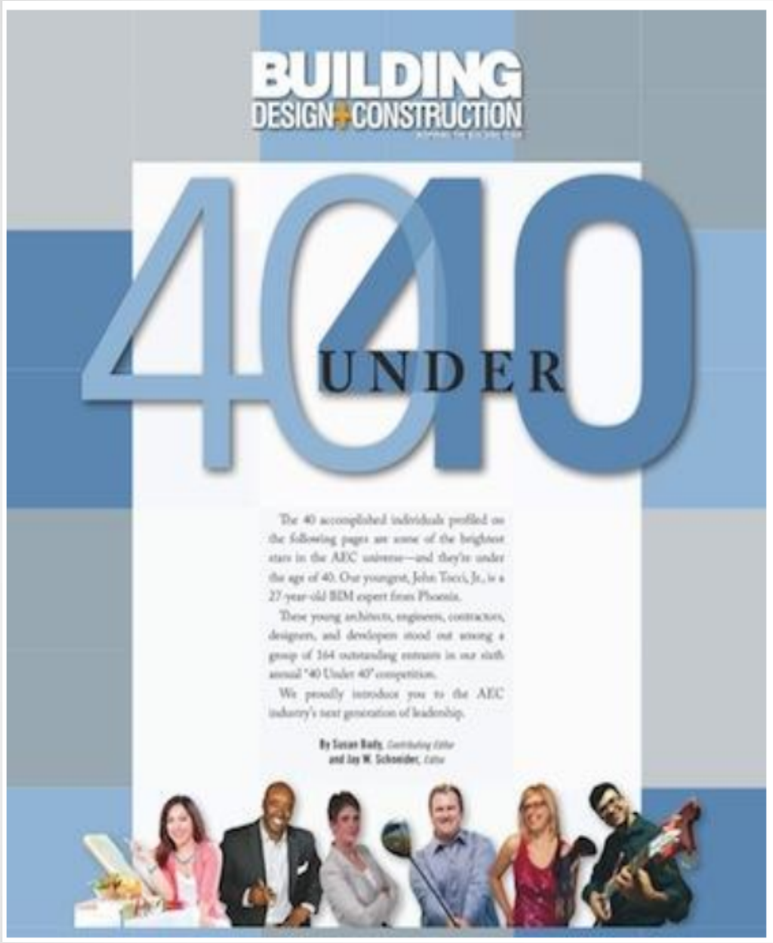
The Instructor Guide contains comprehensive lecture notes to teach the principles of BIM using Revit Structure.

- Instructor Guide

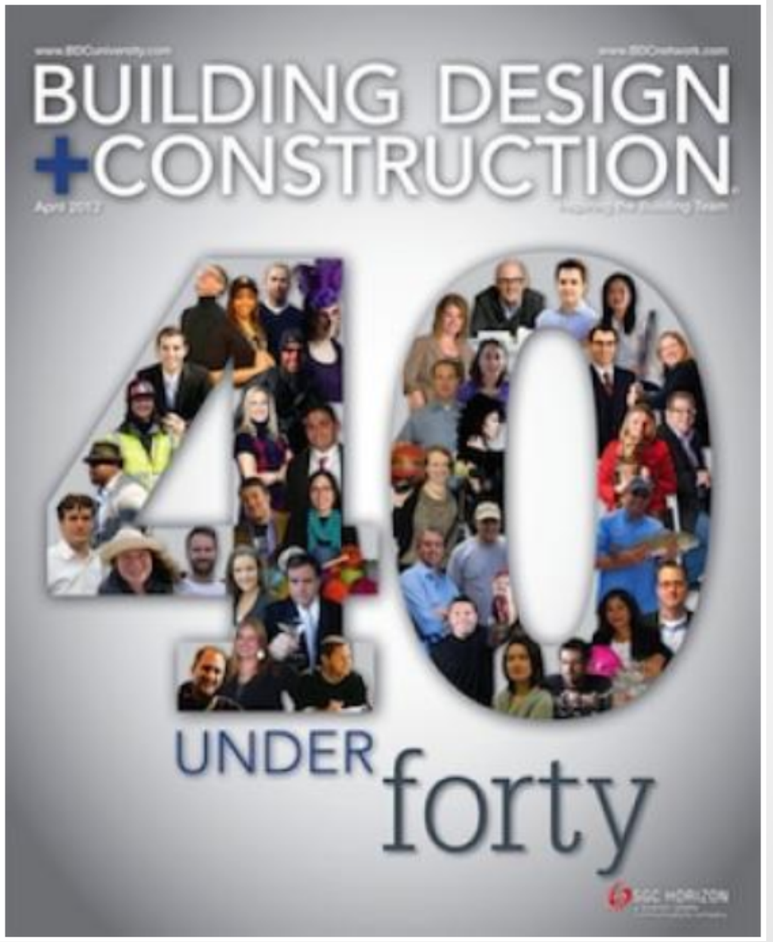
Additional Resources

- Techsmith TSCC Codec
- BIM in Education Video (WMV)
- White Papers
- List of Analysis Partners
- Revit Architecture BIM Curriculum

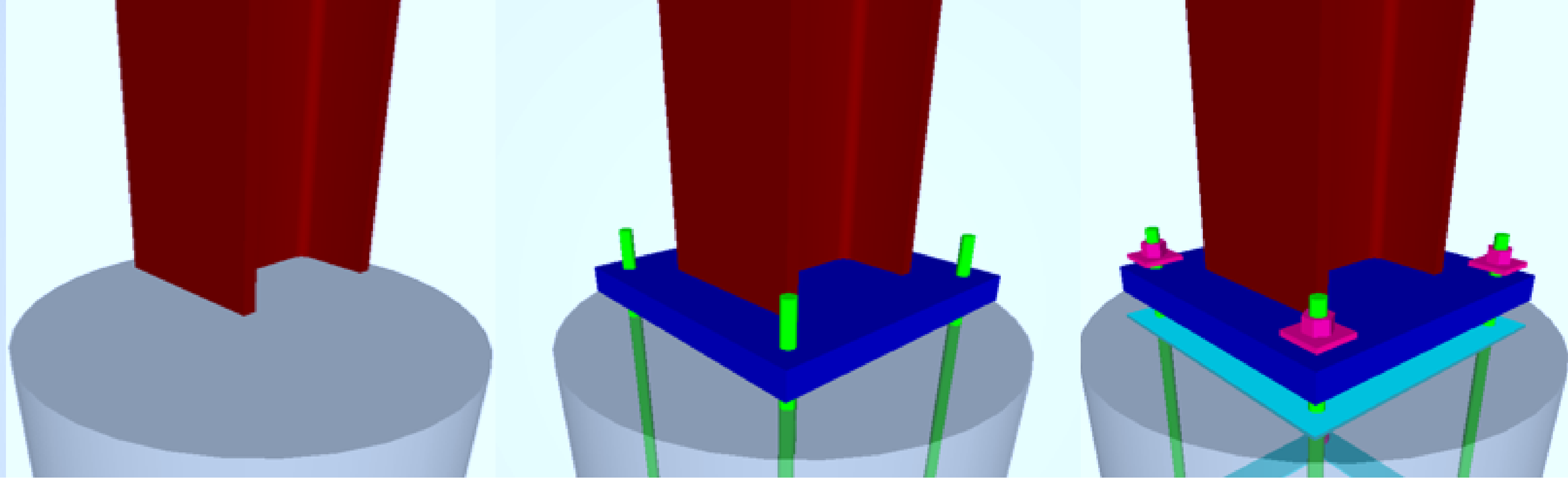
2011


BUILDING
DESIGN+CONSTRUCTION
40 UNDER 40
The 40 accomplished individuals profiled on the following pages are some of the brightest stars in the AEC universe—and they're under the age of 40. Our youngest, John Tocci, Jr., is a 27-year-old BIM expert from Phoenix.
These young architects, engineers, contractors, designers, and developers stood out among a group of 364 outstanding entrants in our sixth annual "40 Under 40" competition.
We proudly introduce you to the AEC industry's next generation of leadership.
By Susan Bady, Contributing Editor
and Jay W. Schneider, Editor

