PROPOSAL

Sara Pace
Mike Lucas
Paul Kuehnel
Jon Brangan

Building STIMULUS
THE GREEN BUILDING SPECIALISTS

Areas of Design Focus

Facade

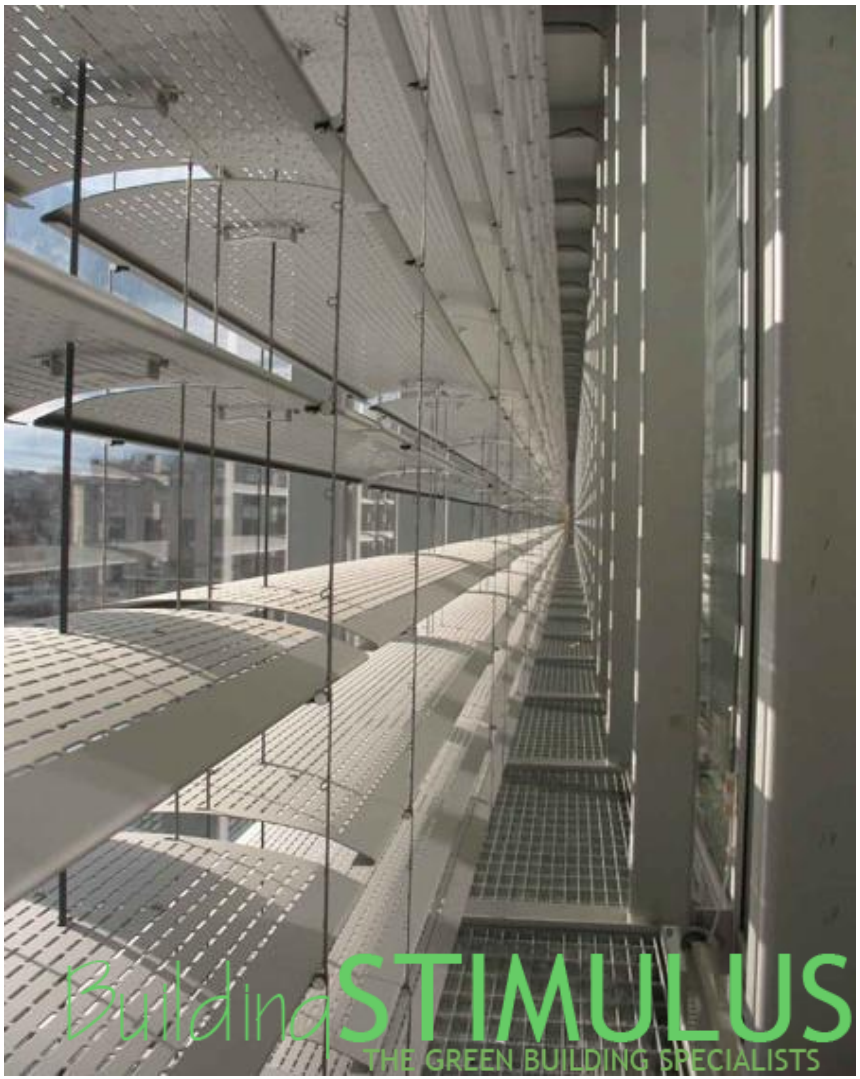
- Why?
  - Reduce glare
    - Current solar louvers are standardized
  - Improve thermal performance
    - Façade heat gain contributes to 46% of office cooling loads
  - Reduce load on structure from precast panels

Facade

- How
  - Double Skin Façade
    - Air Gap
      - Integrated Shading Devices
      - Thermal Buffer
    - Panel
      - Exterior Finishing System (EIFS)
      - One-Way Pan Joist System
      - Carbon Fiber Reinforced Pre-Cast Panels

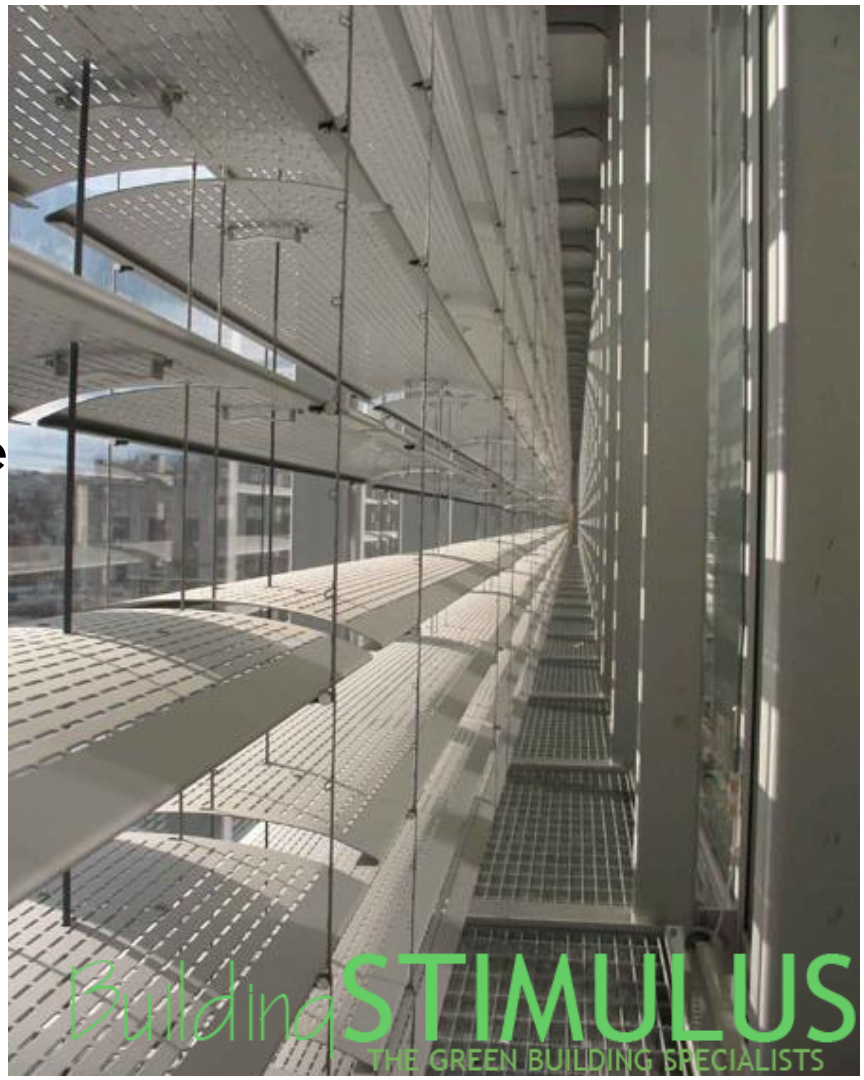
Double Skin Façade

- **Solar Shading…why?**
  - Help Reduce Heat Gain
  - Increase Productivity
  - Reduce Electric Lighting



