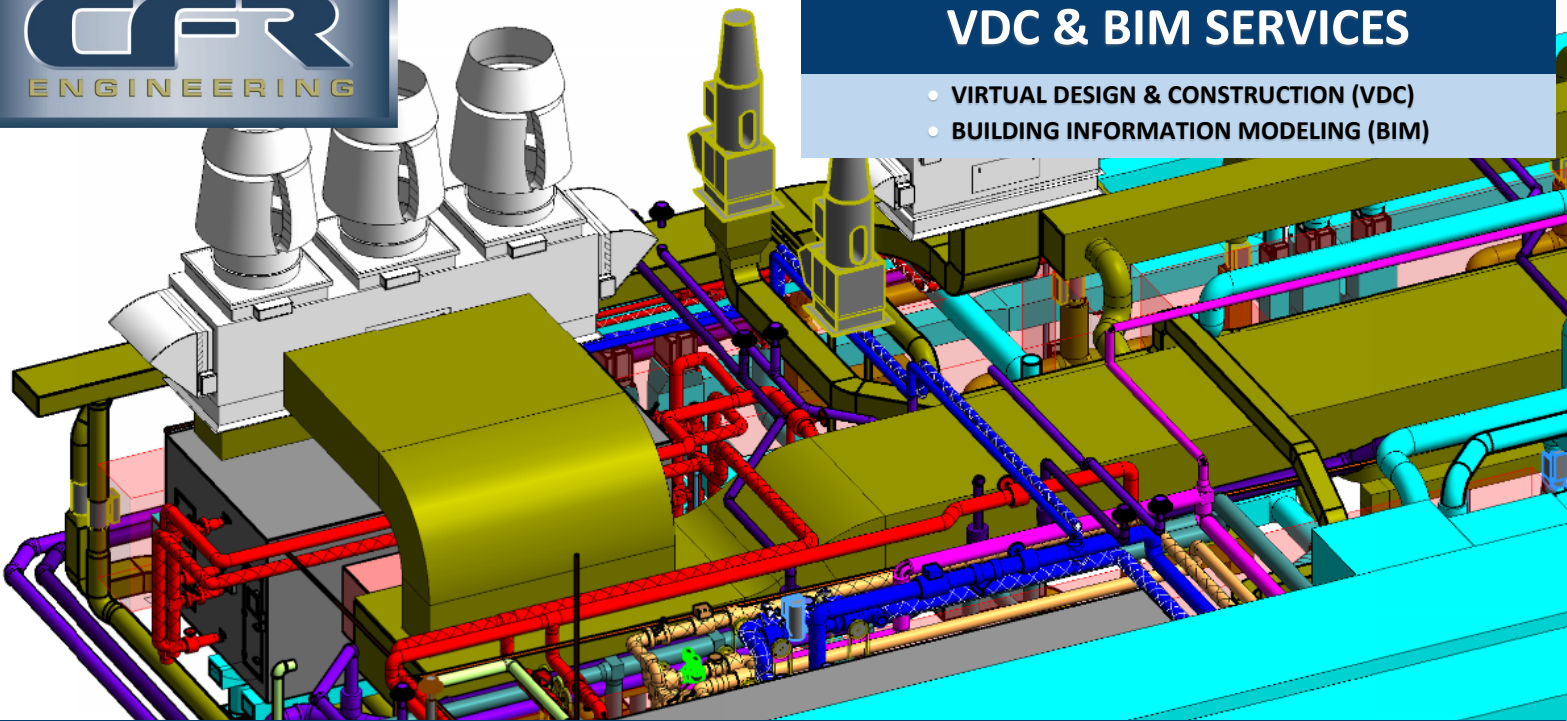


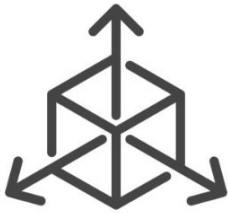
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- BUILDING INFORMATION MODELING (BIM)