2012

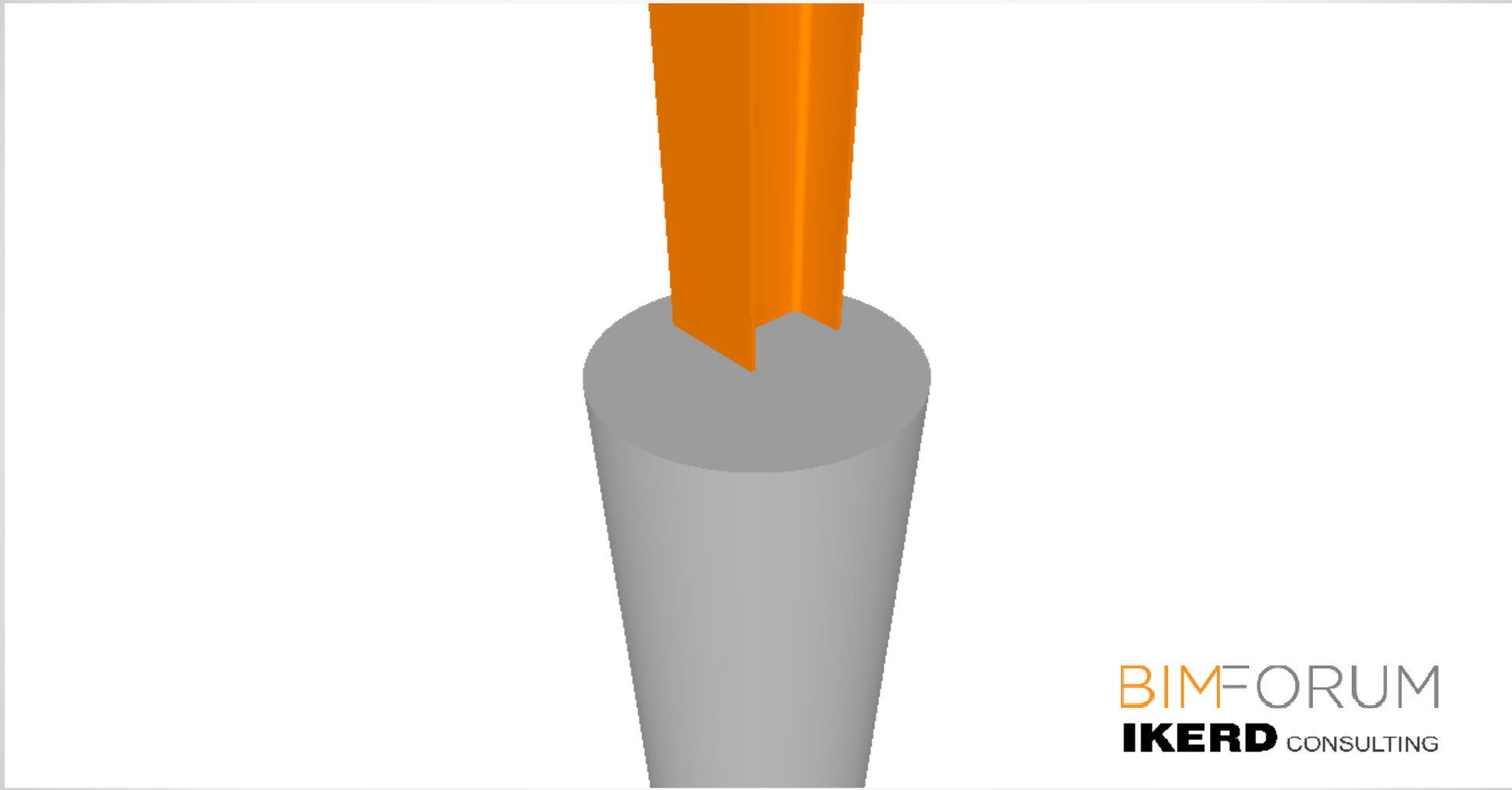

BUILDING DESIGN
+CONSTRUCTION
UNDER forty

Best Practices

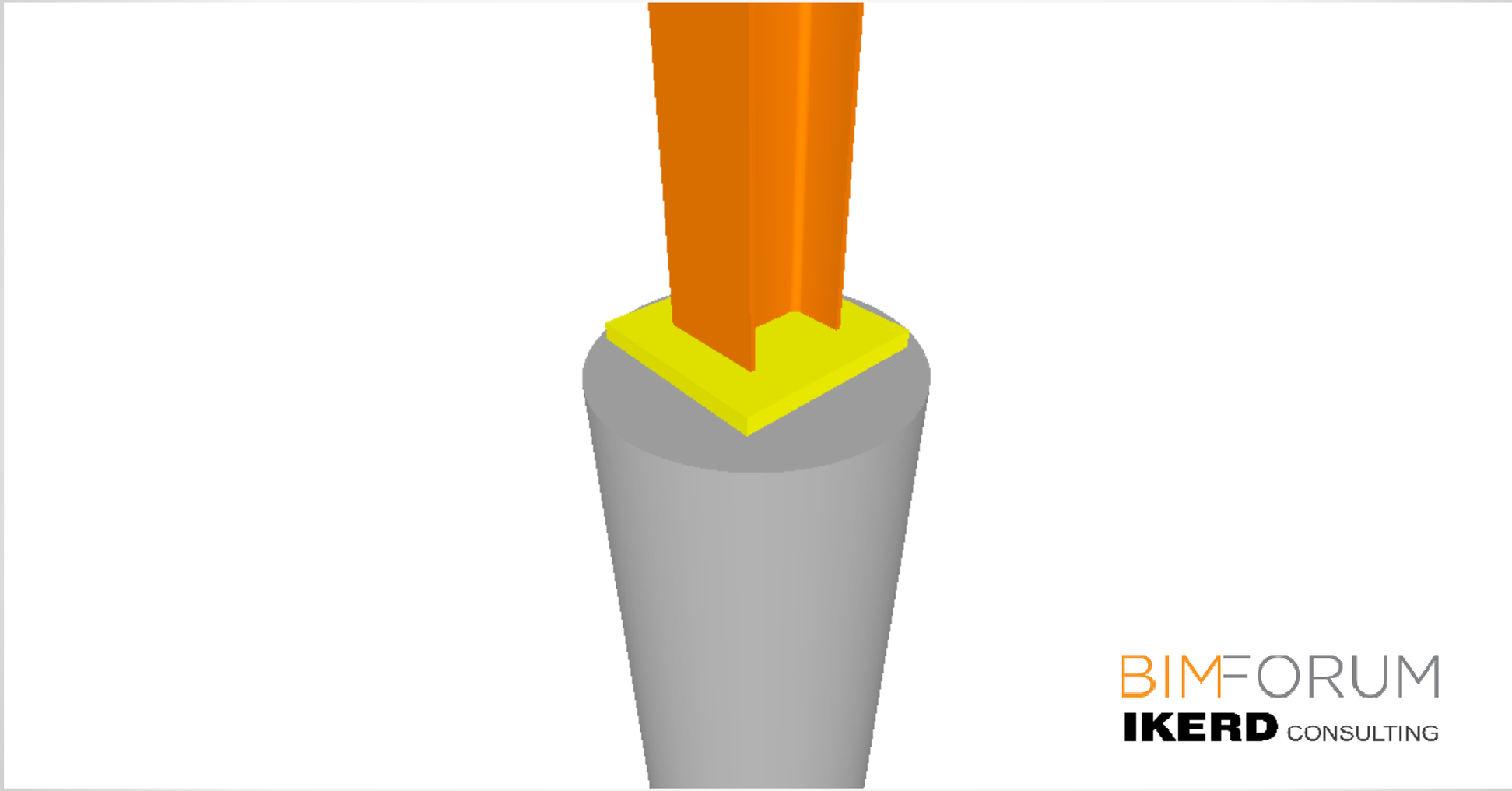


Level Of Development

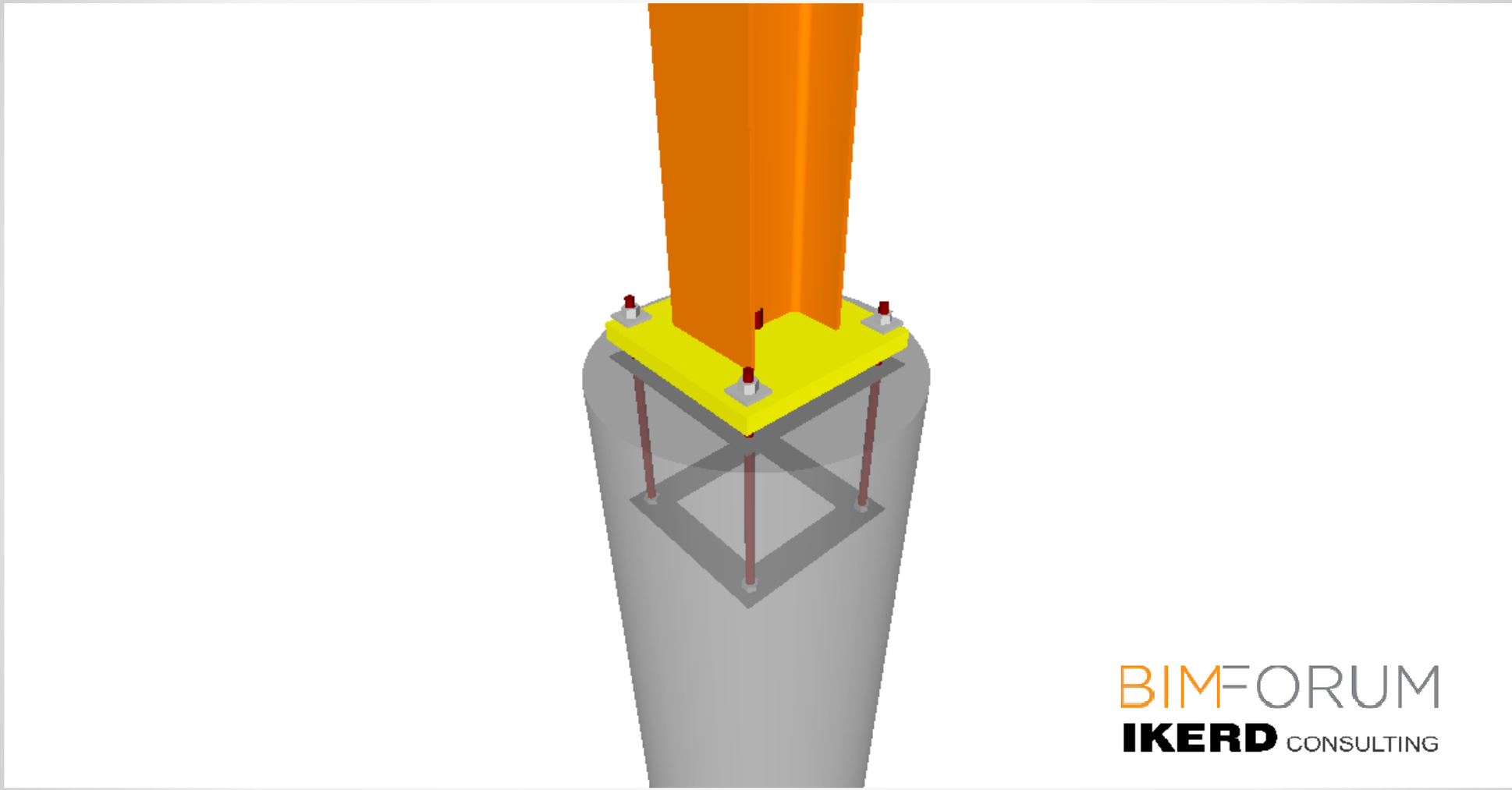
BASE PLATE LOD 300



BASE PLATE LOD 350

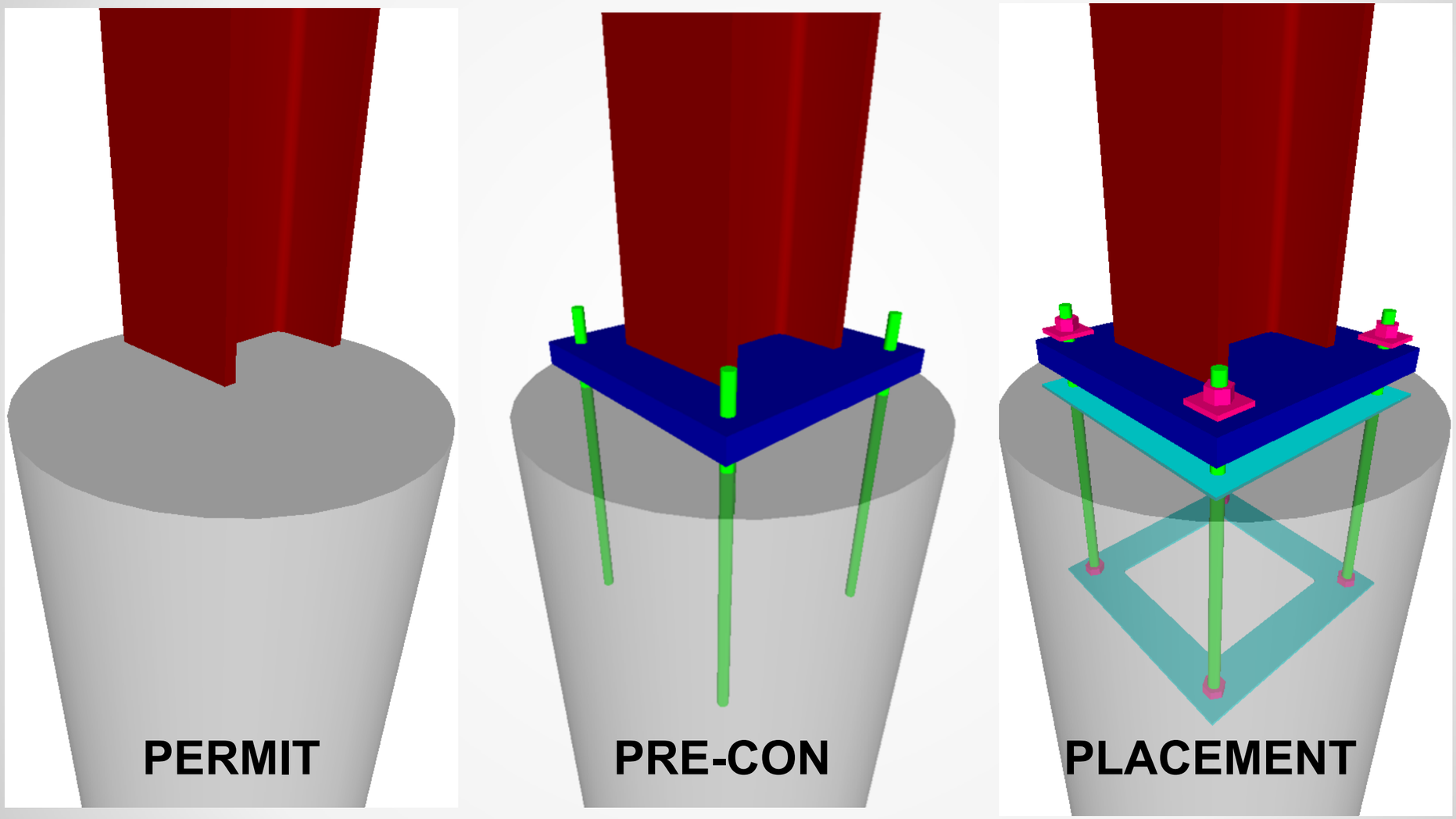


BASE PLATE LOD 400



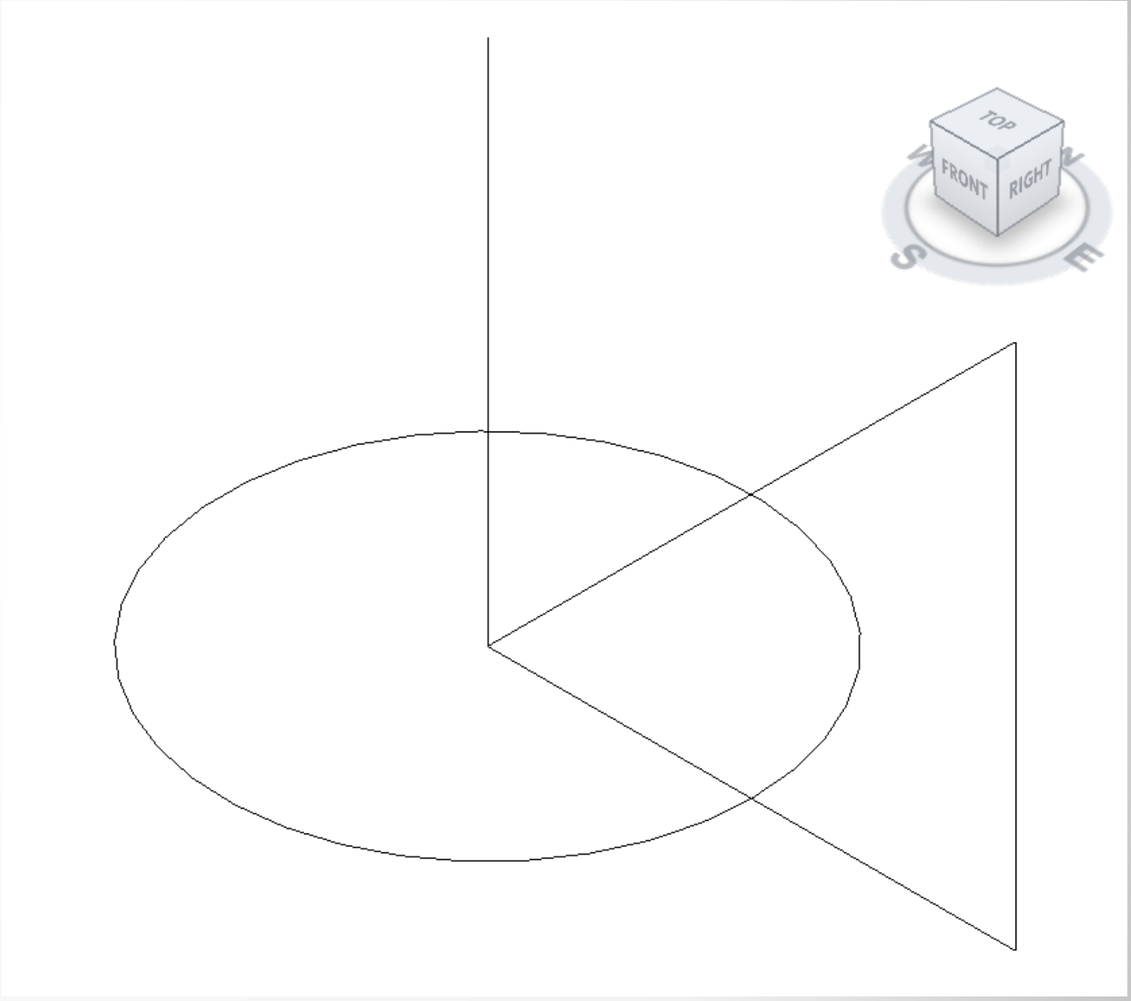
BIMFORUM
IKERD CONSULTING

300 → 350 → 400



Tip: Expose Origin In Revit

1. Receive the Origin File in CAD
2. Create a Revit Template RVT file.
3. Link in CAD Origin to Origin
4. Clash detection



OLD IS NEW …..

I Say:

"A picture is worth

….

You Say:

"A Thousand

Words!"

OLD IS NEW …..

I Say:

"Measure Twice and

. . . .

You Say:

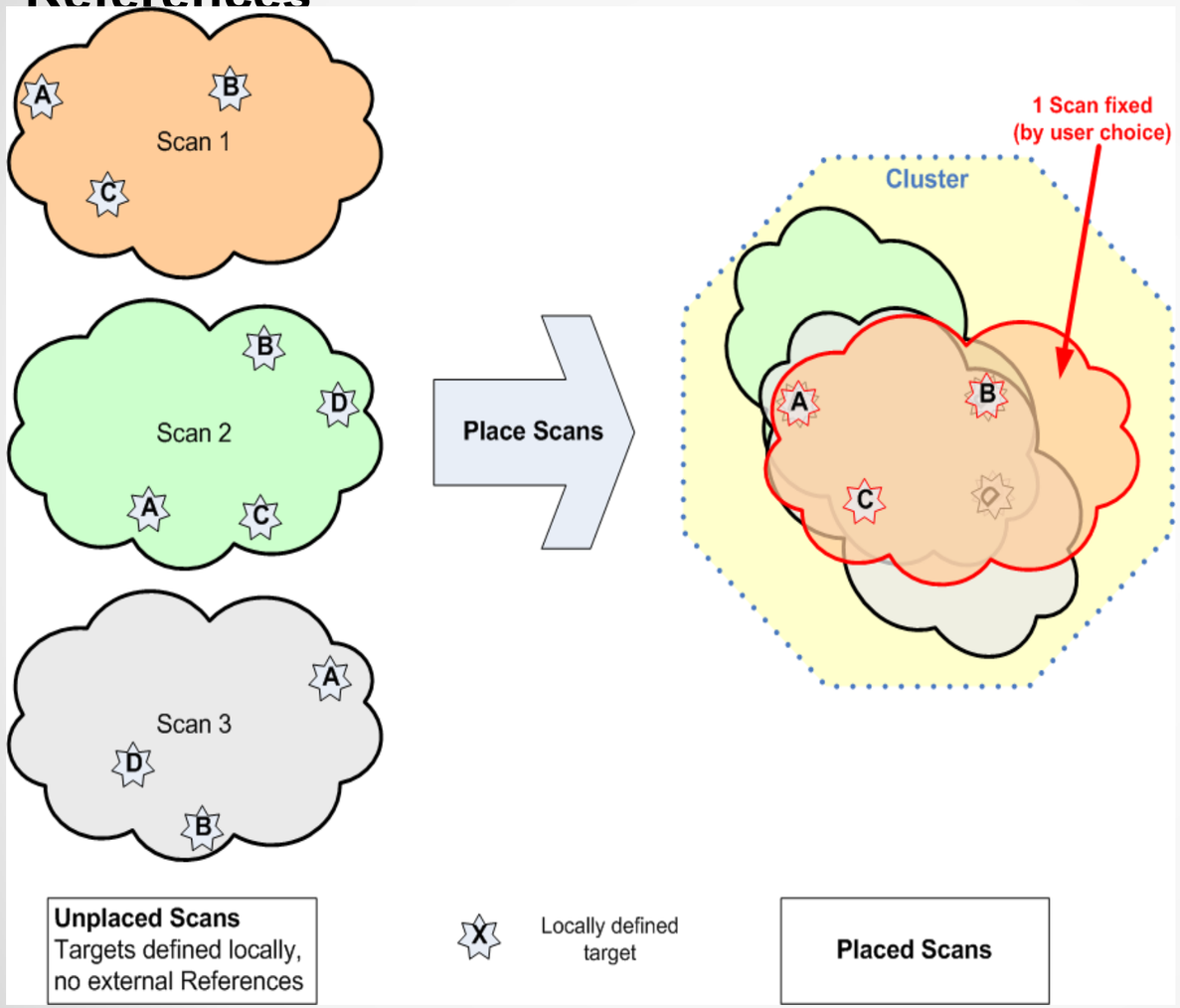
"… Cut Once !"

Scanner set up and Targeting


101

Cloud to Cloud Registration

Cluster Registration (Bundle Block Adjustment) – no external References



Bundle Block Adjustment is applied to balance the tensions

Tobin Center for the Performing Arts

San Antonio's historic Municipal Auditorium, built in 1926, is an iconic venue that has served an illustrious tradition of cultural events and civic celebrations. The addition/renovation project will continue its legacy and embellish the creative energy of the facility into the life of the City.