Double Skin Façade

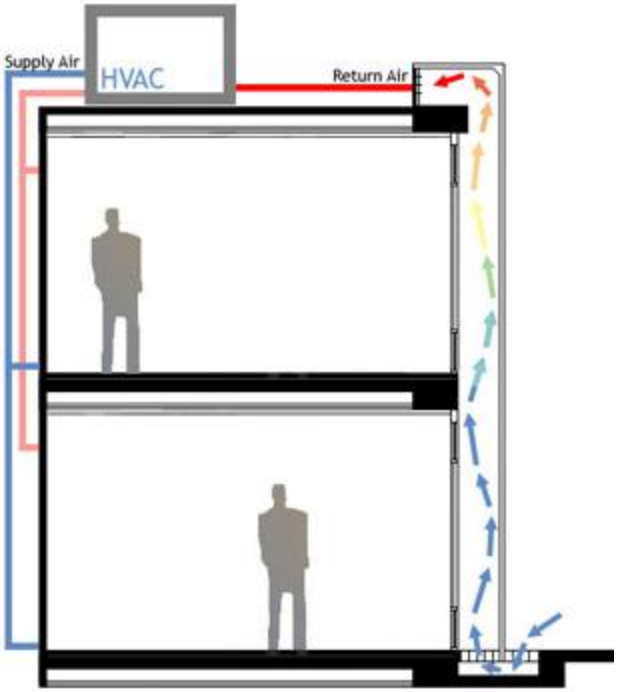
- **Solar Shading…how?**
  - Spectrally Selective Glazing
  - Manual and/or Automated Louvers
  - Design Shading for Each Façade
  - Integrate with Photo-Sensors where applicable
  - Double Skin Façade Allows us to Maintain Architectural Uniformity



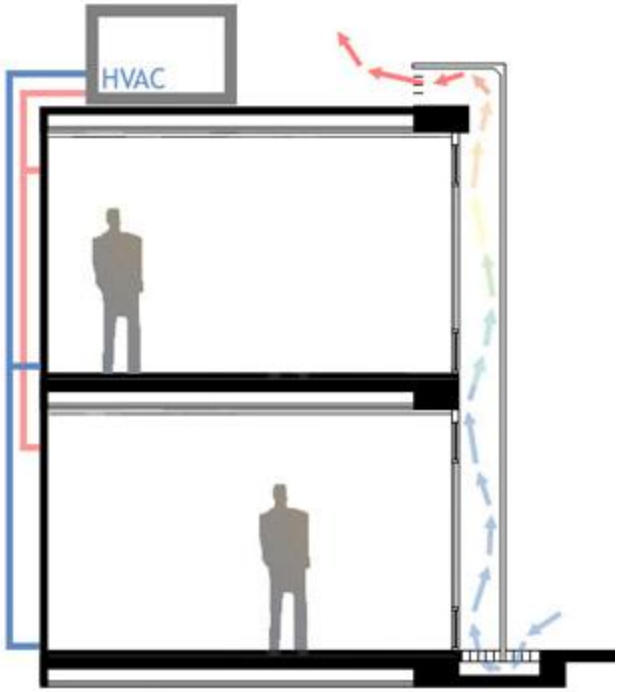
Double Skin Façade

Double Skin Façade

Heat Recovery

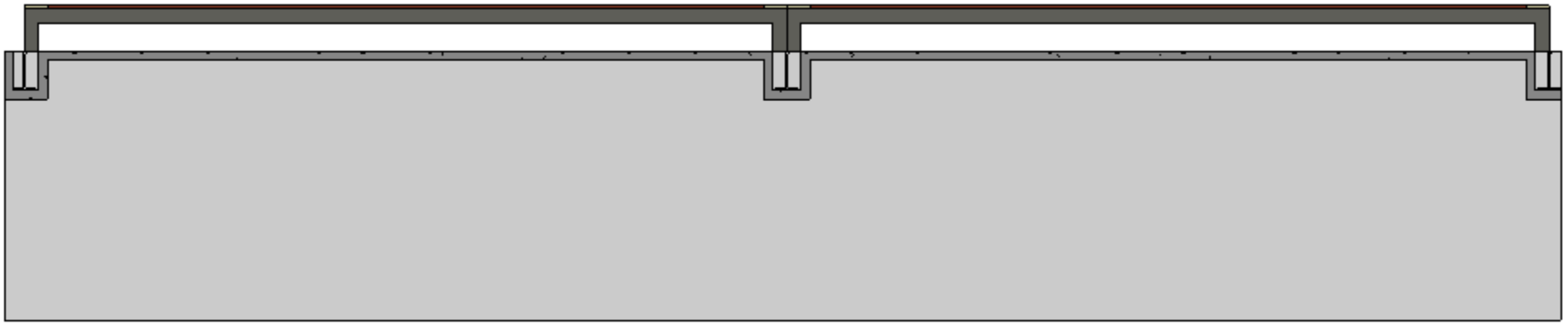


Heat Extraction



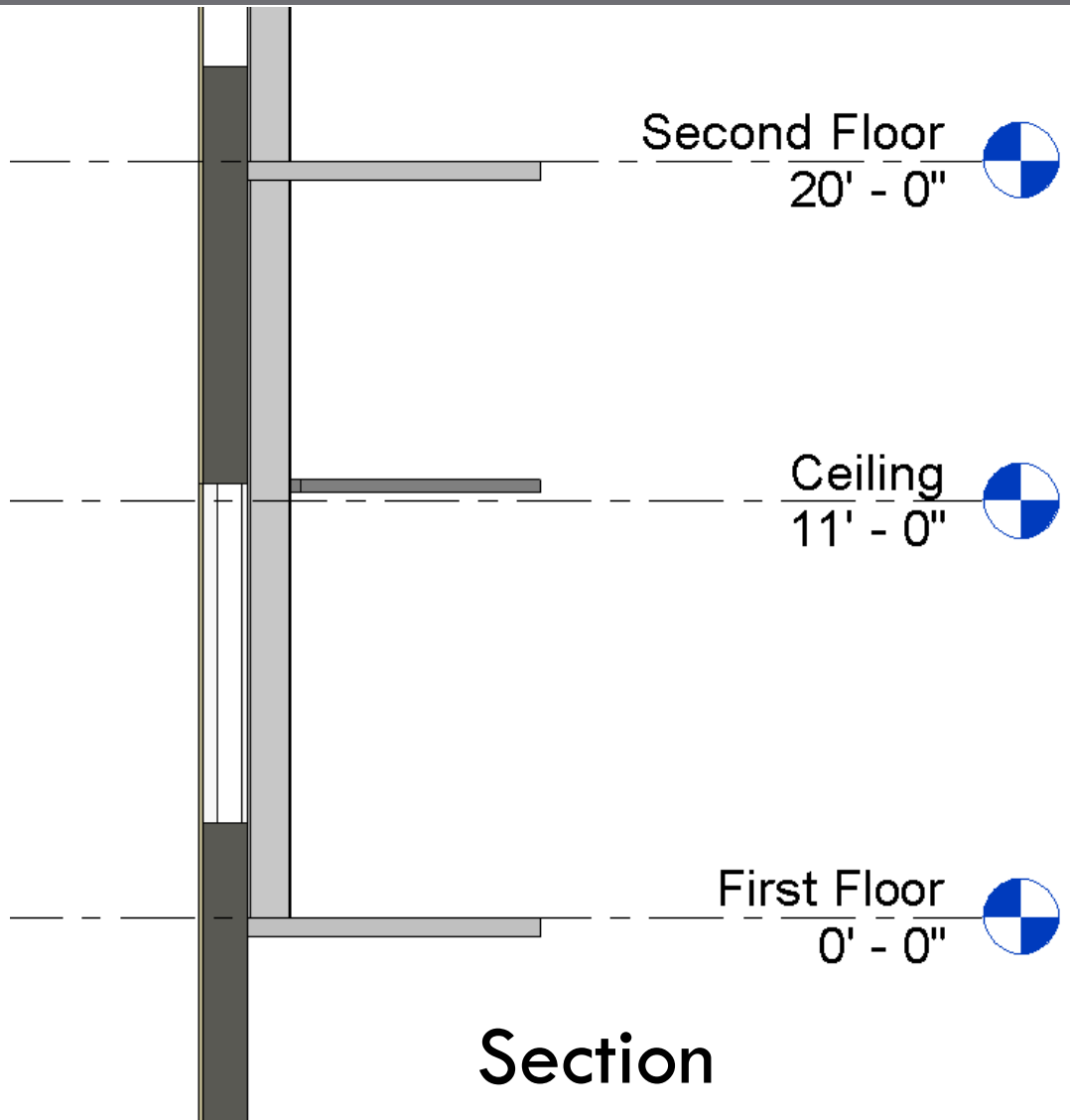
BuildingSTIMULUS
THE GREEN BUILDING SPECIALISTS