**3D MODELING**

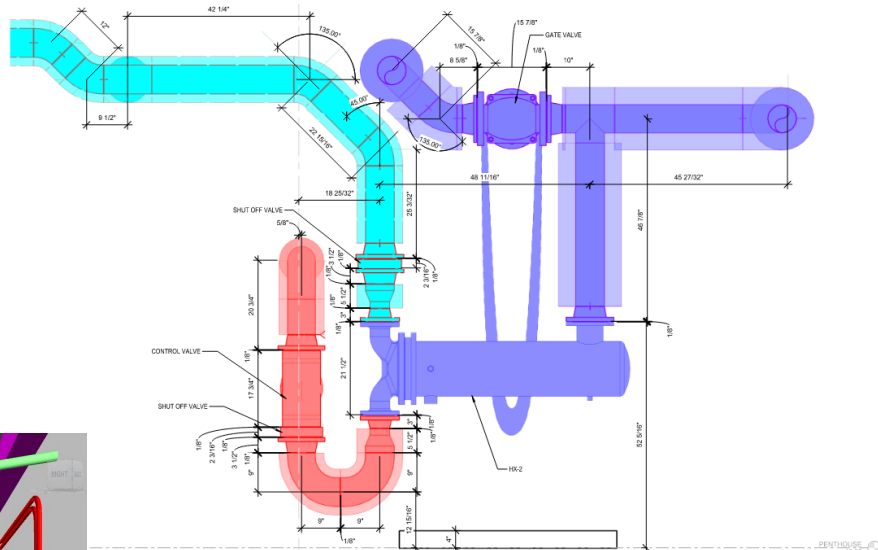
**COORDINATION**

**ADDITIONAL**



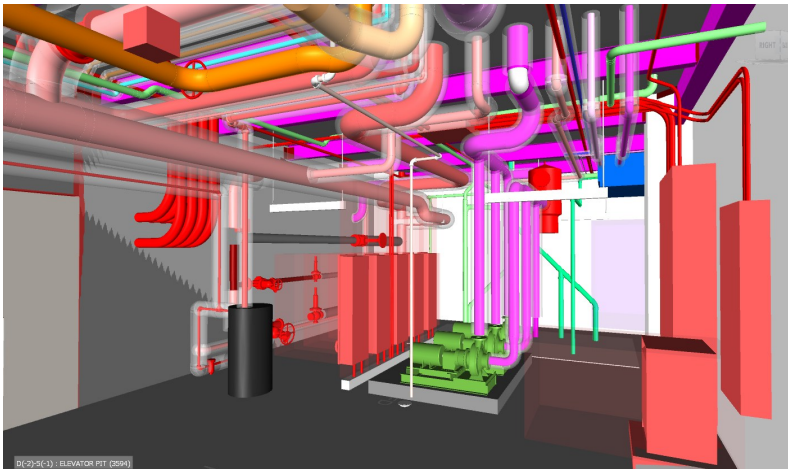
## 3D MODELING

- ◇ **DESIGN: LOD 200 - LOD 350**
- ◇ **CONSTRUCTION: LOD 300 - LOD 400**
- ◇ **AS-BUILT: LOD 300 - LOD 500**
- ◇ **DISCIPLINES / TRADES**
  - ◇ MECHANICAL PIPE & SHEET METAL
  - ◇ PLUMBING
  - ◇ POWER & LOW VOLTAGE
  - ◇ CIVIL
  - ◇ LIFE SAFETY
  - ◇ ARCHITECTURAL
  - ◇ STRUCTURAL