Location

San Antonio, Texas

Status

Estimated completion Spring 2014

Size

157,000 sf; 1,750 seats

Associate Architect

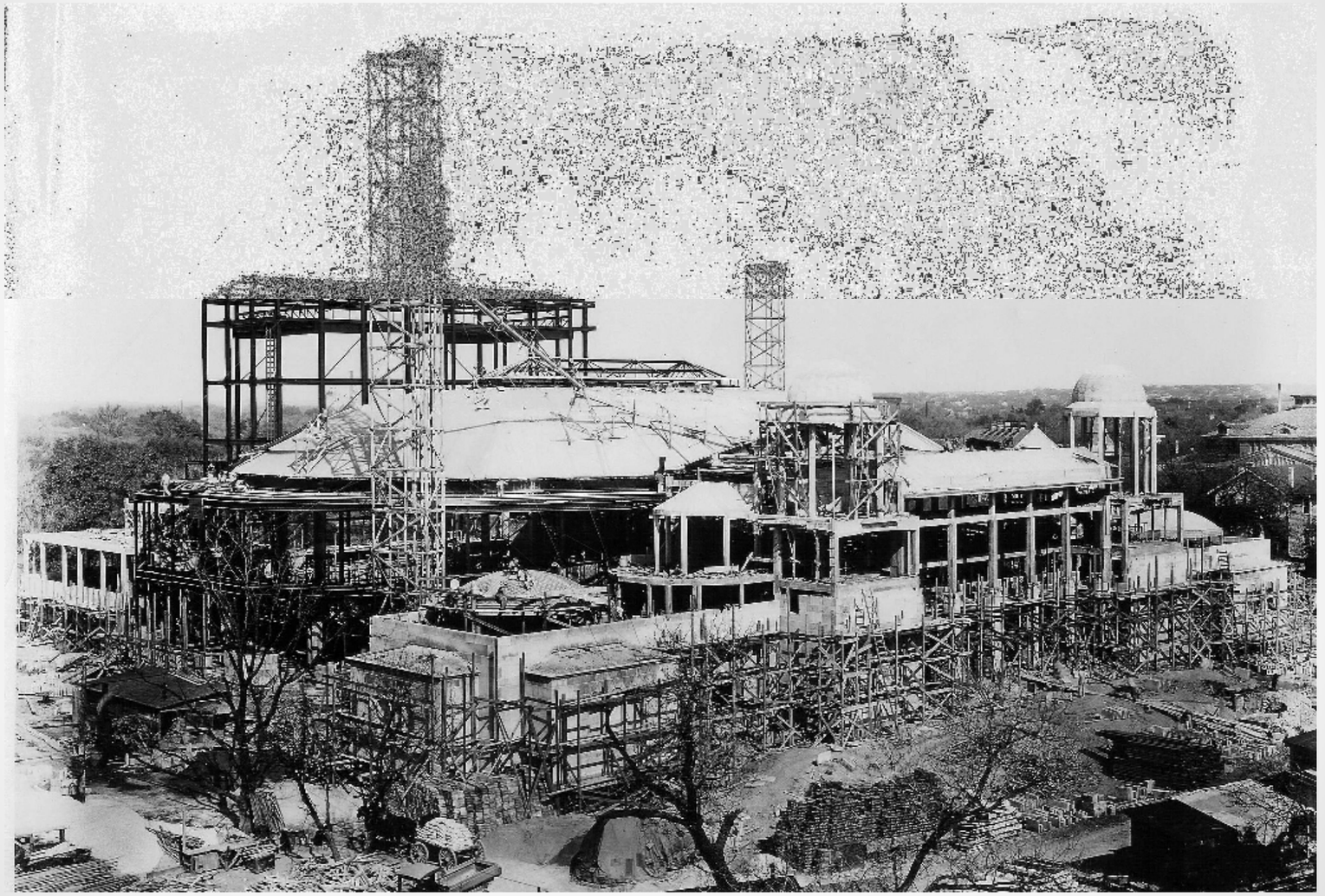
Marmon Mok

Select Awards

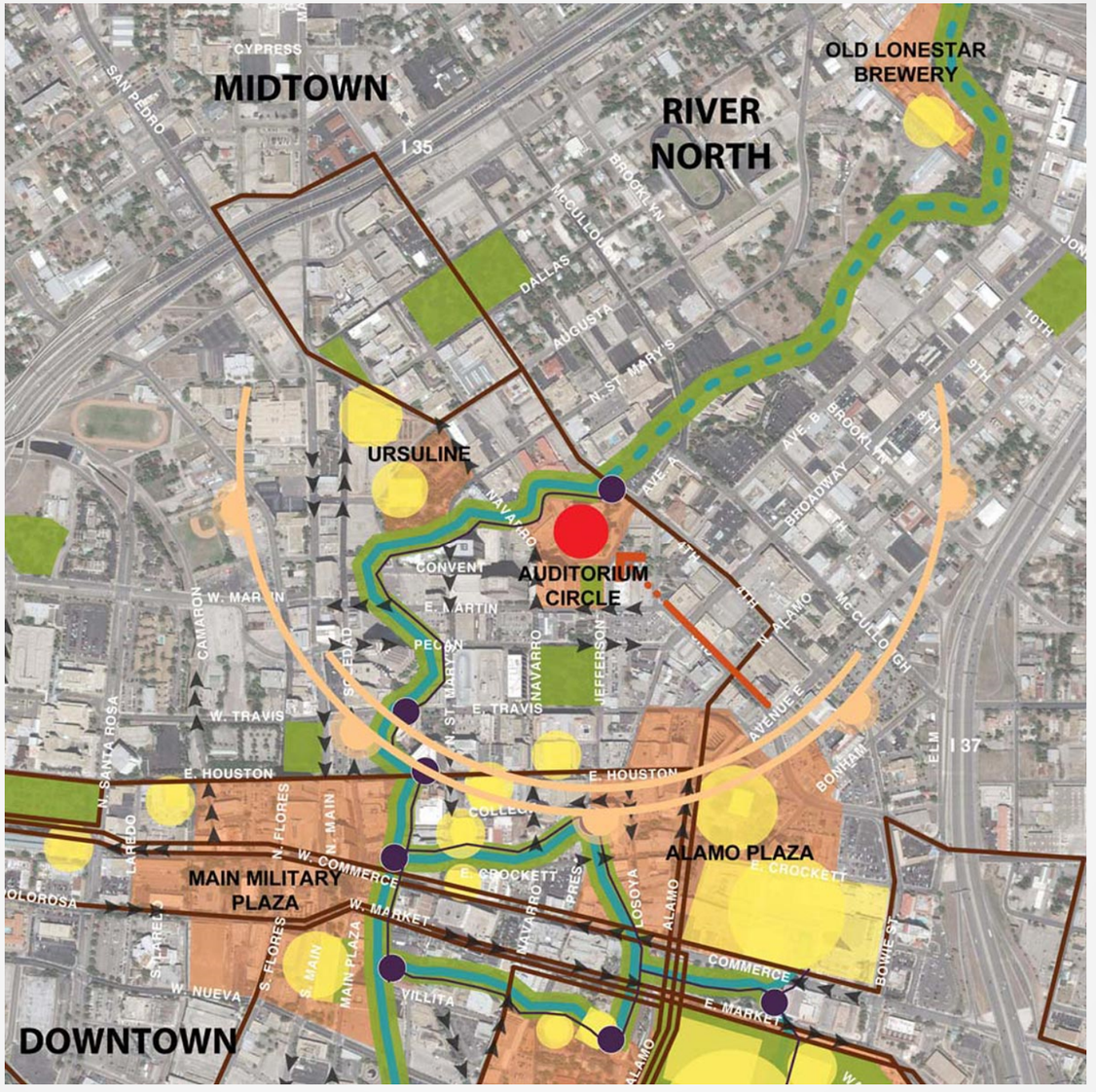
2012 AIA Civic Design Awards, Citation, Unbuilt Category

LMN LINBECK WALTER P MOORE

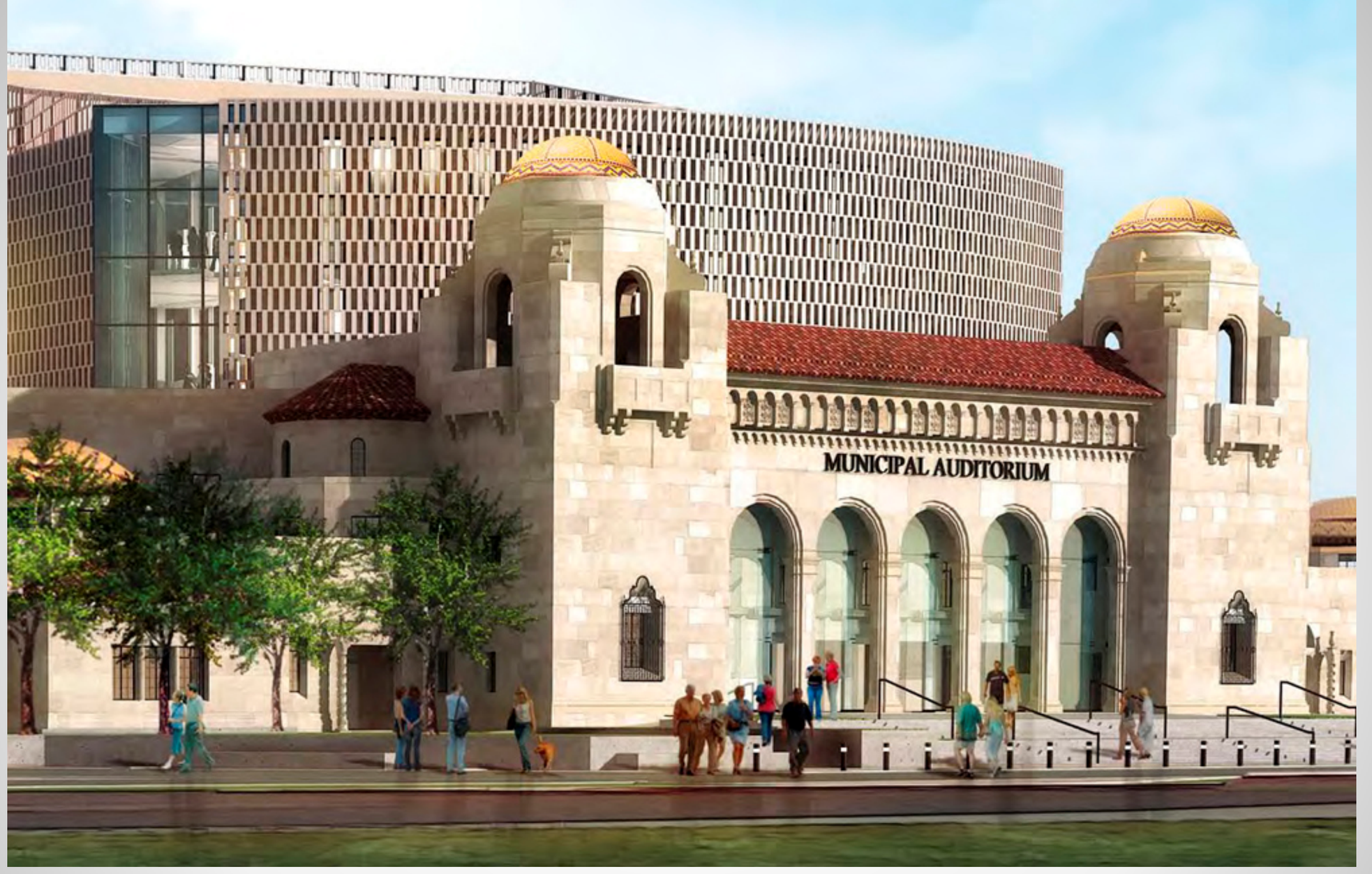
Tobin Center for the Performing Arts




TOBIN

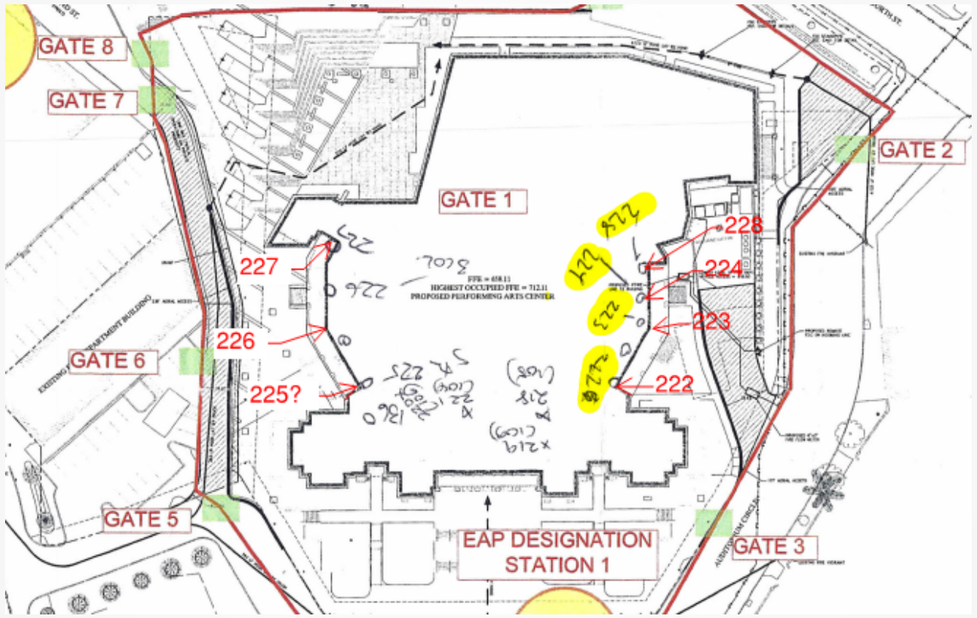

MIDTOWN
RIVER NORTH
OLD LONESTAR BREWERY
URSULINE
AUDITORIUM CIRCLE
ALAMO PLAZA
MAIN MILITARY PLAZA
DOWNTOWN
I 35
I 37
CYPRESS
SAN PEDRO
DALLAS
AUGUSTA
N. ST. MARY'S
BROOKLYN
McCULLOUGH
AVE. B
AVE. A
BROADWAY
10TH
9TH
8TH
7TH
6TH
CONVENT
NAVARRO
W. MARTIN
E. MARTIN
PECAN
CAMARON
W. TRAVIS
E. TRAVIS
JEFFERSON
N. ALAMO
AVENUE E
BONHAM
ELM
E. HOUSTON
N. SANTA ROSA
LAREDO
N. FLORES
N. MAIN
W. COMMERCE
E. CROCKETT
W. MARKET
PRESA
LOSOYA
ALAMO
COMMERCE
E. MARKET
BOWIE ST.
S. FLORES
S. MAIN
MAIN PLAZA
W. NUEVA
VILLITA
S. LAREDO