Facade



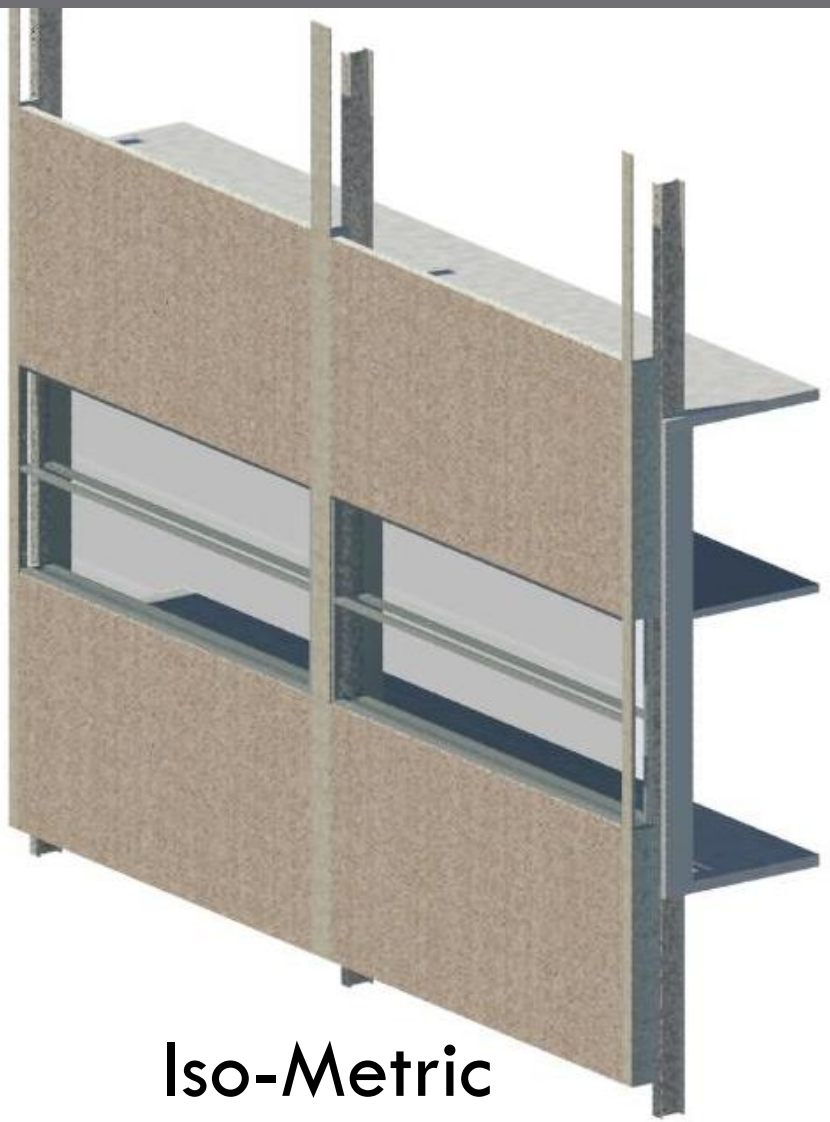
Plan-View

Facade



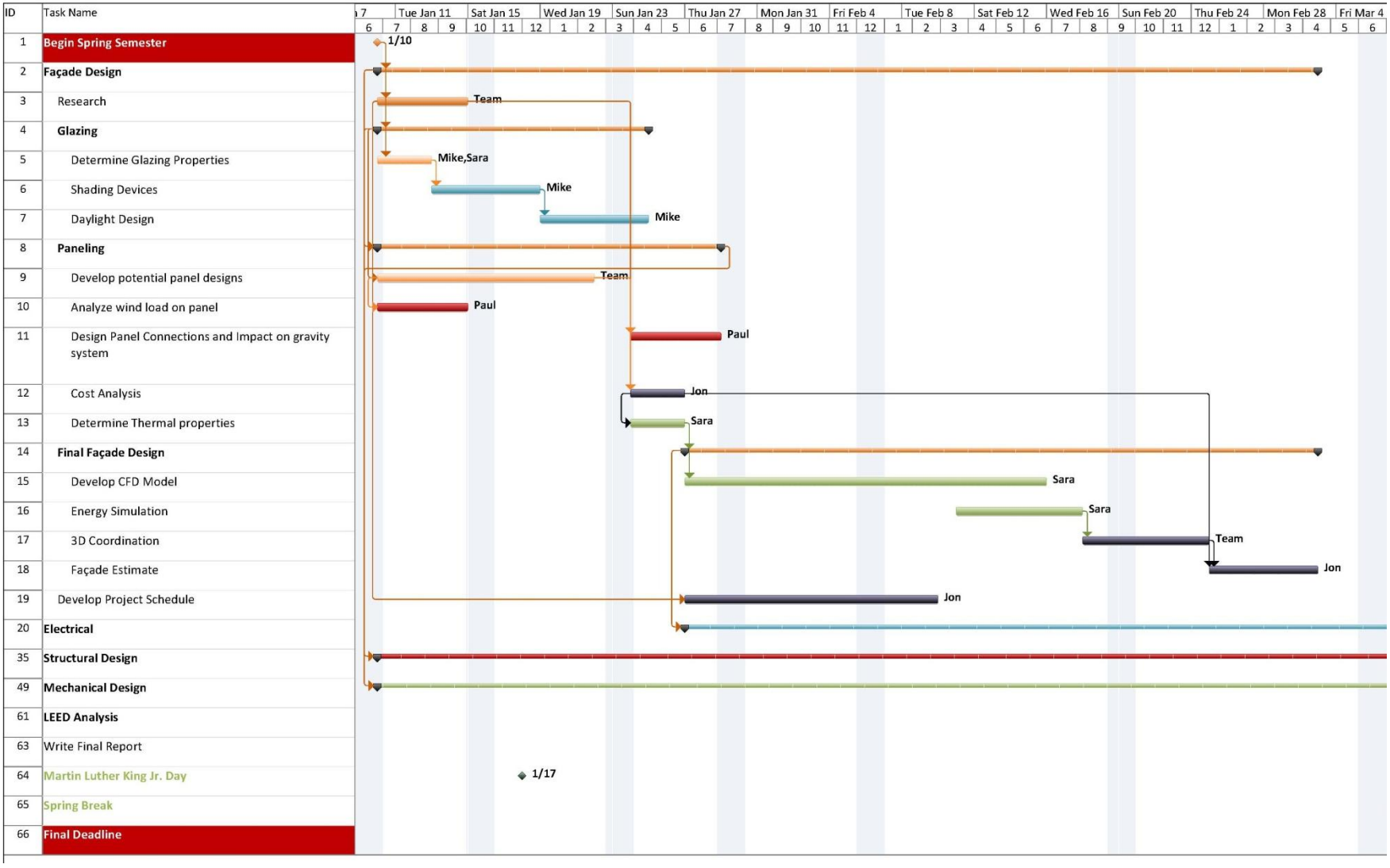
Section

Facade



Iso-Metric

Facade Schedule

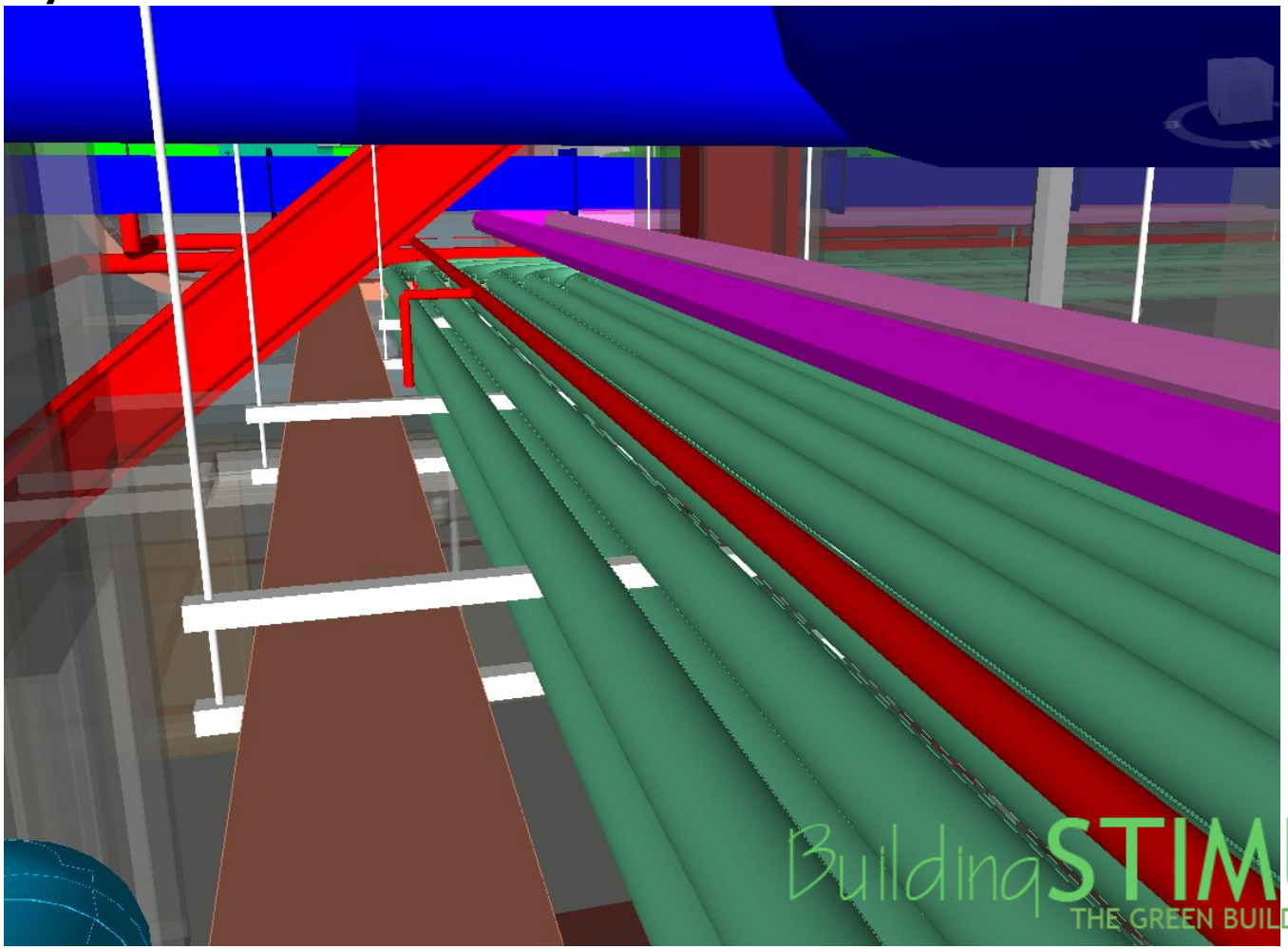


Design Efficiency

- Why
  - Energy Use
  - Source Emissions
  - Coordination Among Disciplines
  - Scheduling Relief