### ◇ SOFTWARE:

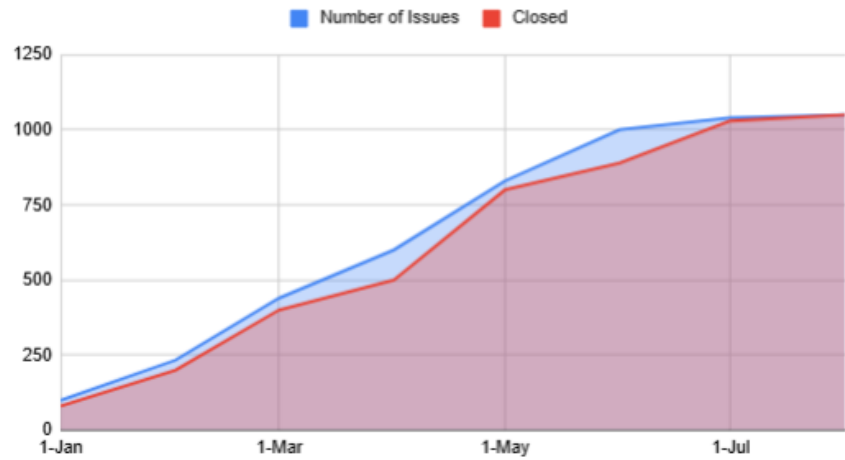
- ◇ REVIT
- ◇ NAVISWORKS
- ◇ AUTODESK CONSTRUCTION CLOUD
- ◇ BIM360
- ◇ TRIMBLE SYSQUE
- ◇ TRIMBLE CONNECT
- ◇ AUTODESK RECAP



# COORDINATION

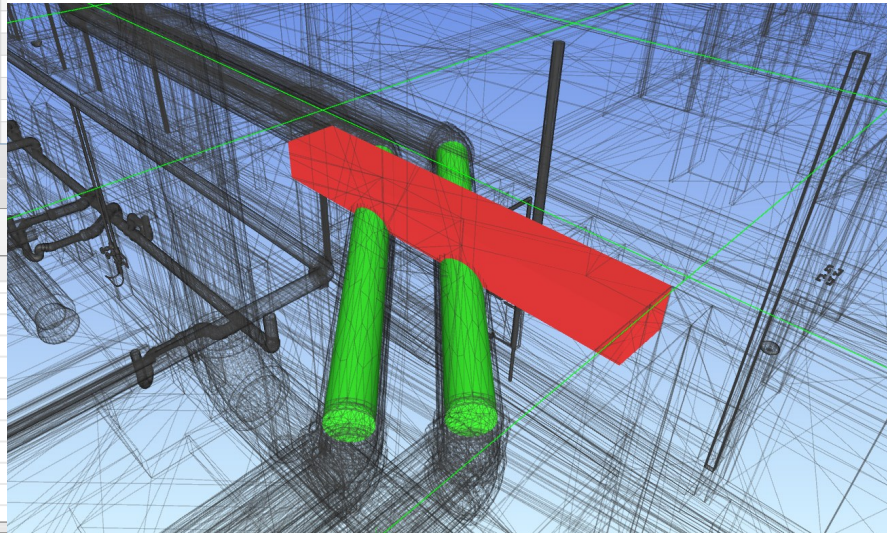
## CONSTRUCTION & DESIGN:

- ◇ COORDINATION LEAD
- ◇ BIM EXECUTION PLANNING
- ◇ BIM PULL PLANNING
- ◇ CLASH DETECTION
- ◇ CLASH DATA TRACKING
- ◇ NEWFORMA KONEKT (BIMTRACK)
- ◇ RFI CREATION



Name	Status	Clashes	New	Active	Reviewed	Approved	Resolved
Electrical vs SECO Telecom	Done	1	0	0	0	0	1
(M) Ductwork vs Struc	Done	204	6	43	0	0	155
(M) Pipe vs Struc	Done	109	16	0	0	1	92
(P) Pressure vs Struc	Done	90	22	0	0	6	62
(P) Sloped vs Struc	Done	247	38	0	5	118	86
(M) Ductwork vs Struc Column	Done	4	0	0	0	0	4
(M) Pipe vs Struc Column	Done	14	0	0	0	0	14
(P) Pressure vs Struc Column	Done	3	0	0	0	0	3
(P) Sloped vs Struc Column	Done	8	0	0	3	0	5