MUNICIPAL AUDITORIUM


MUNICIPAL AUDITORIUM


TOBIN
CENTER
FOR THE
PERFORMING ARTS
SPRING 2014
DO NOT
ENTER

Site Planning

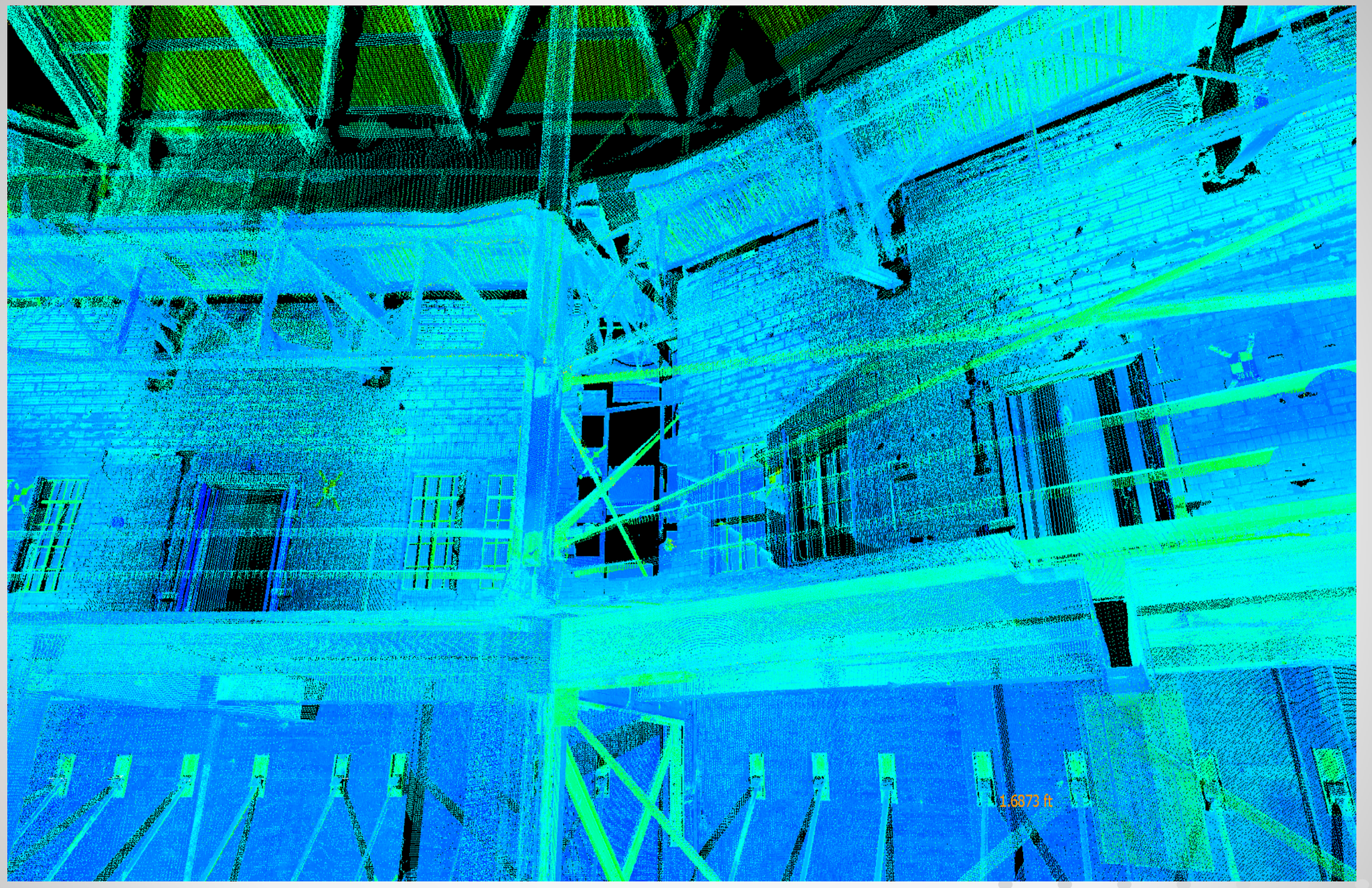


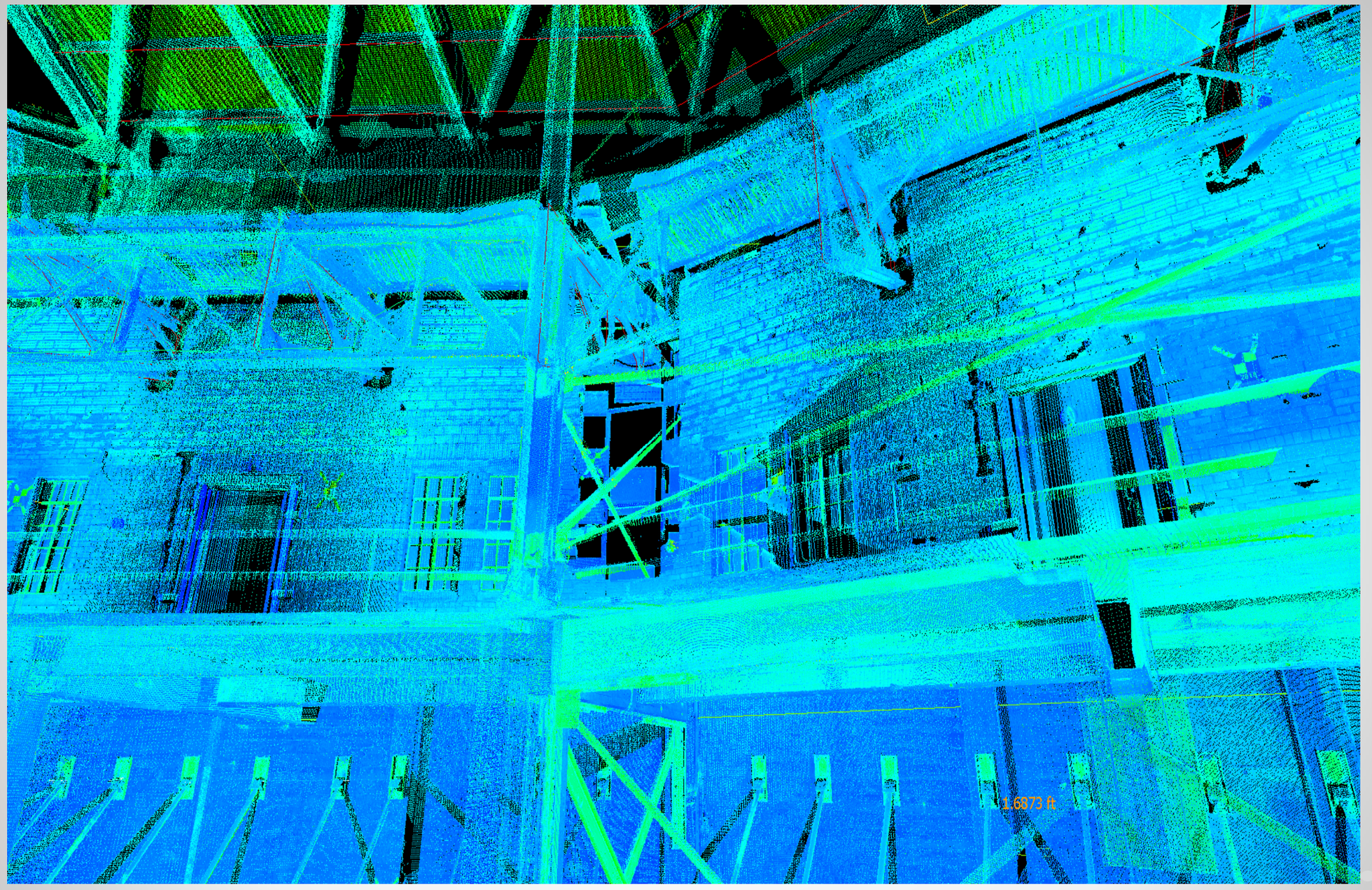

228
224
223
222


225
226
227

Point	Ref. Image	Close Up Image
222 Point at Reflector: (1/2" from face of target/column): X = 2131668.60350 Y = 13706754.94410 Z = 646.64000 **Target point:** **X = 2131668.63967** **Y = 13706754.92342** **Z = 646.64000**		
223 Point at Reflector: (1/2" from face of target/column): X = 2131686.18150 Y = 13706785.83680 Z = 647.44000 **Target point:** **X = 2131686.22179** **Y = 13706785.82619** **Z = 647.44000**		