Design Efficiency

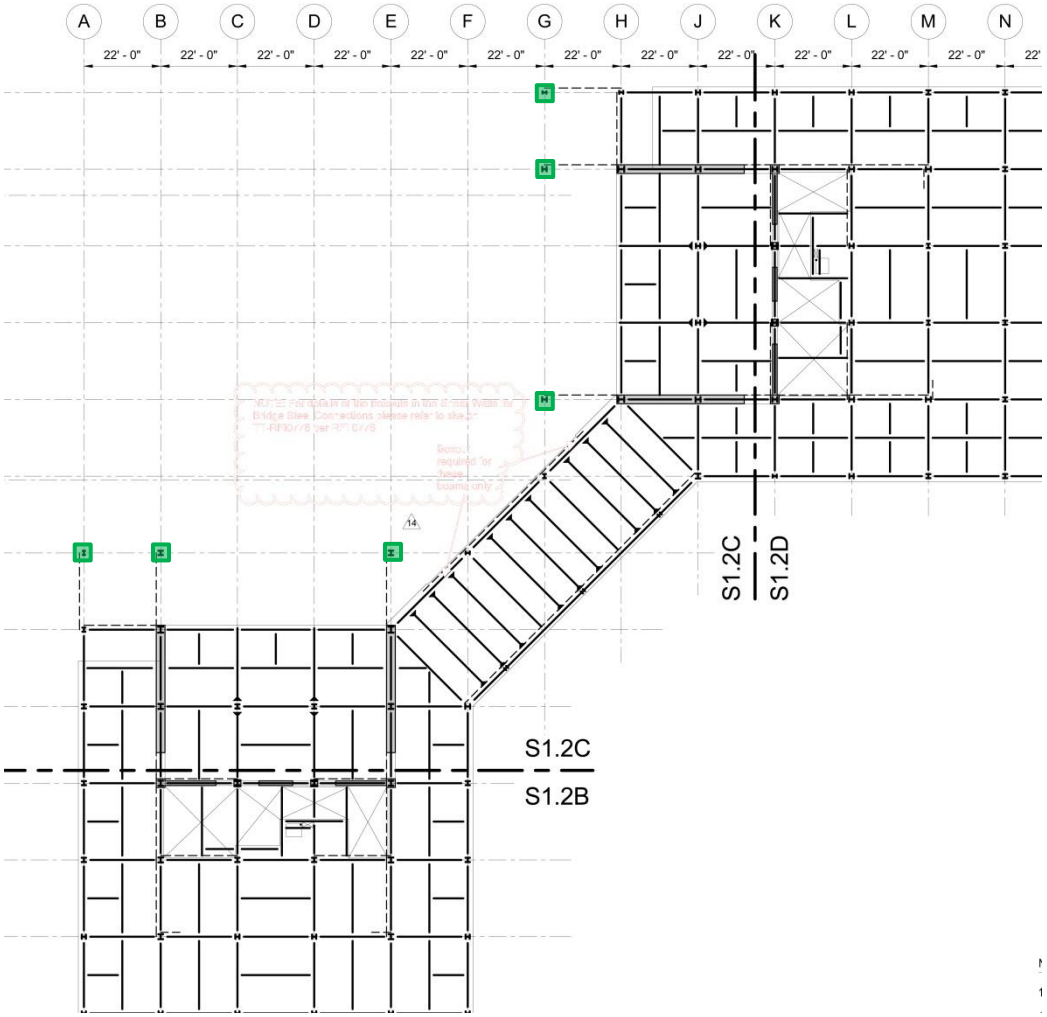
- Why



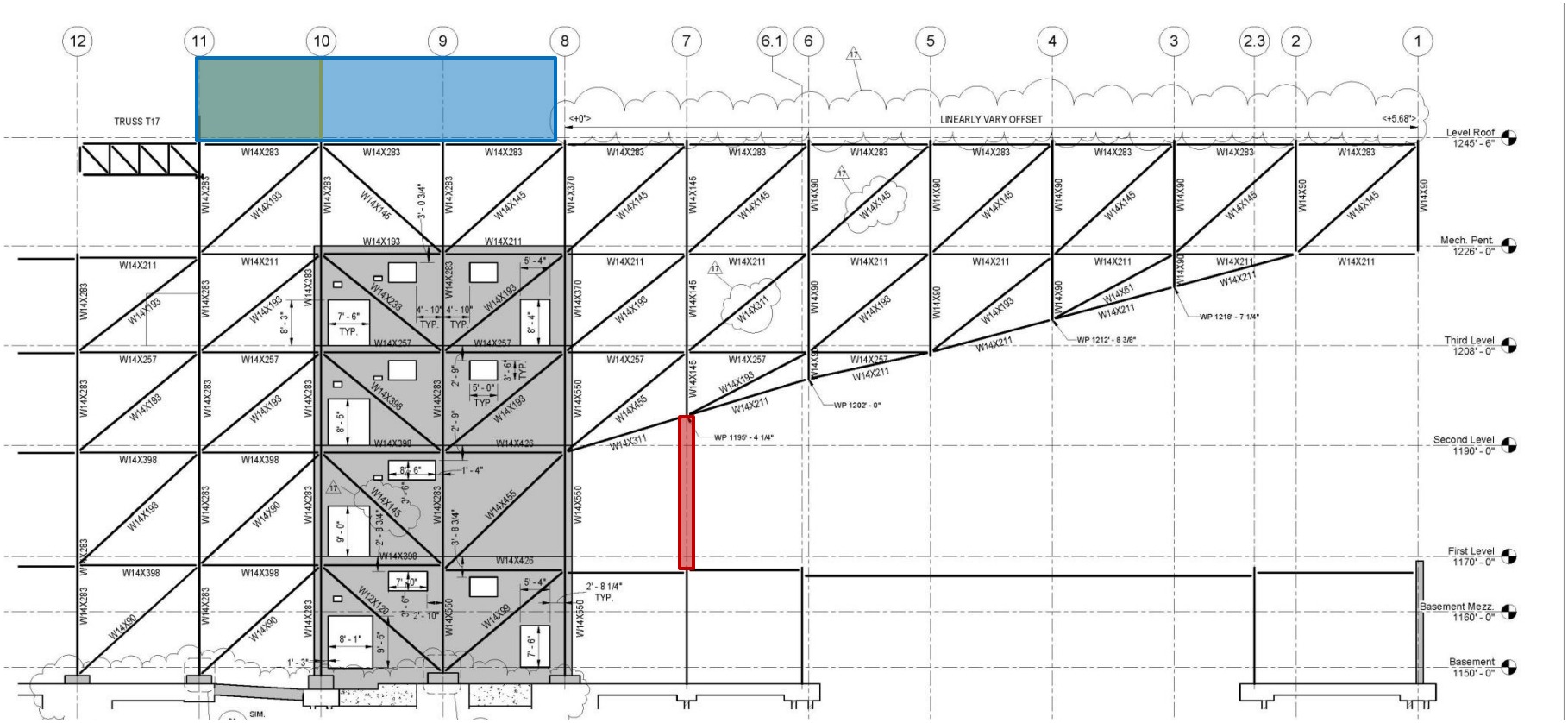
Design Efficiency

- How
  - Cantilever Truss Design
    - Switch bracing direction from compression to tension
    - Introduce additional columns
    - Add additional truss members to vertical truss support
  - Sustainability
    - Chilled Beams
    - Rooftop Mounted Wind Microturbines
  - Electrical Power Density