<div><div>Add Test</div><div>Reset All</div><div>Compact All</div><div>Delete All</div><div>Update All</div></div>																																																																		
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<table><tr><th>Name</th><th>Status</th><th>Level</th><th>Grid Int...</th><th>Found</th></tr><tr><td><div><div>Clash500</div><div></div></div></td><td>Approved</td><td>LEVEL 1...</td><td>J-3(1)-4(2)</td><td>22:52:09 25-08-2025</td></tr><tr><td><div><div>Clash506</div><div></div></div></td><td>Approved</td><td>LEVEL 1...</td><td>J-4(1)-2</td><td>22:52:09 25-08-2025</td></tr><tr><td><div><div>Clash510</div><div></div></div></td><td>Approved</td><td>LEVEL 1...</td><td>C(-3)-4(3)</td><td>22:52:09 25-08-2025</td></tr><tr><td><div><div>Sump Pumps clashing with footer</div><div></div></div></td><td>Reviewed</td><td>LEVEL 1...</td><td>L2-6.9</td><td>00:49:31 12-08-2025</td></tr><tr><td><div><div>Storm vs Concrete Column</div><div></div></div></td><td>Reviewed</td><td>LEVEL 1...</td><td>B-2</td><td>22:52:09 25-08-2025</td></tr><tr><td><div><div>Soil vs Concrete Column</div><div></div></div></td><td>Reviewed</td><td>LEVEL 1...</td><td>L2-6.8</td><td>22:52:09 25-08-2025</td></tr><tr><td><div><div>Fitting vs Footer (Did this change?)</div><div></div></div></td><td>Reviewed</td><td>LEVEL 1...</td><td>H(-1)-2(1)</td><td>22:52:09 25-08-2025</td></tr><tr><td><div><div>Plumbing Pipe vs Zone of influence</div><div></div></div></td><td>Reviewed</td><td>LEVEL 1...</td><td>L-2</td><td>22:52:09 25-08-2025</td></tr><tr><td><div><div>LEVEL 1_Basic Wall</div><div></div></div></td><td>New</td><td>LEVEL 1...</td><td>A-4(2)</td><td>10:54:35 27-08-2025</td></tr><tr><td><div><div>LEVEL 1_Basic Wall</div><div></div></div></td><td>New</td><td>LEVEL 1...</td><td>M-6.8</td><td>10:54:35 27-08-2025</td></tr><tr><td><div><div>LEVEL 1_Basic Wall</div><div></div></div></td><td>New</td><td>LEVEL 1...</td><td>J-4(1)-6</td><td>10:54:35 27-08-2025</td></tr><tr><td><div><div>LEVEL 1_Basic Wall</div><div></div></div></td><td>New</td><td>LEVEL 1...</td><td>K-6</td><td>10:54:35 27-08-2025</td></tr></table>		Name	Status	Level	Grid Int...	Found	<div><div>Clash500</div><div></div></div>	Approved	LEVEL 1...	J-3(1)-4(2)	22:52:09 25-08-2025	<div><div>Clash506</div><div></div></div>	Approved	LEVEL 1...	J-4(1)-2	22:52:09 25-08-2025	<div><div>Clash510</div><div></div></div>	Approved	LEVEL 1...	C(-3)-4(3)	22:52:09 25-08-2025	<div><div>Sump Pumps clashing with footer</div><div></div></div>	Reviewed	LEVEL 1...	L2-6.9	00:49:31 12-08-2025	<div><div>Storm vs Concrete Column</div><div></div></div>	Reviewed	LEVEL 1...	B-2	22:52:09 25-08-2025	<div><div>Soil vs Concrete Column</div><div></div></div>	Reviewed	LEVEL 1...	L2-6.8	22:52:09 25-08-2025	<div><div>Fitting vs Footer (Did this change?)</div><div></div></div>	Reviewed	LEVEL 1...	H(-1)-2(1)	22:52:09 25-08-2025	<div><div>Plumbing Pipe vs Zone of influence</div><div></div></div>	Reviewed	LEVEL 1...	L-2	22:52:09 25-08-2025	<div><div>LEVEL 1_Basic Wall</div><div></div></div>	New	LEVEL 1...	A-4(2)	10:54:35 27-08-2025	<div><div>LEVEL 1_Basic Wall</div><div></div></div>	New	LEVEL 1...	M-6.8	10:54:35 27-08-2025	<div><div>LEVEL 1_Basic Wall</div><div></div></div>	New	LEVEL 1...	J-4(1)-6	10:54:35 27-08-2025	<div><div>LEVEL 1_Basic Wall</div><div></div></div>	New	LEVEL 1...	K-6	10:54:35 27-08-2025
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## ADDITIONAL SERVICES