2021
2020
2019


1.6873 ft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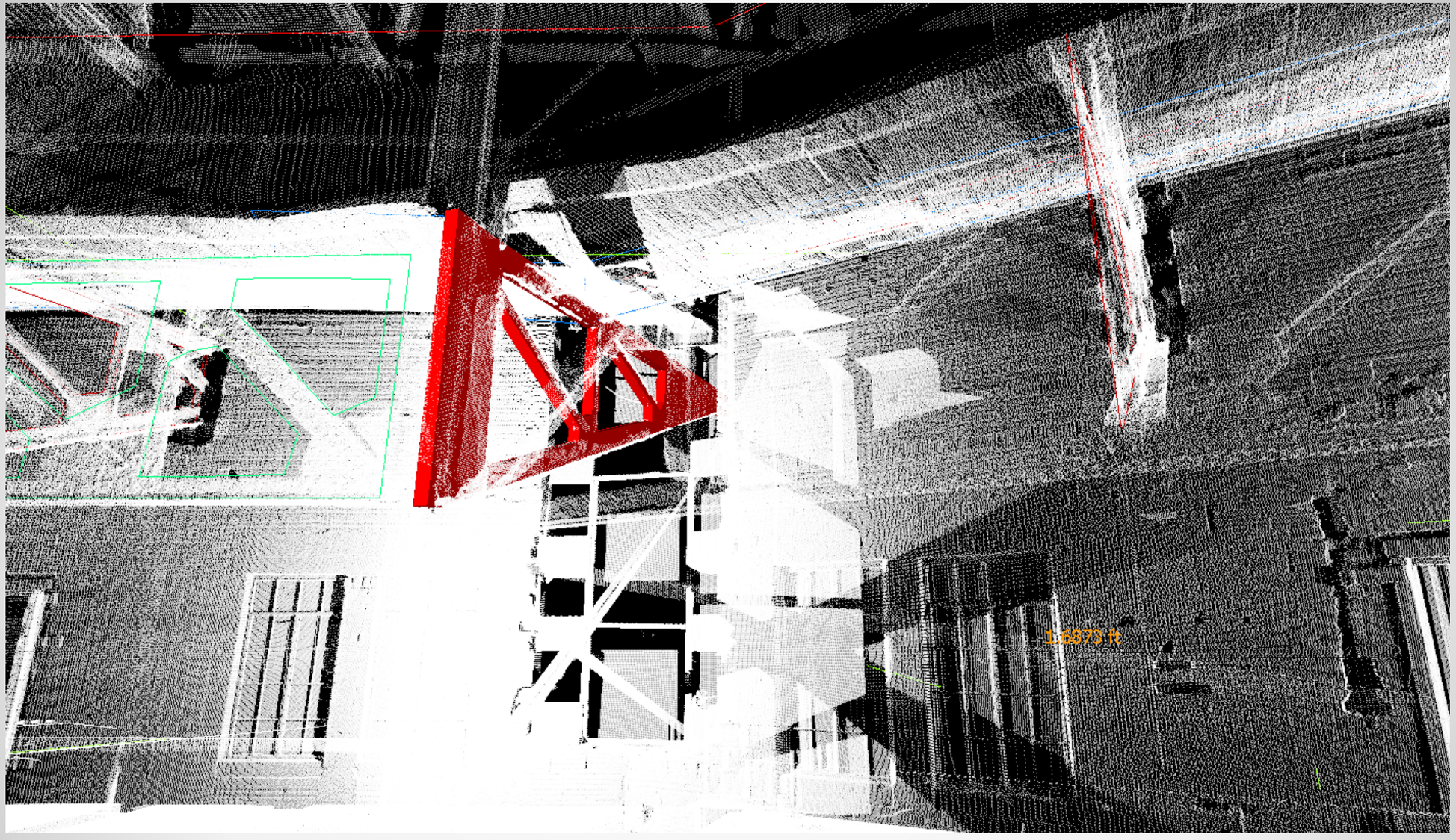
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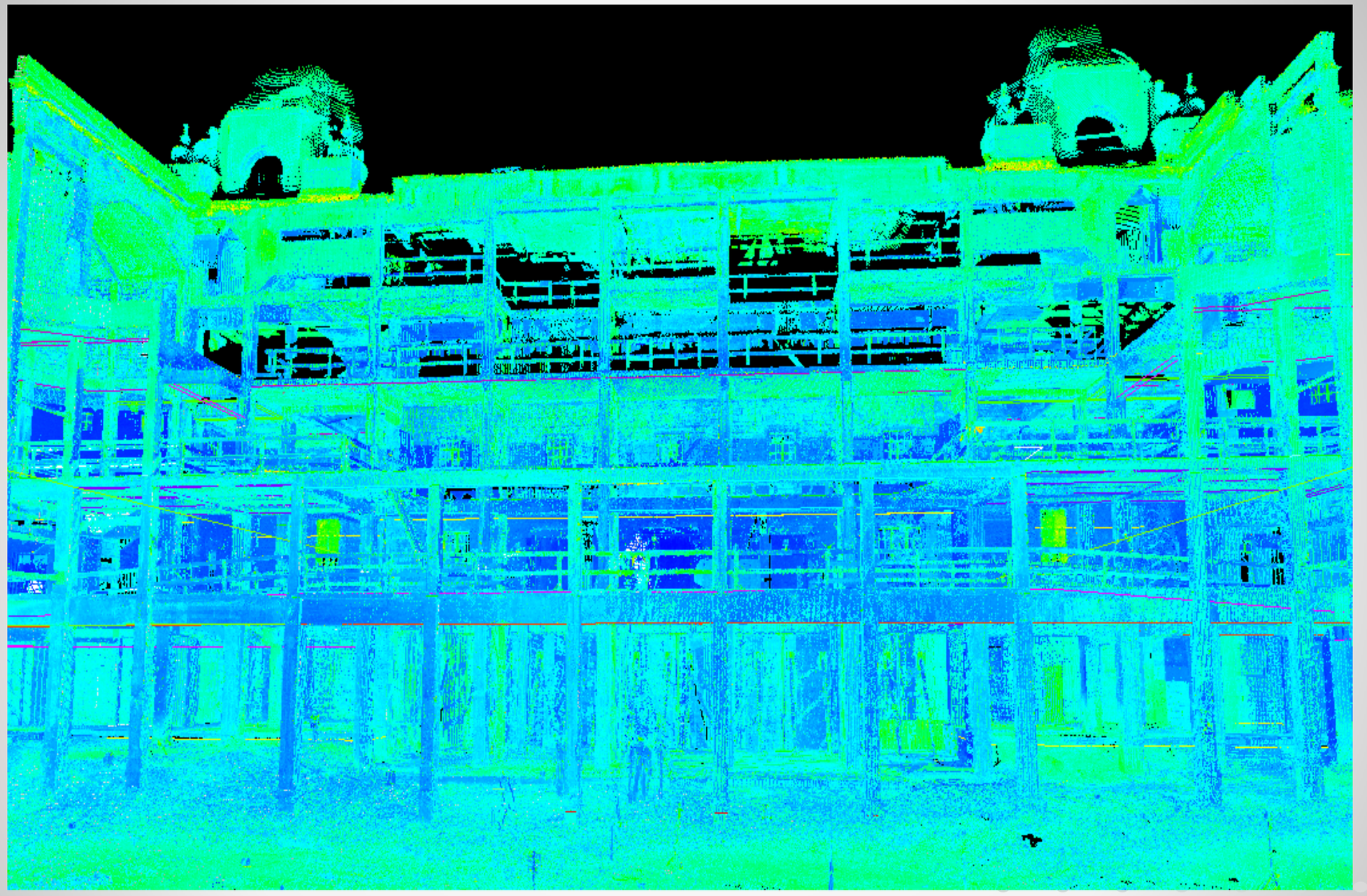
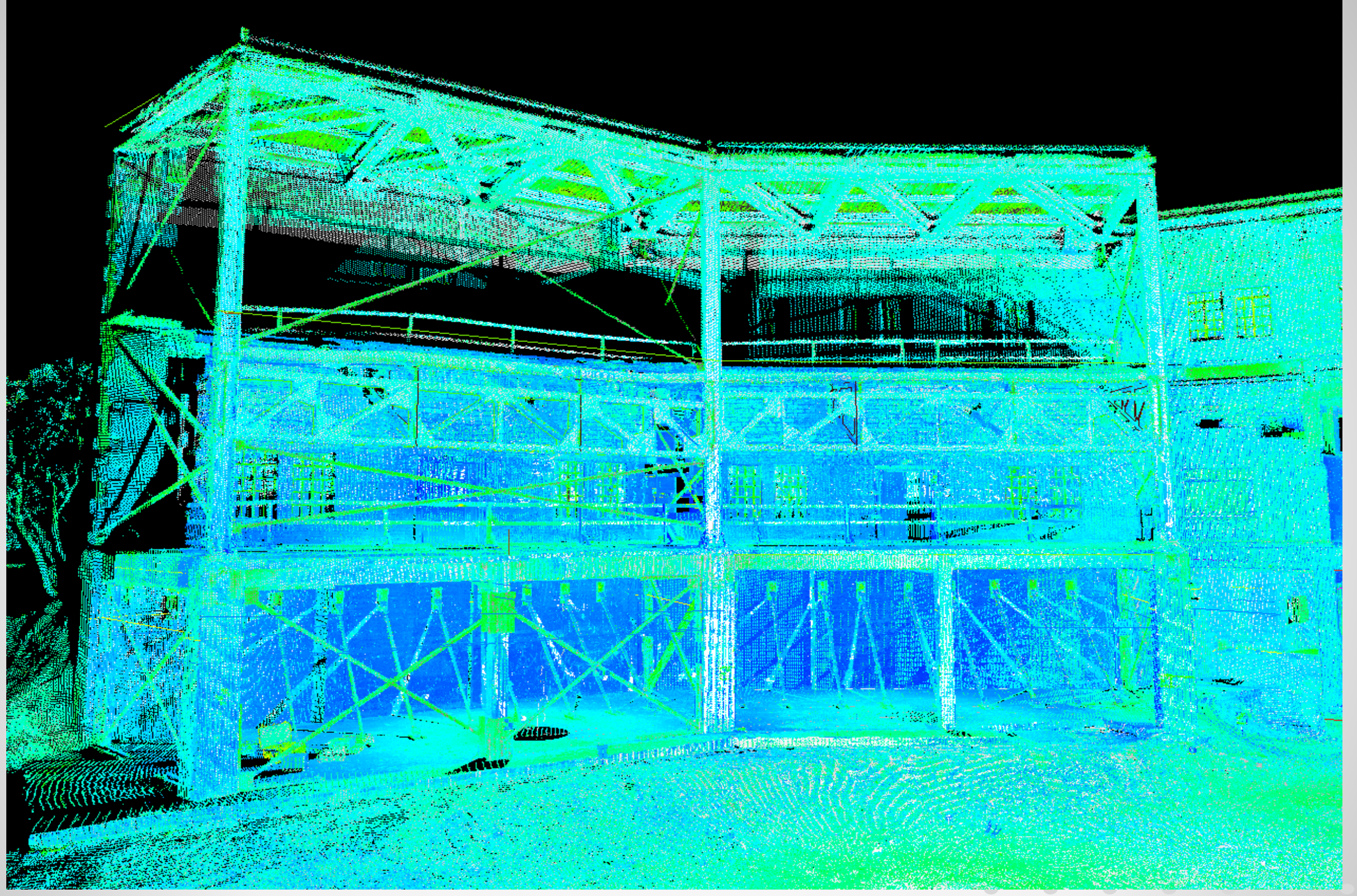
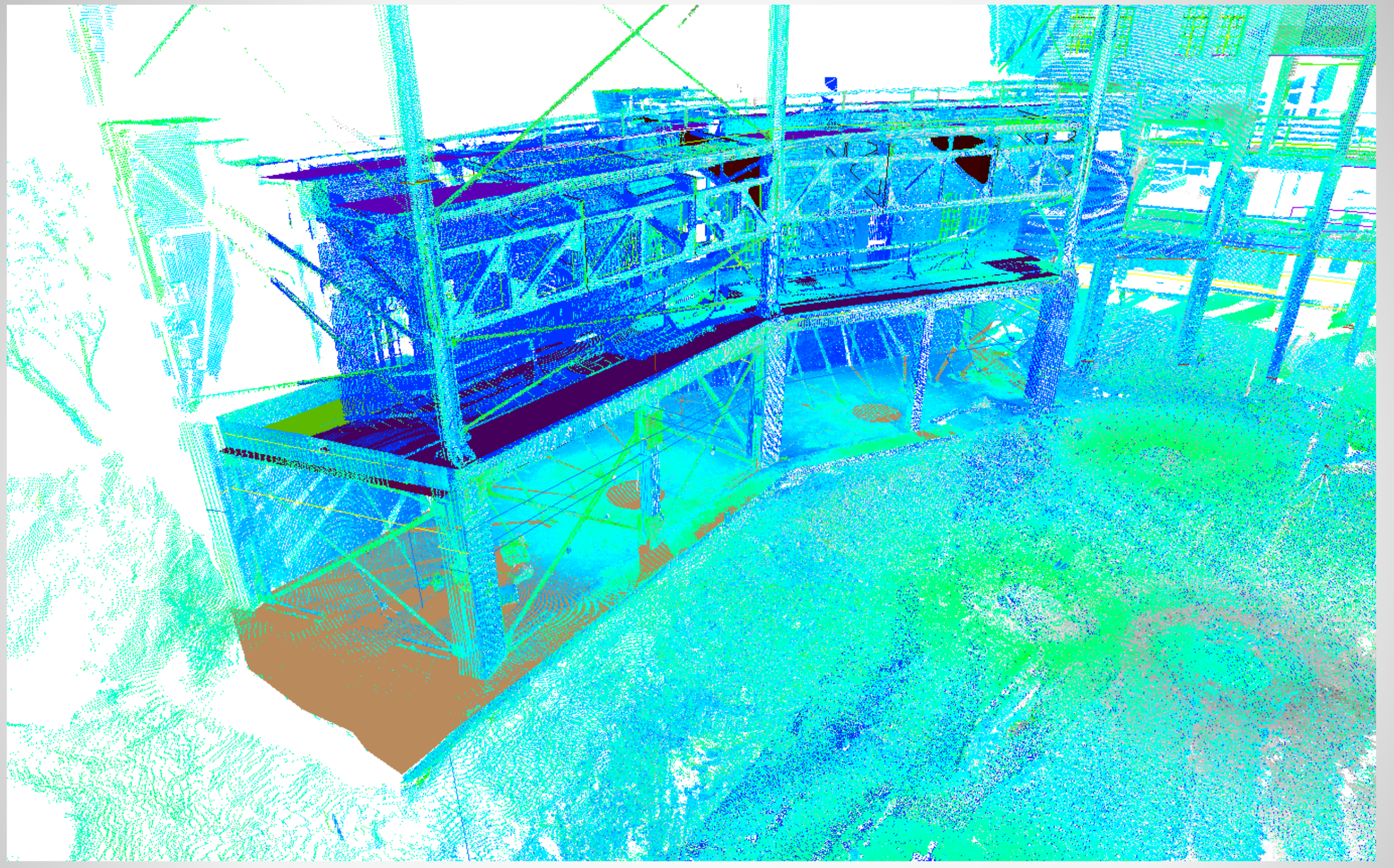
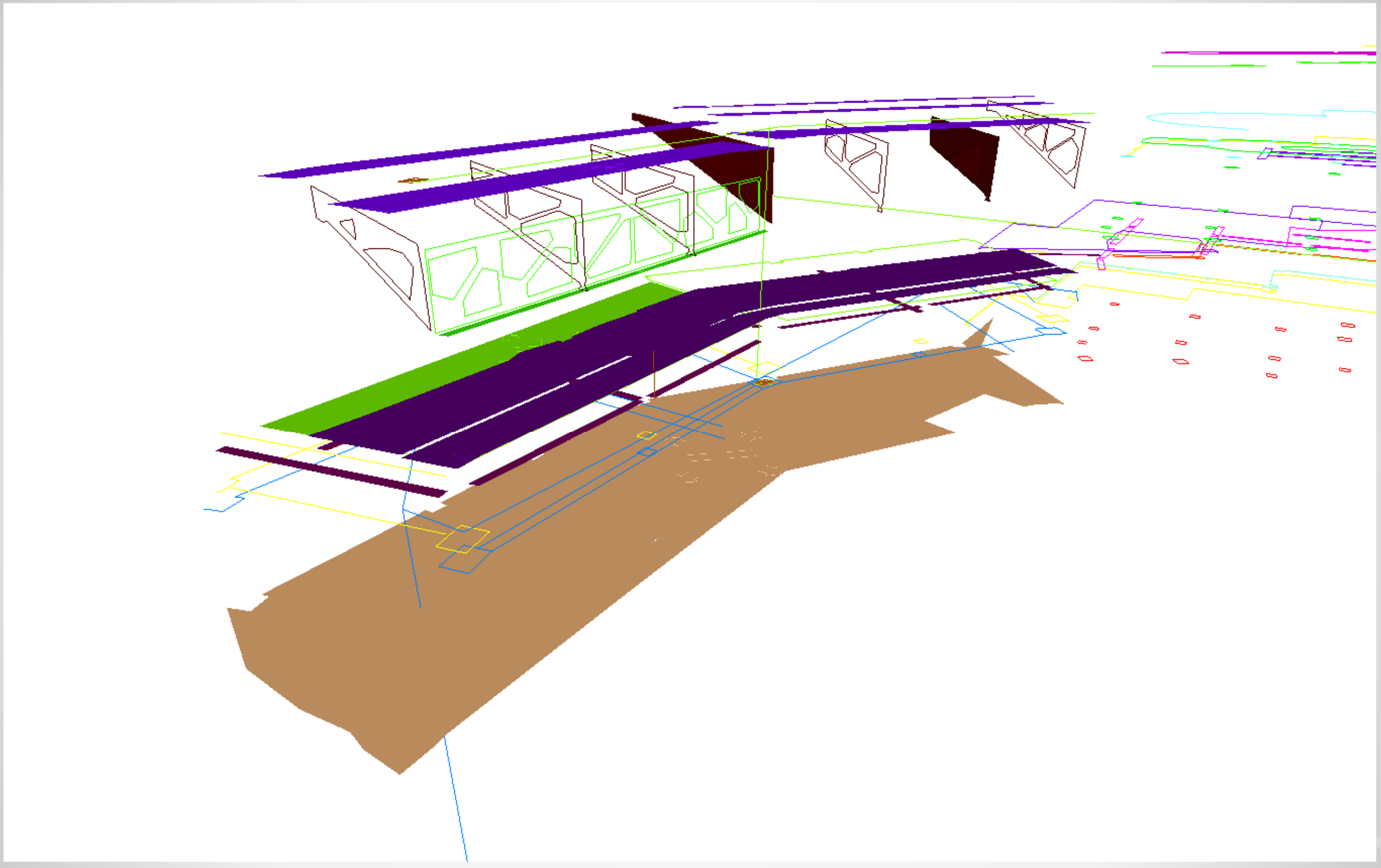
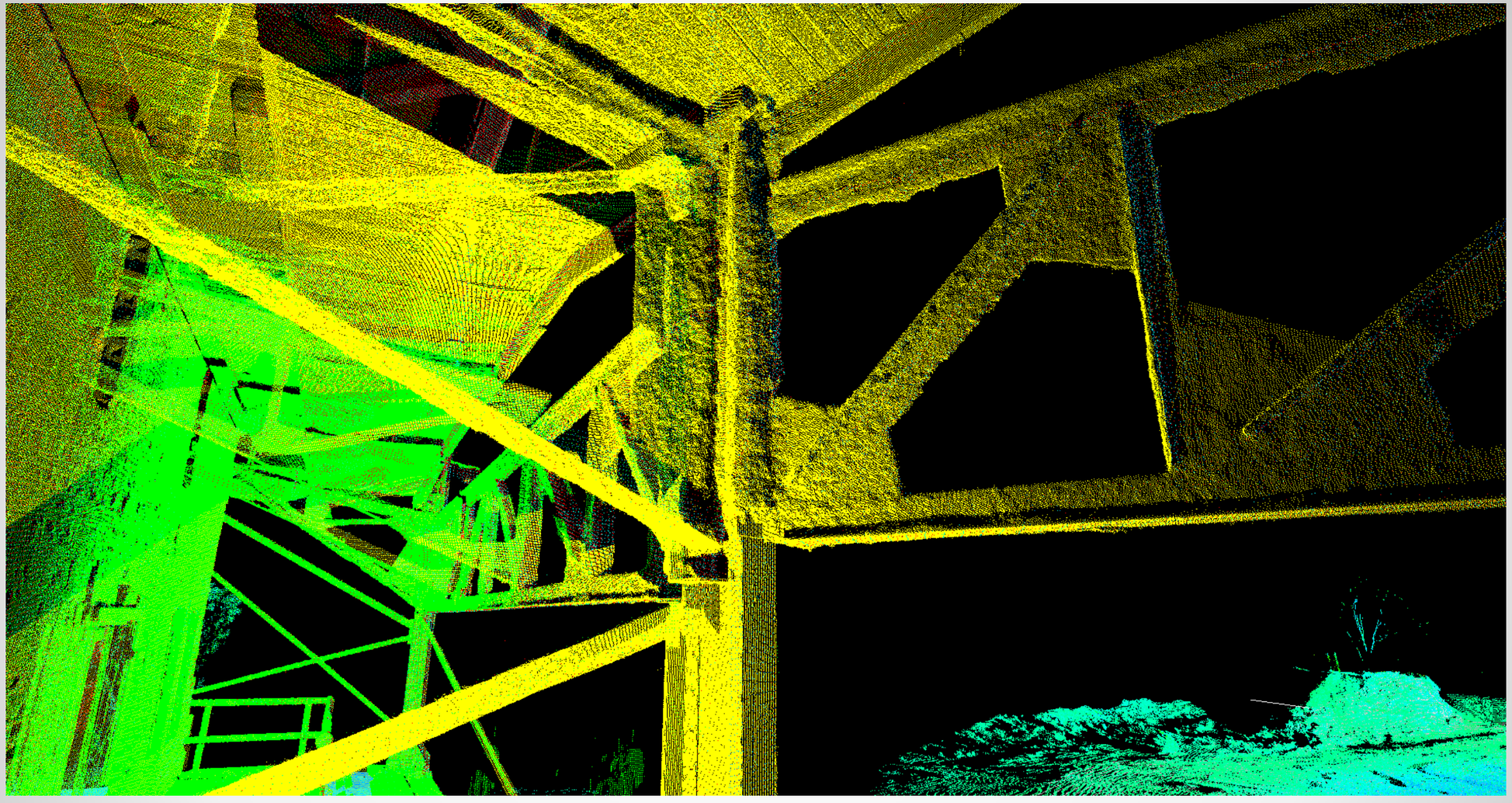
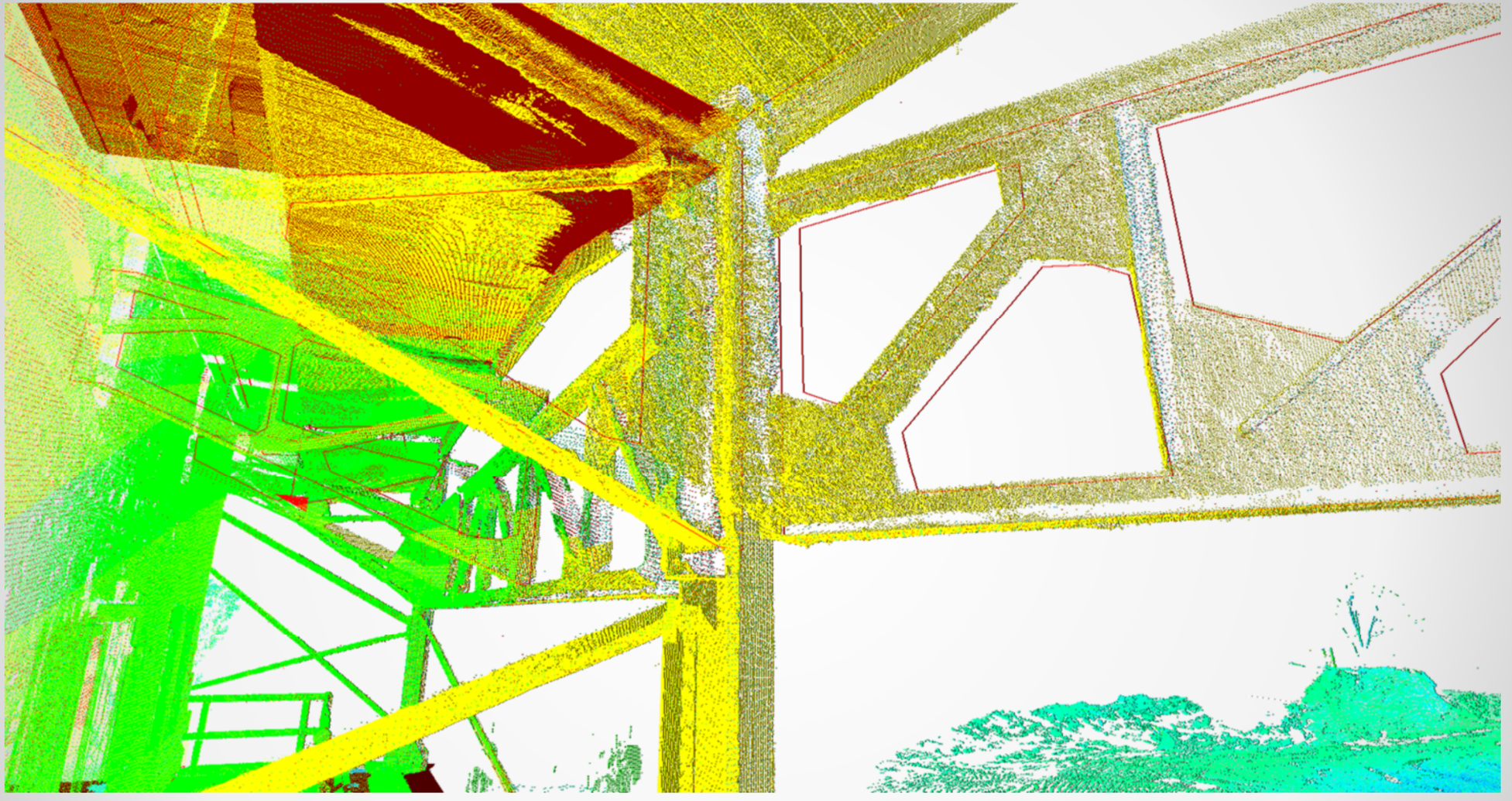