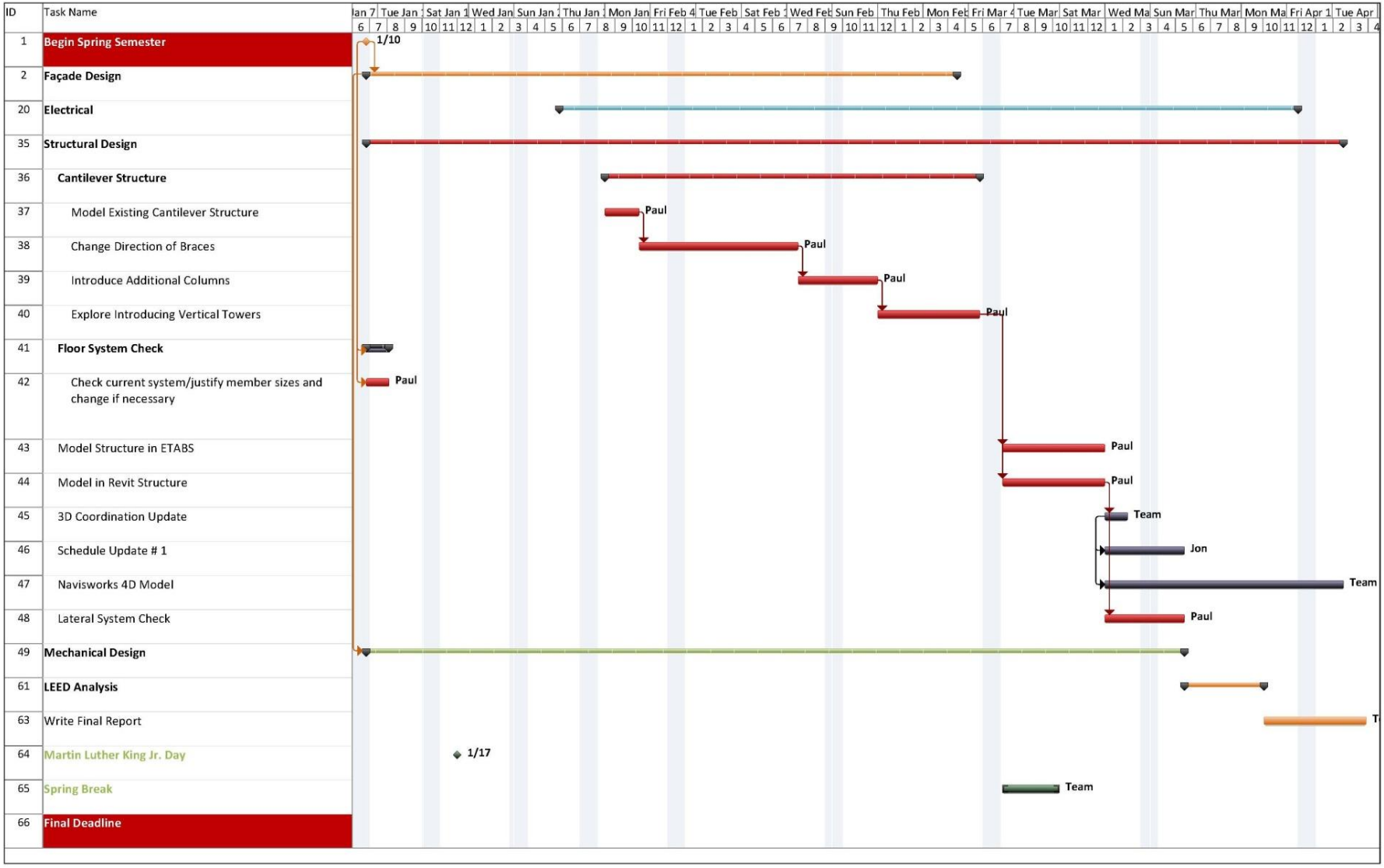
Cantilever Structure



Cantilever Structure

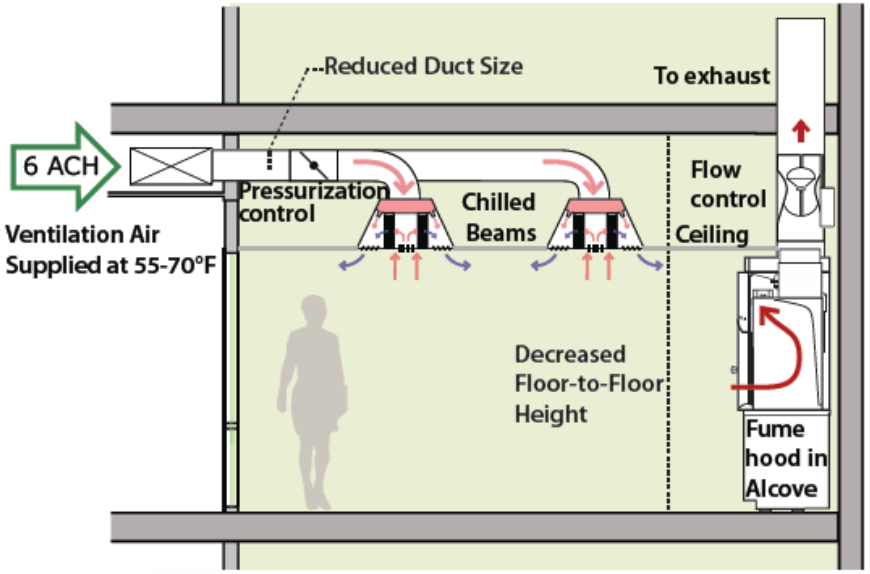


Structural Schedule

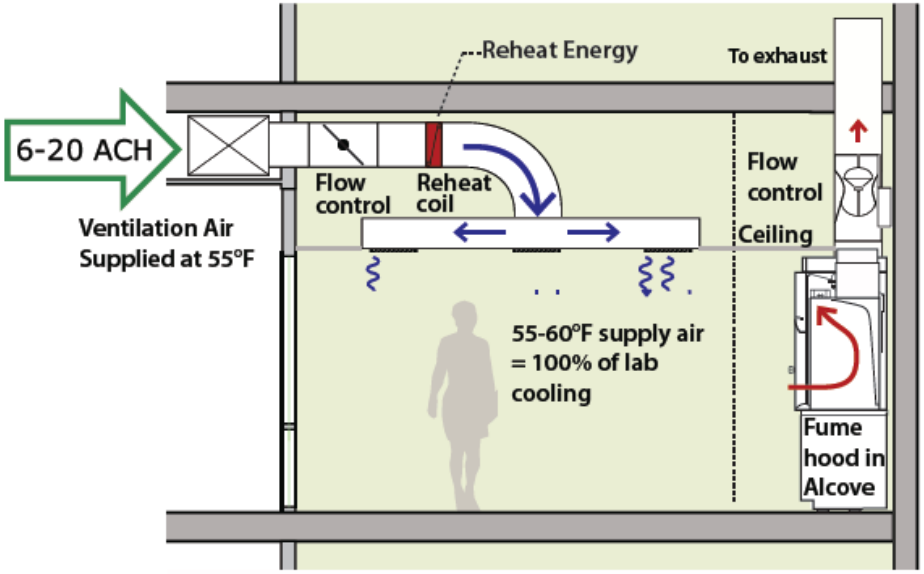


Chilled Beams

Chilled Beam System



VAV-Reheat System

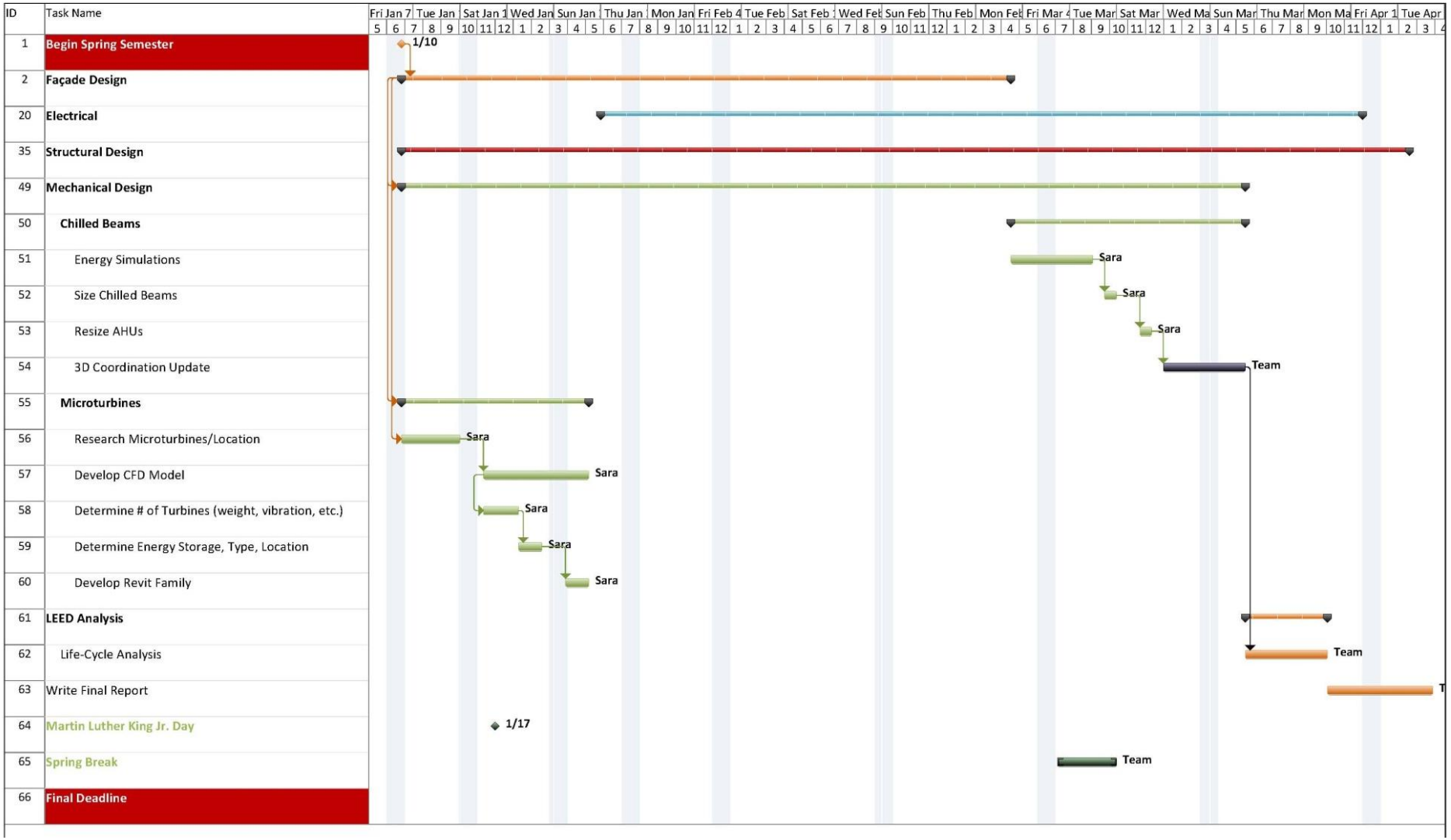


BuildingSTIMULUS
THE GREEN BUILDING SPECIALISTS

Energy Sources: Wind Energy

BuildingSTIMULUS
THE GREEN BUILDING SPECIALISTS

Mechanical Schedule



Additional E/L Studies

Mike Lucas

BuildingSTIMULUS
THE GREEN BUILDING SPECIALISTS

Electrical Depths

- Short Circuit Analysis (Hand Calculation)
  - Service Entrance to
  - Switchgear “MDS-01B” to
  - Switchboard “SDP-2D”1 to
  - Distribution Panel “LB-3D1/2”