- » SHOP & SPOOL DRAWINGS
- » 3D SCAN INTEGRATION
- » 3D SCAN TO BIM
- » 4D&5D MODELING
- » RENDERINGS
- » MIXED & VIRTUAL REALITY
- » BIM MODEL REVIEWS
- » BIM STRATEGIC PLANNING
- » BIM IMPLEMENTATION PLANNING



## CERTIFICATIONS

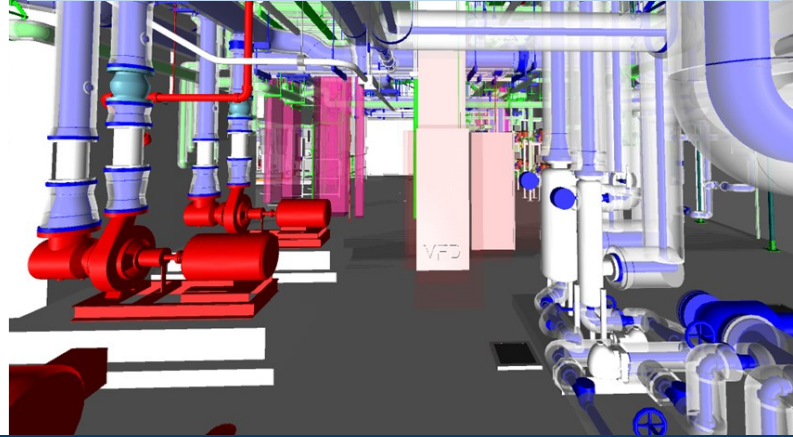
- » Certificate of Management - Building Information Modeling (CM-BIM AGC)
- » Autodesk Certified Professional - Revit Mechanical Design (ACP)





## VDC & BIM PROJECTS

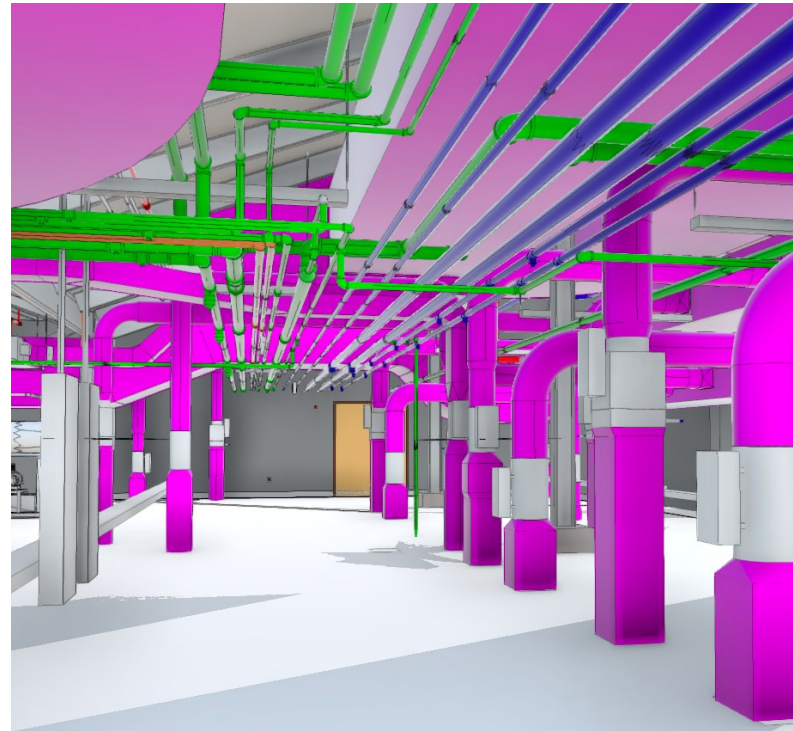
- VIRTUAL DESIGN & CONSTRUCTION (VDC)
- BUILDING INFORMATION MODELING (BIM)