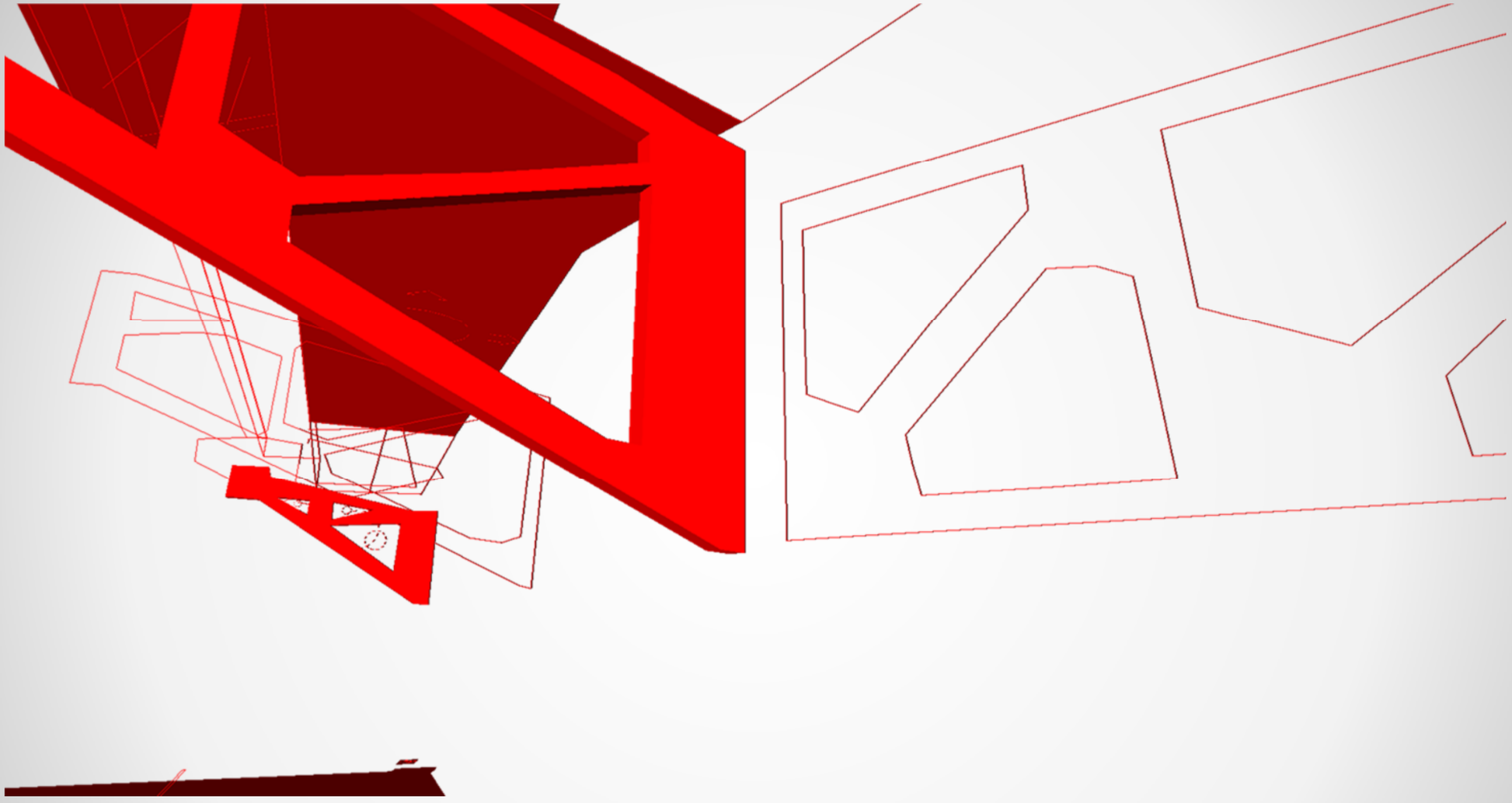


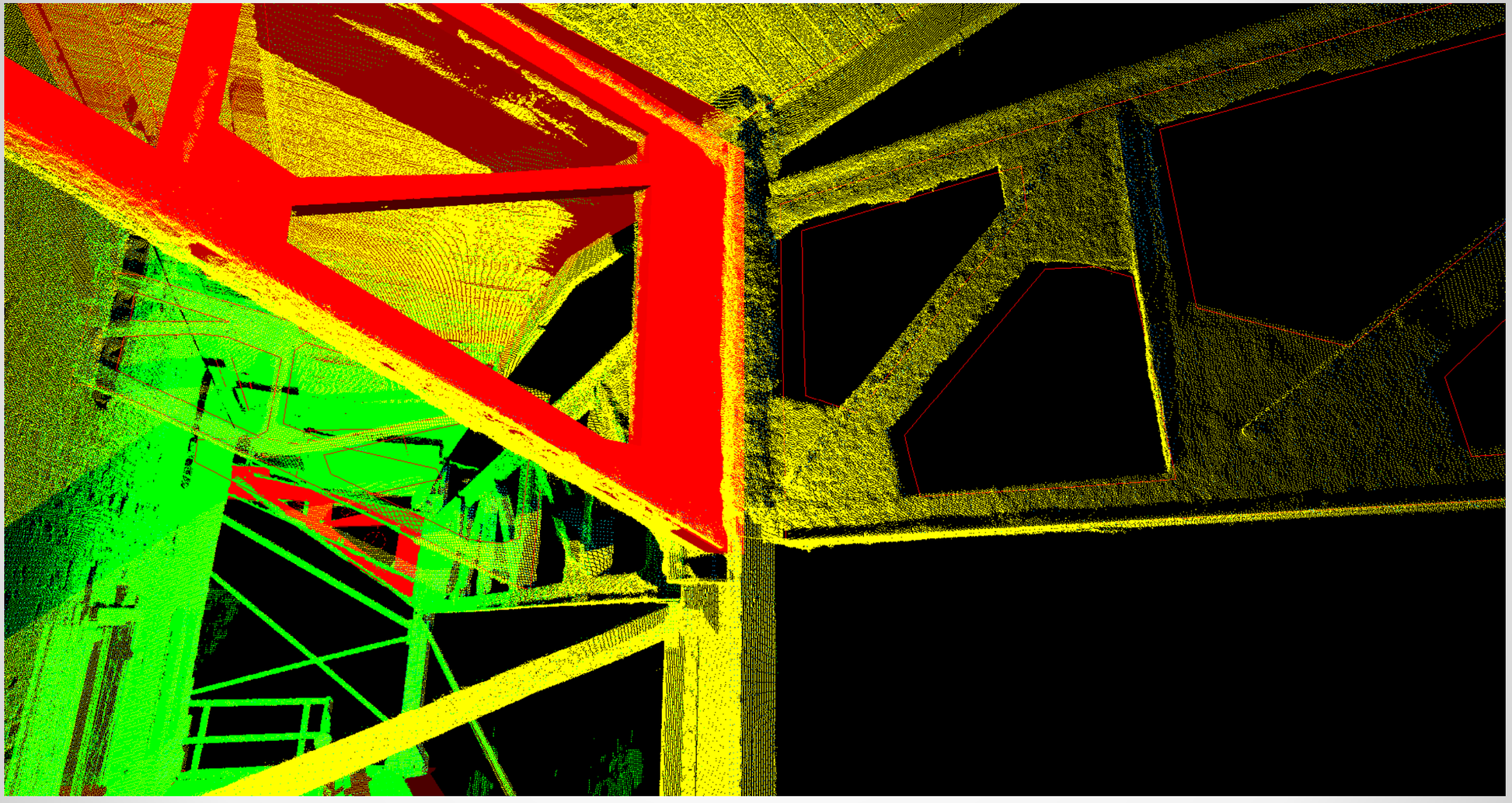




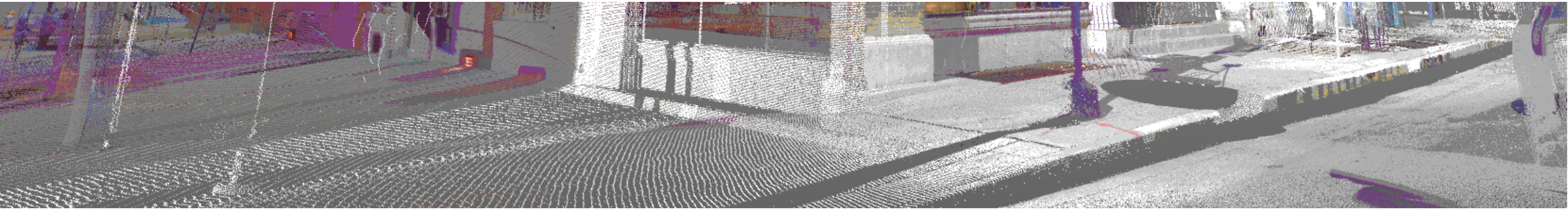








Historic Building Skins




AMERICAS
GREATEST FURNITURE
MANUFACTURERS

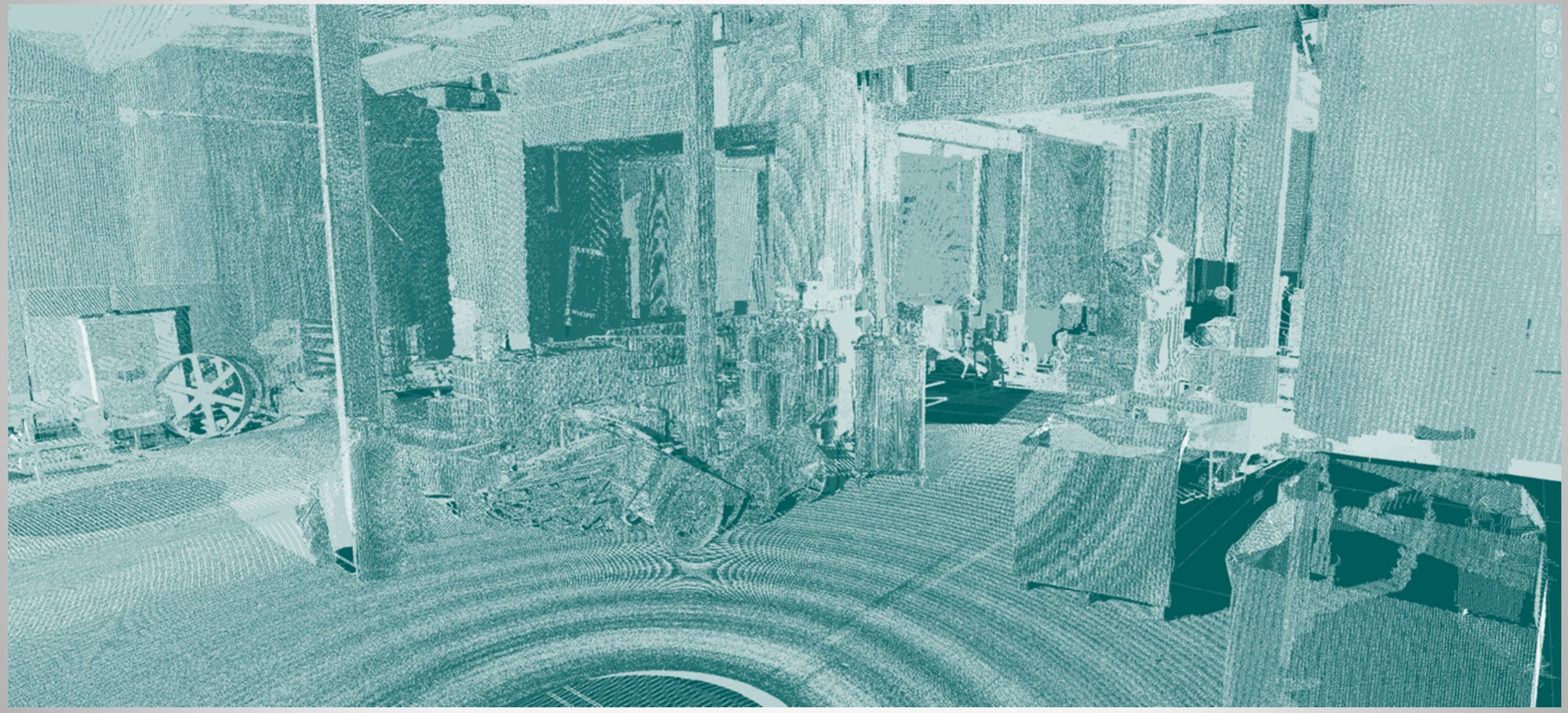
Historic Building Skins

- Time of day is very important for color scans.
- Consider site logistics & get permission to set up in others parking lots.

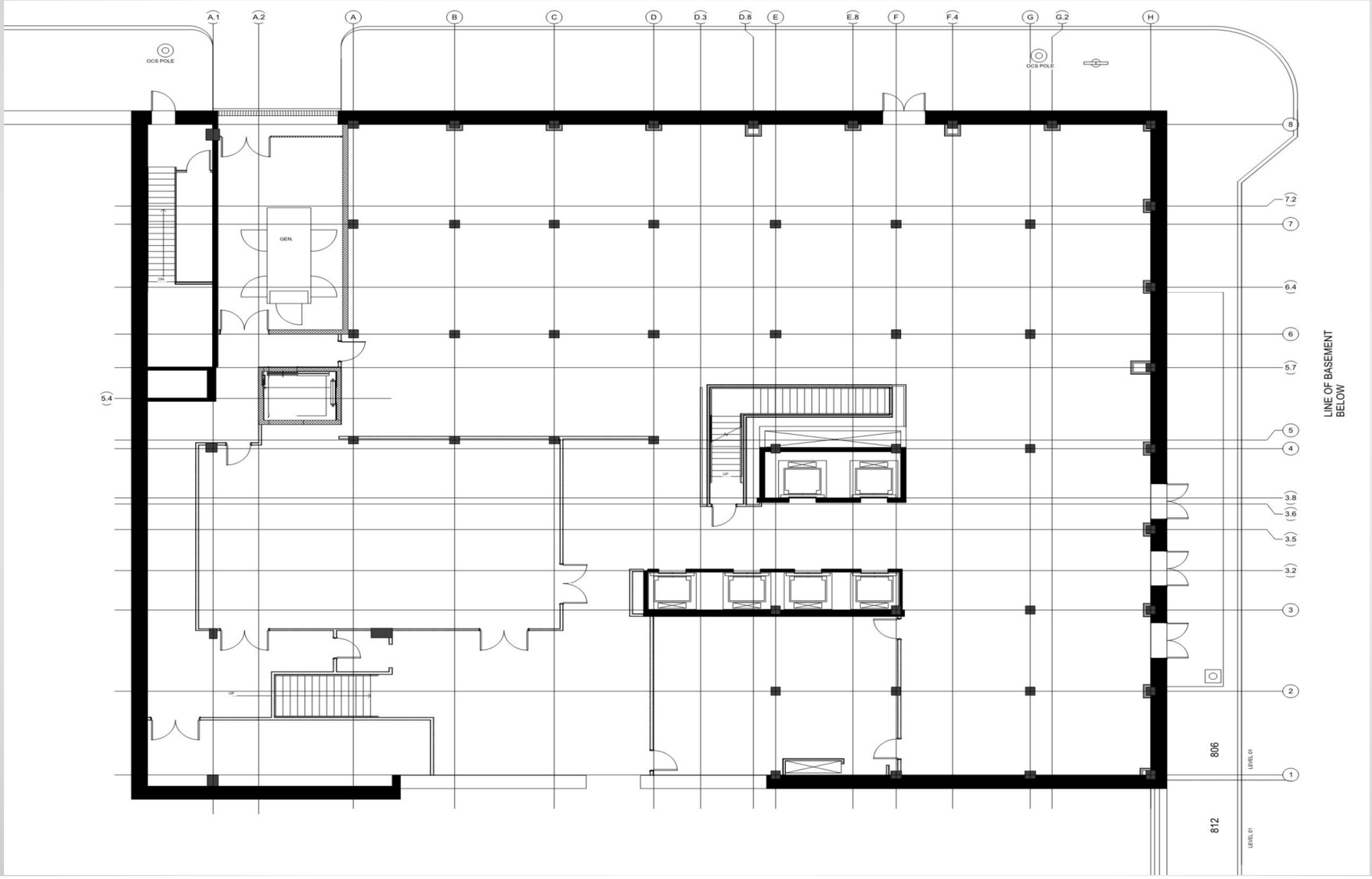
IKERD Consulting, LLC, 2013

Building Skins

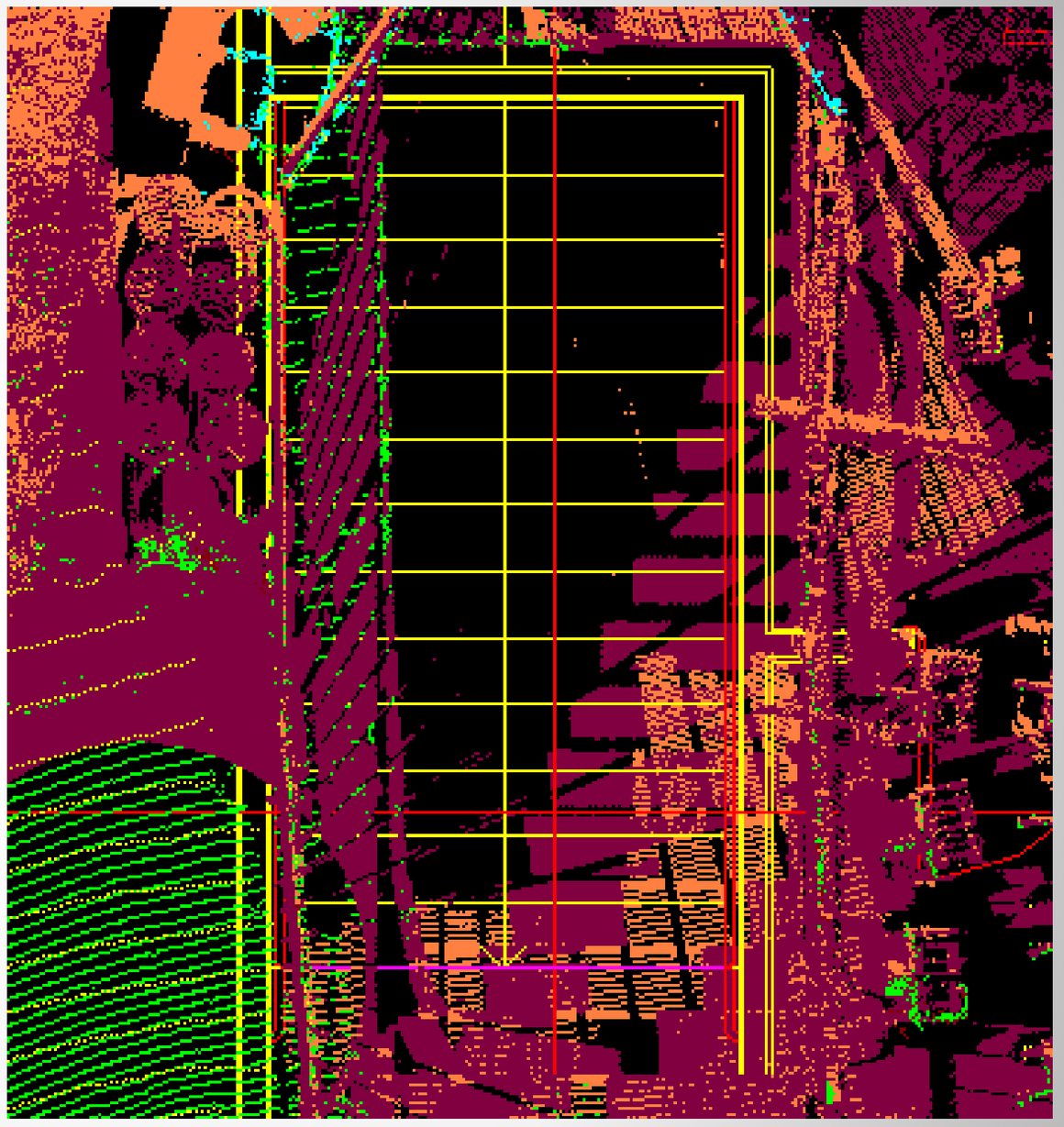
100+ Year-Old Concrete and Steel Structure