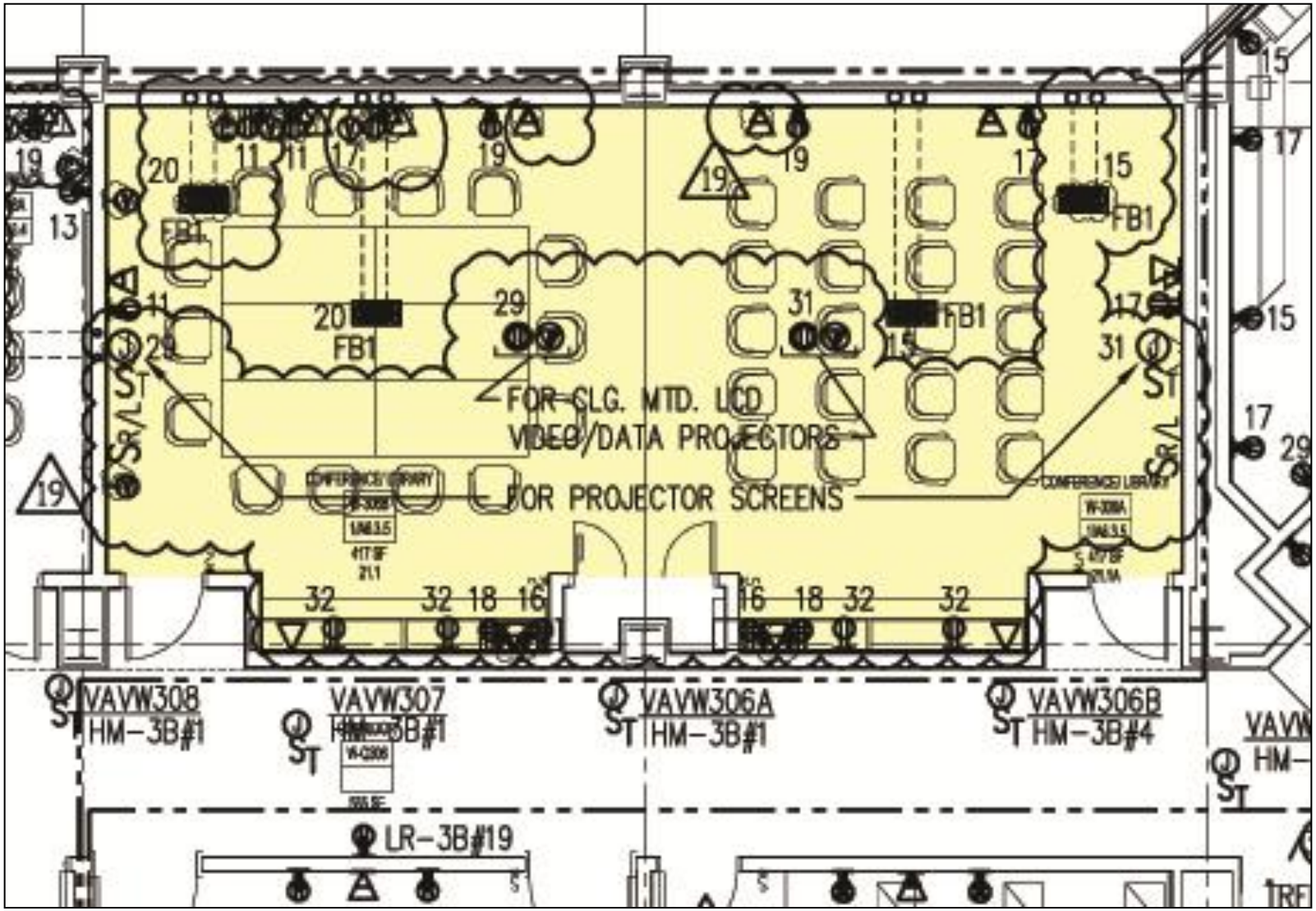
Electrical Depths

- SKM Analysis
  - Model Existing System

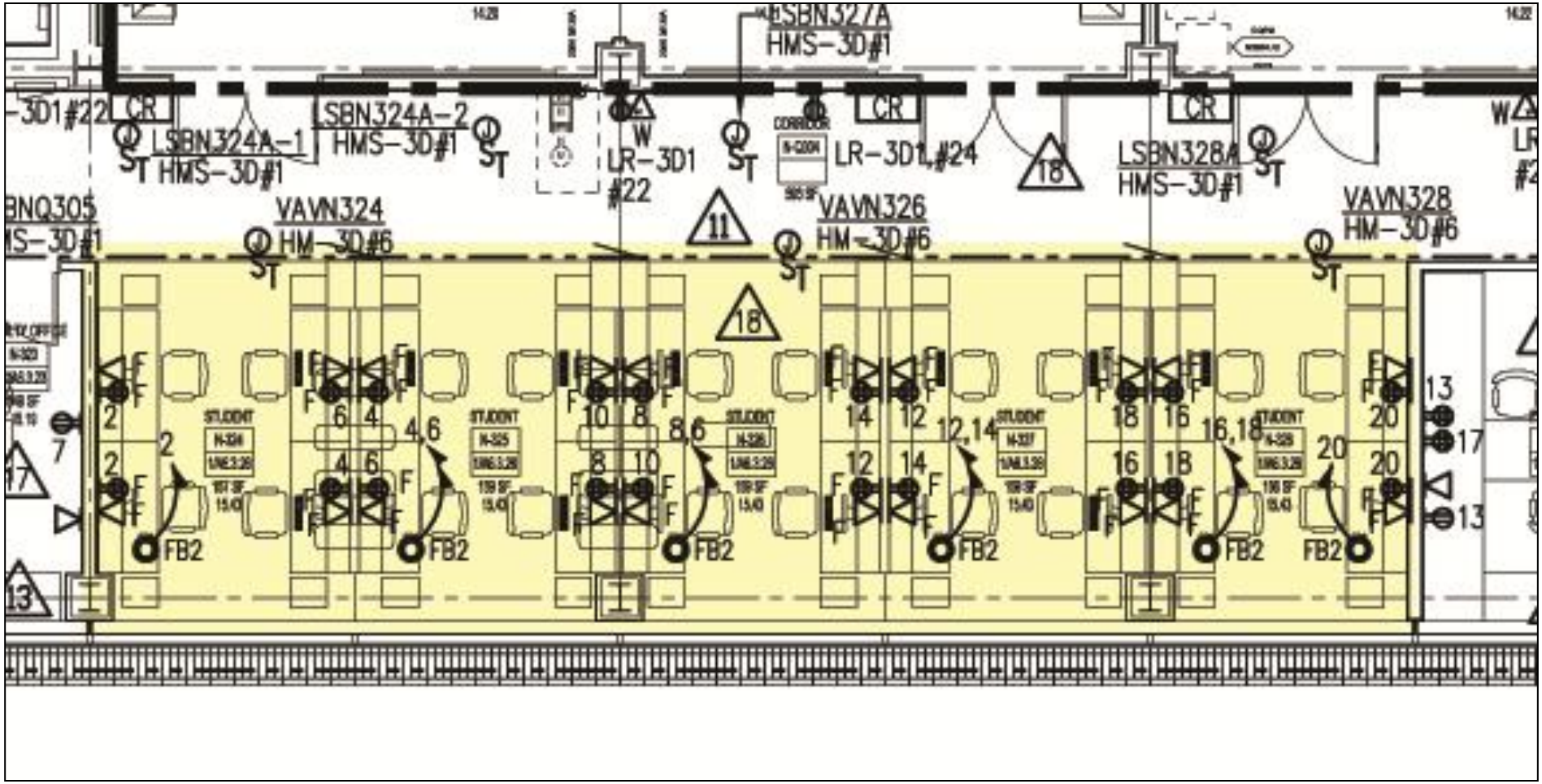
- Revit Modeling
  - Circuit 3rd floor electrical components .
  - Circuit 3rd floor Mechanical Equipment.