## WHO WE ARE & WHAT WE DO

CFR Engineering, established in 2006, is a small business located in Germantown, MD, offering specialized Building Information Modeling (BIM) and Virtual Design and Construction (VDC) consulting services. Leveraging our foundation as a MEP engineering firm, we bring a unique perspective to BIM by combining design expertise with advanced modeling and coordination capabilities. We support projects of varying size and complexity for both federal and private markets, providing design and construction MEP modeling, as well as design and construction coordination. Our BIM services also extend to architectural and structural modeling, along with BIM Implementation and Strategic Planning (see full list of services on CFR BIM & VDC Services One Pager). CFR has completed BIM projects for the following clients:

- » Bell Mechanical
- » Cutlass Contracting
- » Hensel Phelps
- » Howard Hughes Medical Institute (HHMI)
- » National Institute of Health (NIH)
- » National Institute of Science (NIST)
- » Naval Facilities Engineering Systems Command (NAVFAC)
- » Department of Veterans Affairs (VA)
- » Liberty Electric Company



## CONSTRUCTION MODELING & COORDINATION

### NIH BUILDING 40A - NEW CONSTRUCTION

BETHESDA, MD

CFR provided BIM Coordination and modeling services across multiple disciplines including structural, plumbing, mechanical piping, ductwork, lab plumbing and electrical. The scope of work for this project included delivering coordinated & constructible LOD350 BIM models. Prior to CFR's involvement, construction was put on pause due to coordination issues deeming areas of the building not constructable. CFR's BIM team began by remodeling and coordinating the most congested areas of the project. We started with the Basement Mechanical Room, moving onto the Penthouse, 2nd Floor Interstitial, 3rd Floor Interstitial and finishing with the 5th Floor Plenum and 5th Floor Interstitial. Throughout this process our team performed drawing reviews, clash detection and clash resolution, provided RFIs for submission to the EOR, and delivered penetration drawings, shop drawings, and BIM models to the client. CFR provided a unique advantage by including our in-house mechanical and electrical engineers to oversee the coordination process ensuring the original design intent was not altered with sign-off from the EOR. This collaborative approach allowed construction to successfully resume and continue with confidence.

***Photo Top Right depicts basement mechanical room modeled and coordinated. Photo top left depicts the same space successfully under construction relying on shop drawings produced by CFR's BIM modelers and engineers.***



# CONSTRUCTION MODELING & COORDINATION CONTINUED

## NIH BUILDING 31A - NEW CONSTRUCTION

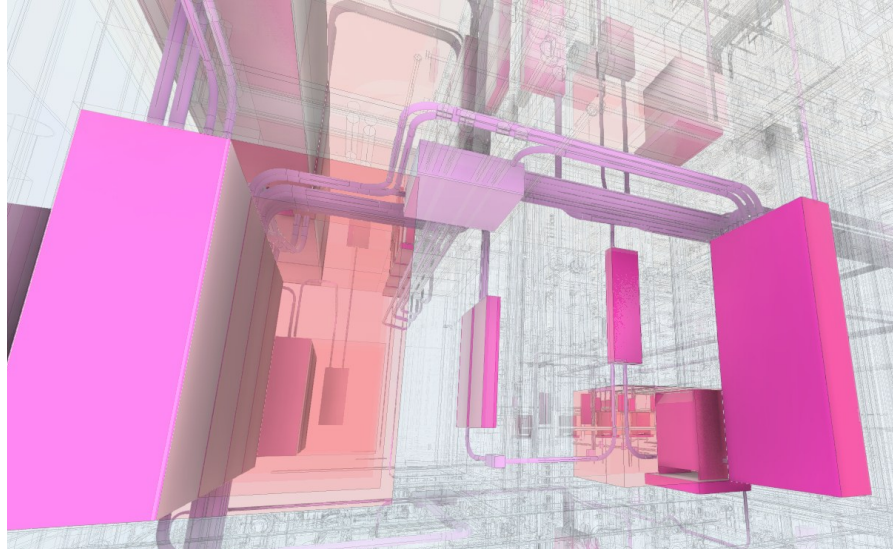
HAMILTON, MT

CFR provided LOD 350 BIM modeling and coordination services for electrical power and low voltage systems. CFR's BIM modelers worked directly with the electrical foreman to ensure conduits, cable tray, fixtures and equipment were modeled accurately to decrease clashes in field and minimize change orders and RFIs. CFR provided coordination services by working along side the general, mechanical, and fire protection contractors to resolve clashes and deliver a constructable model. Construction is in progress and is scheduled for completion in 2026.