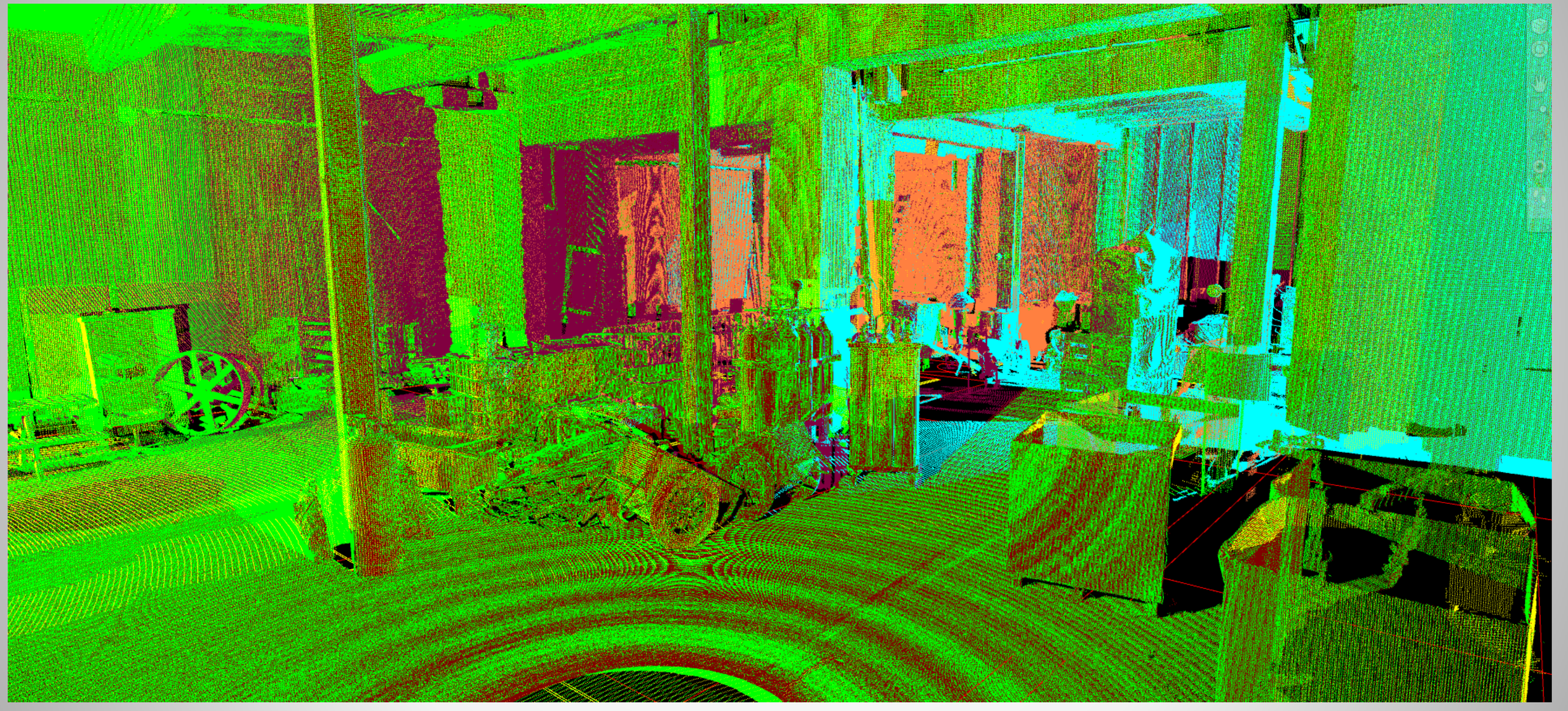


HOUSTON 100+ YR OLD BUILDING



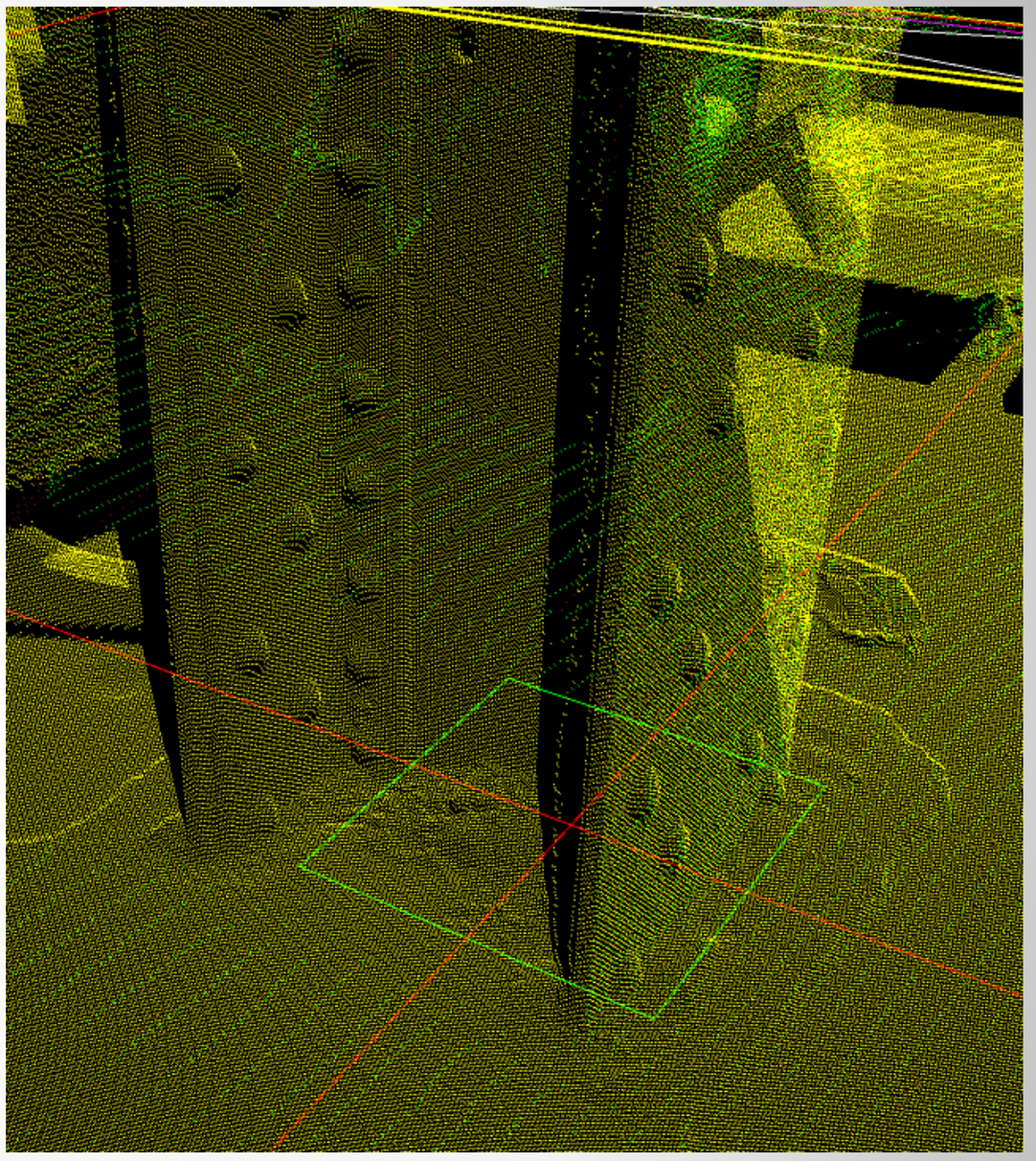
Look For Known Features Check Alignment



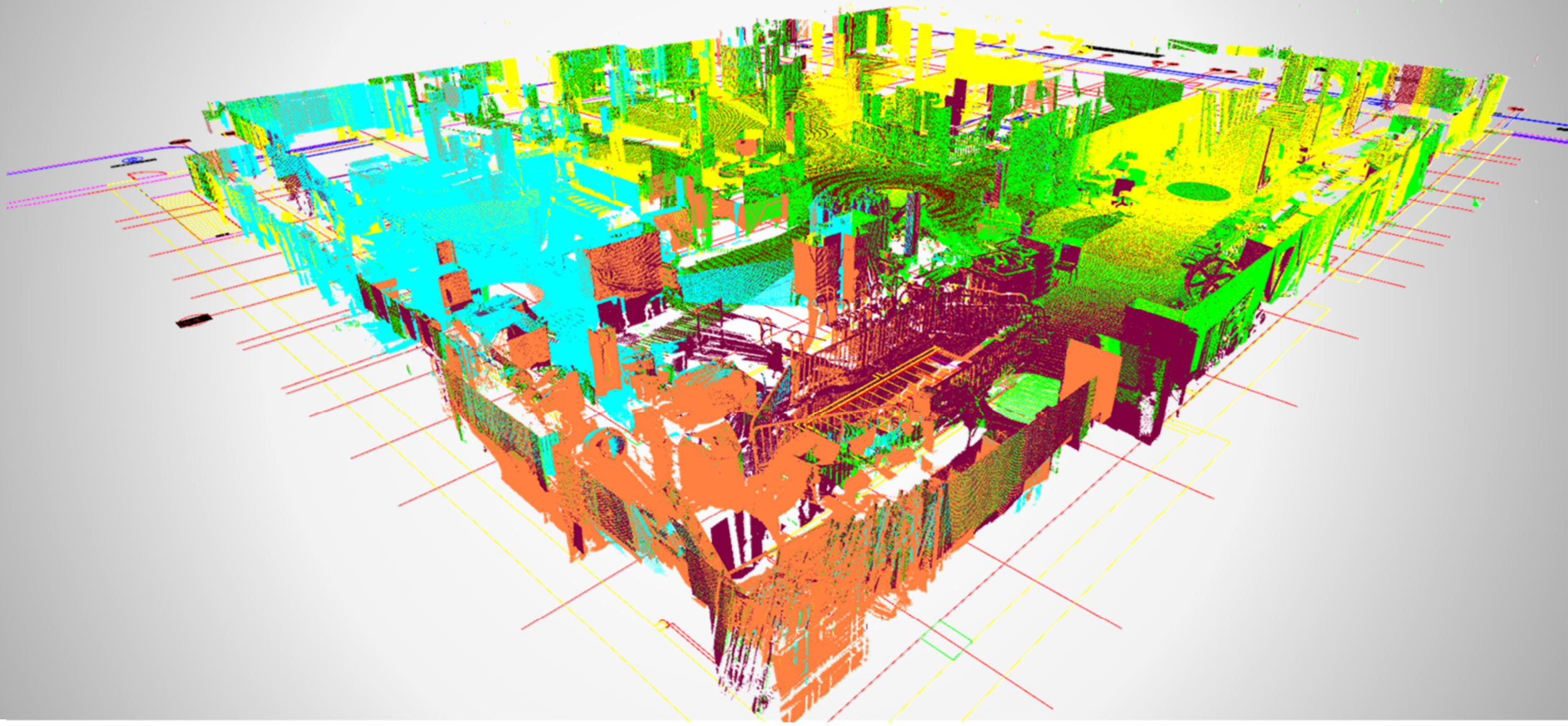


Historic Steel Structures

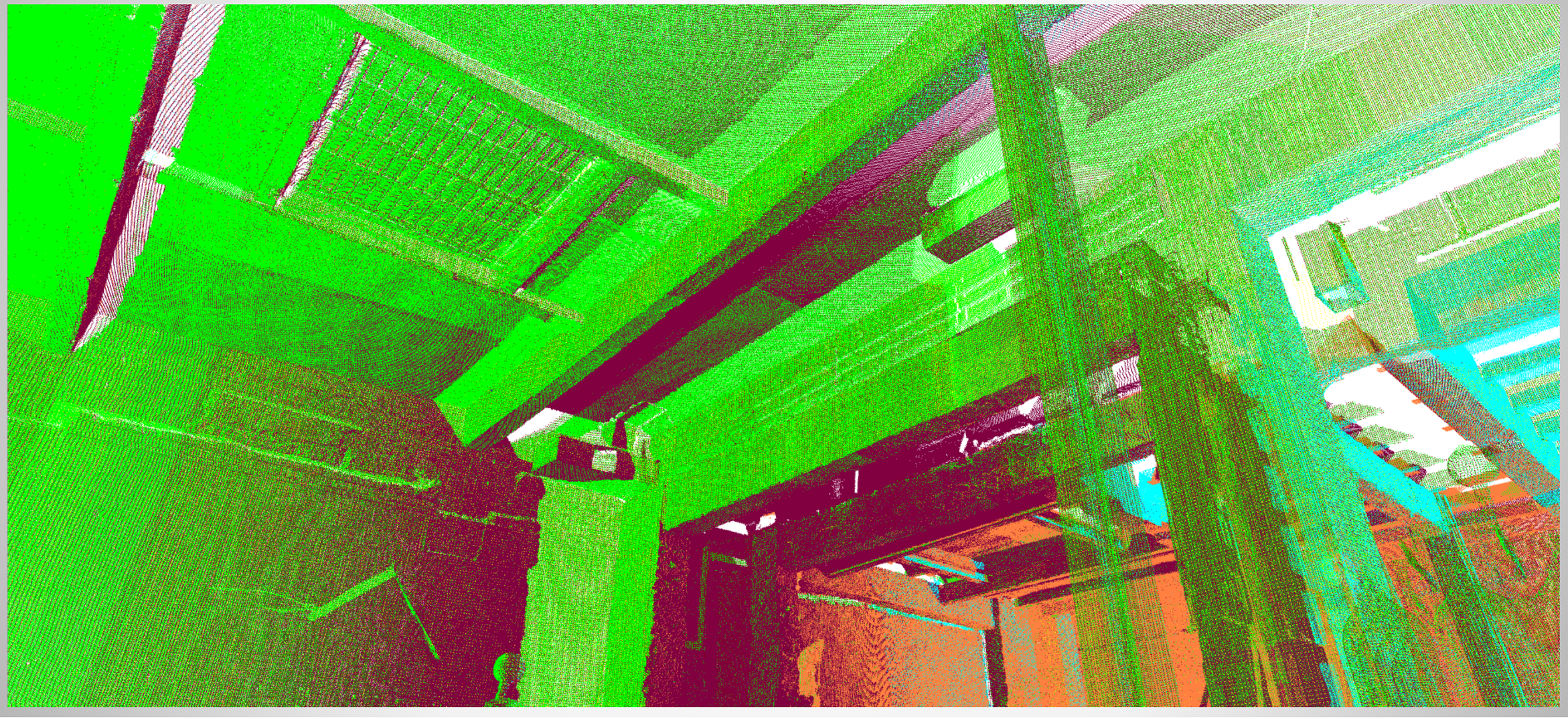
- Historic Steel Sections are not standard.
- Set scan density to pick up required detail.