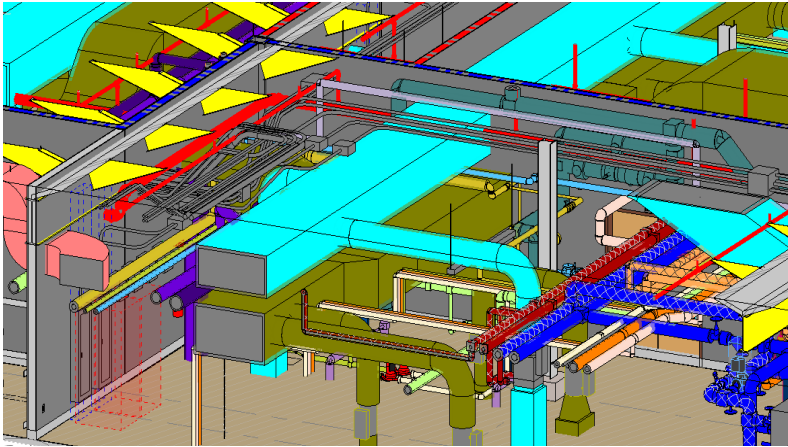
## NIH BUILDING 41 - REHEAT SYSTEM REPLACEMENT

BETHESDA, MD

CFR provided LOD 350 BIM modeling and coordination services for MEP systems. This project involved new steam stations, heat exchangers, VAVs, heating hot water piping and pumps. CFR was brought on to model these systems within the existing space providing multiple options on equipment, pipe and conduit layout while keeping egress paths and code compliance in mind. In order to coordinate with the existing space CFR embedded a 3D point cloud scan within their models to see how the new systems would interact with the existing conditions. CFR held weekly meetings with construction stakeholders including NIH, the general contractor and sub-contractors to review conflicts in the model and discuss the overall layout of valves and equipment for ease of maintenance. Now that coordination services are no longer needed CFR is providing LOD 500 As-Built modeling of the installed systems.



## DESIGN MODELING AND COORDINATION



## NIH BUILDING 102A & B WINGS - NEW CONSTRUCTION

POOLESVILLE, MD

CFR is contracted to provide MEP engineering and BIM modeling services for this project under the mechanical and electrical subcontractors. The project requires all design disciplines to model and coordinate a LOD 300 model. We have partnered with Bell Mechanical to take this a step further by incorporating fabrication parts in our design model to ensure the mechanical piping systems fit in the design space. We are also responsible for delivering a clash free model for the foundation to grade 100% submission and base building 100% submission. CFR utilized clash detection and resolution along with working closely with the other design disciplines to reach zero clashes for both 100% design submissions.

## AS-BUILT & DIGITAL TWIN MODELING

## HHMI APT C & LANDSCAPE BUILDING - NEW CONSTRUCTION

ASHBURN, VA

CFR provided design and BIM modeling services for a new building on HHMI's Janelia campus, Apartment C. The project required a LOD300 model for the design submission and a LOD350 for the post construction as-built models. Our team provided complete BIM models with the final submission of the design project. After construction was finalized CFR completed multiple surveys to accurately reflect the locations of MEP equipment and piping in the BIM models. CFR also surveyed fire protection standpipe systems to reflect them accurately in the BIM models. The project also included BIM modeling of the complete electrical systems of the Landscape Building at HHMI Janelia. We coordinated directly with HHMI to include proprietary HHMI parameters in all electrical families. This ultimately allowed a link between the electrical model and the facility management system.