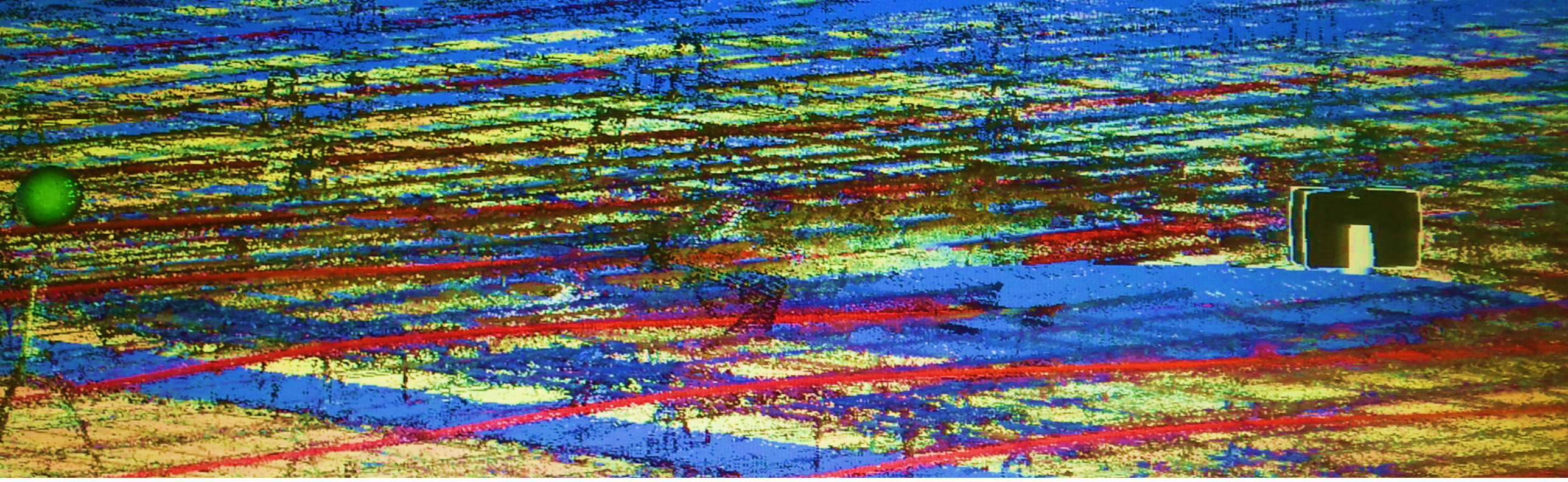


Color Scan For Teaching

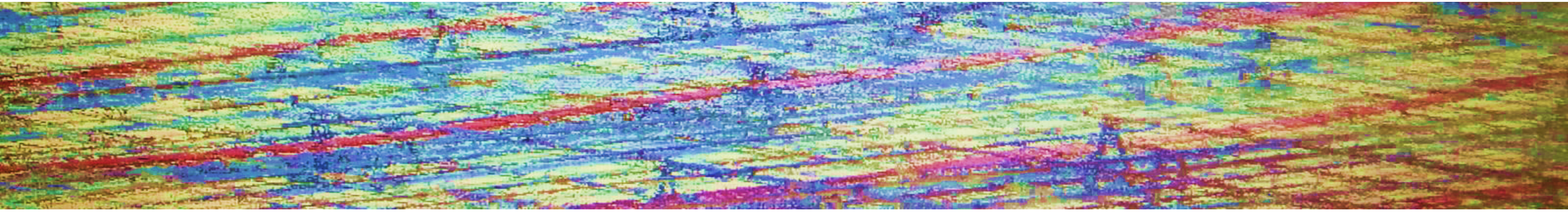


Concrete & Steel Sloping Structures

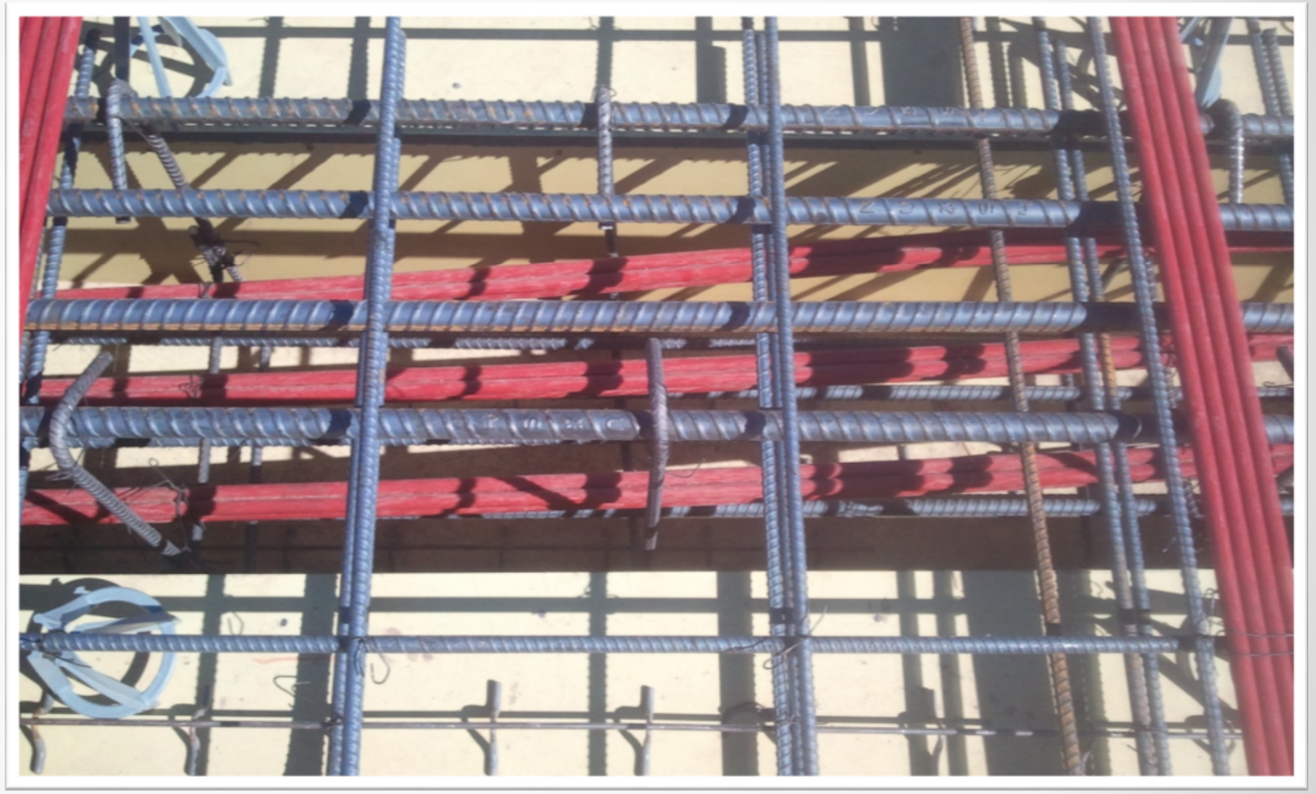




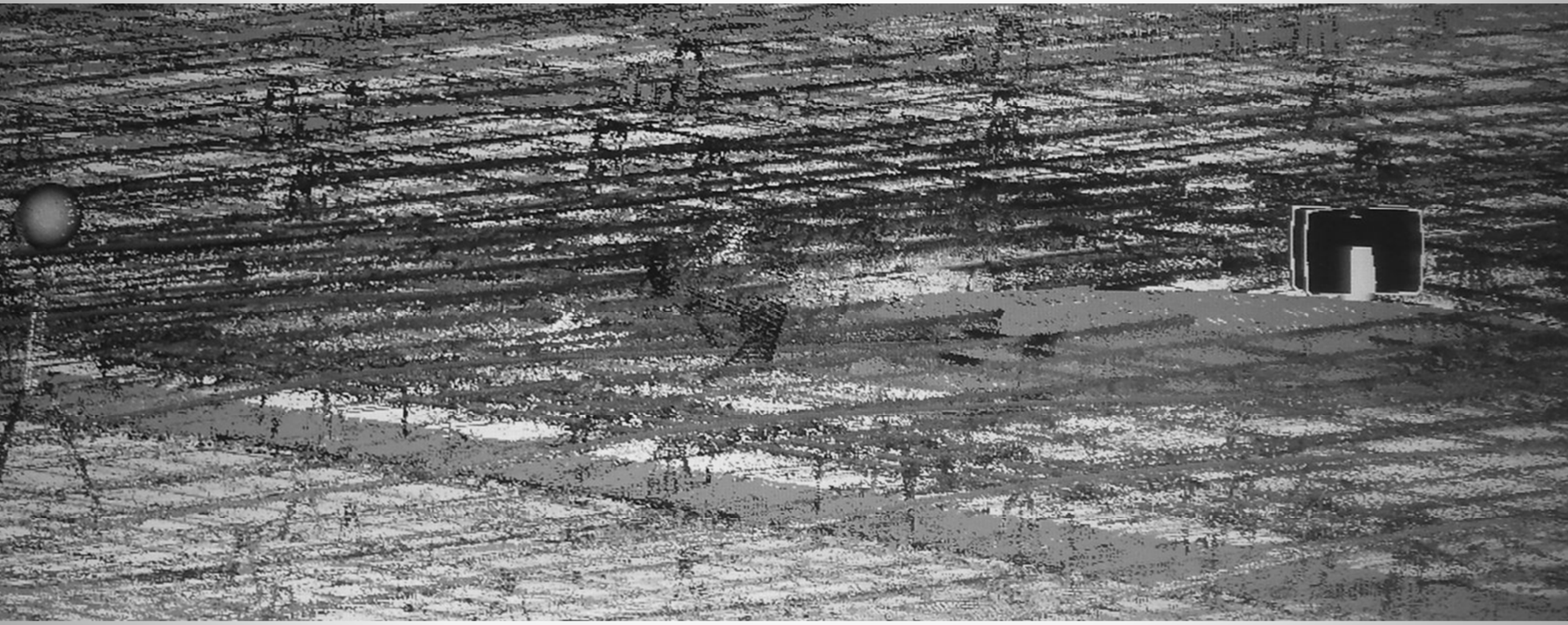
Post Tension Cable Scanning



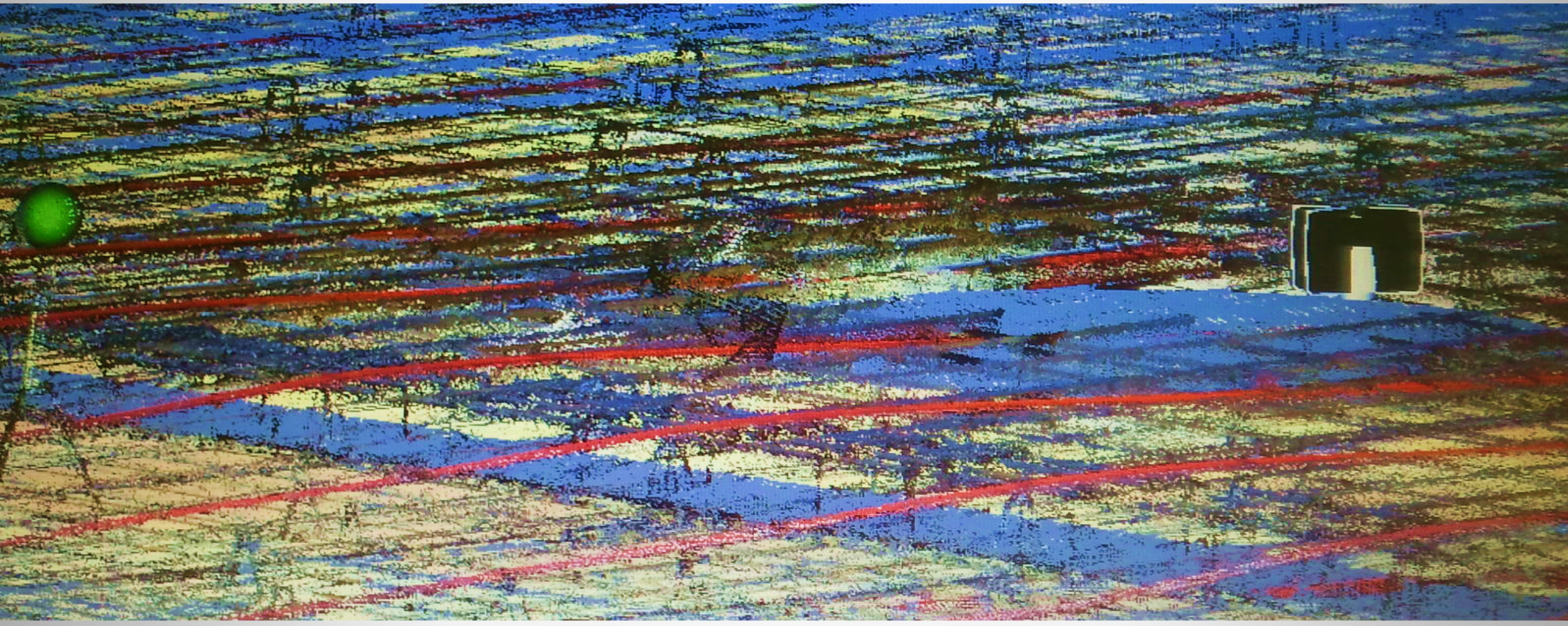
PT TENDONS



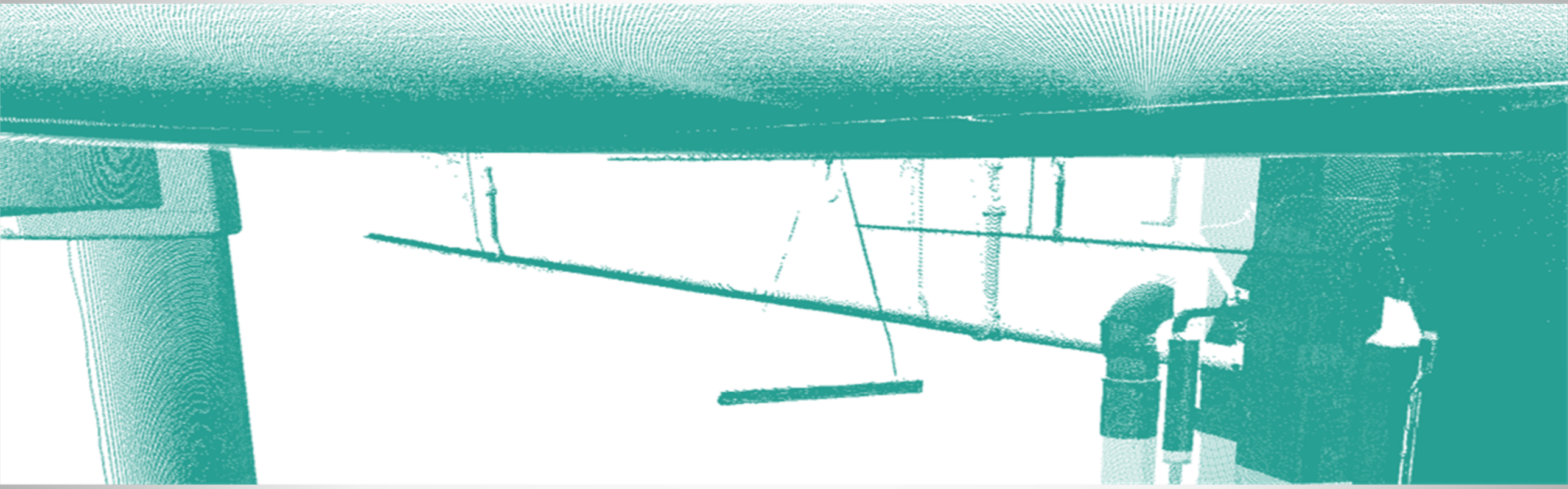
Monochrome



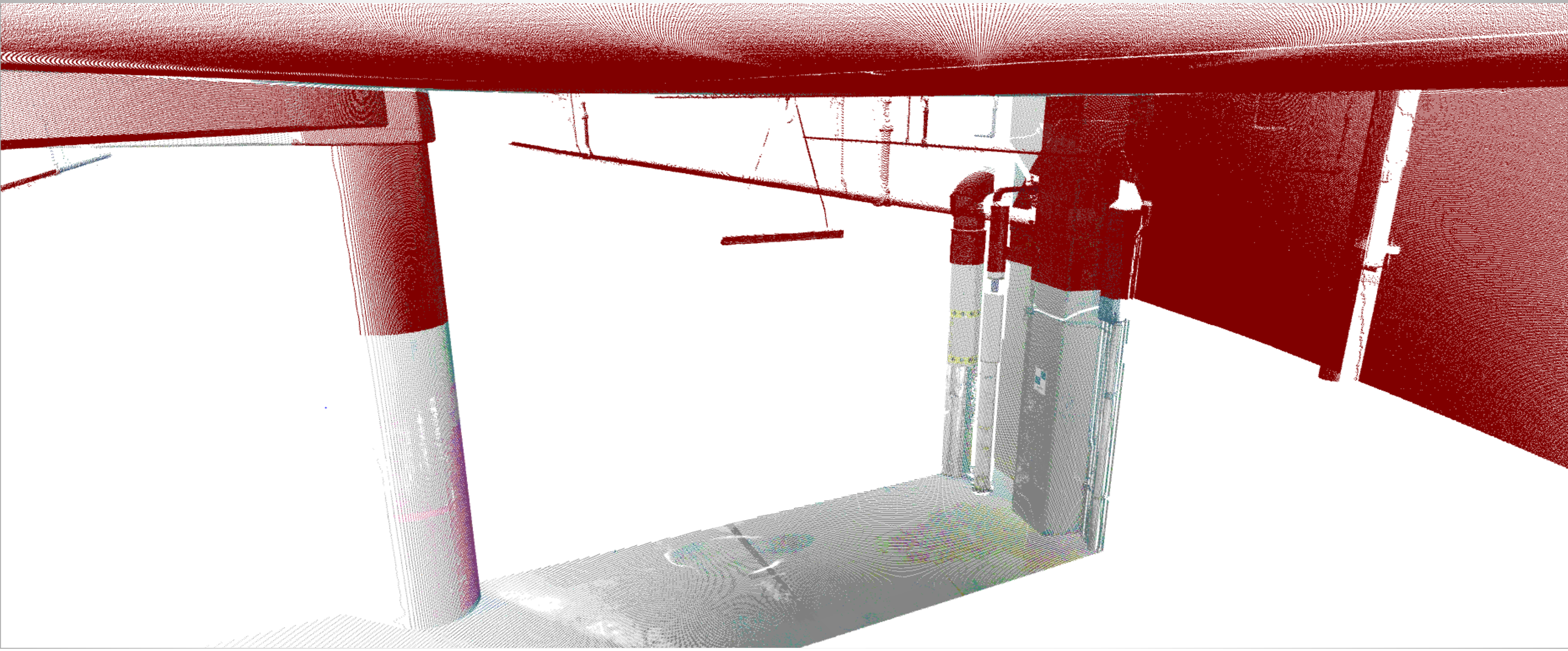
Color



Existing Concrete, New MEP



HD “Ceiling Cap”



Field Notes

Field Notes