  - Create 3rd floor Panel Schedules.
  - Model Distribution Equipment.
  - Model branch conduit in problematic areas.

Lighting Spaces: Plaza

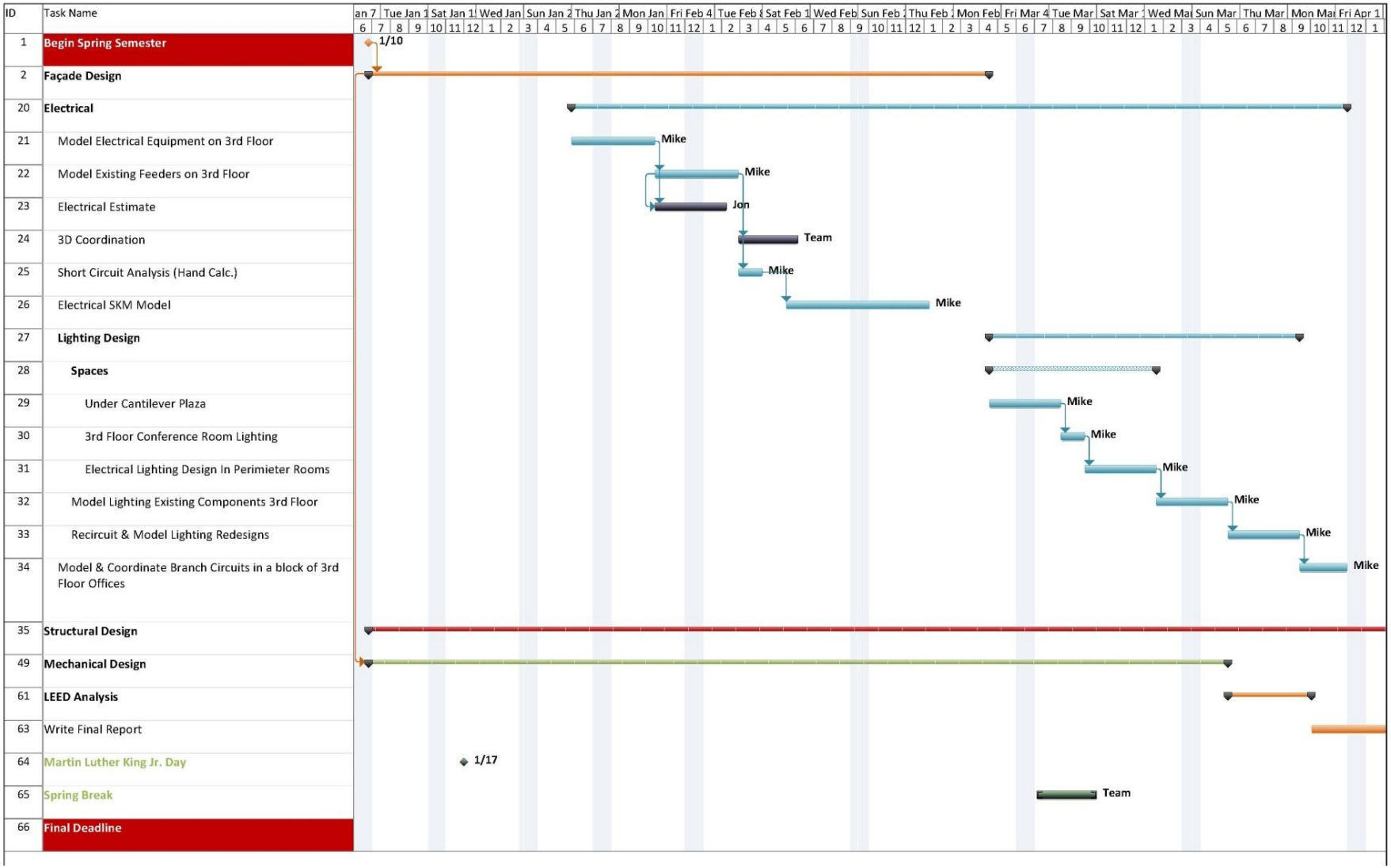
Lighting Spaces: Conference Room



Lighting Spaces: Study Area



Electrical Schedule

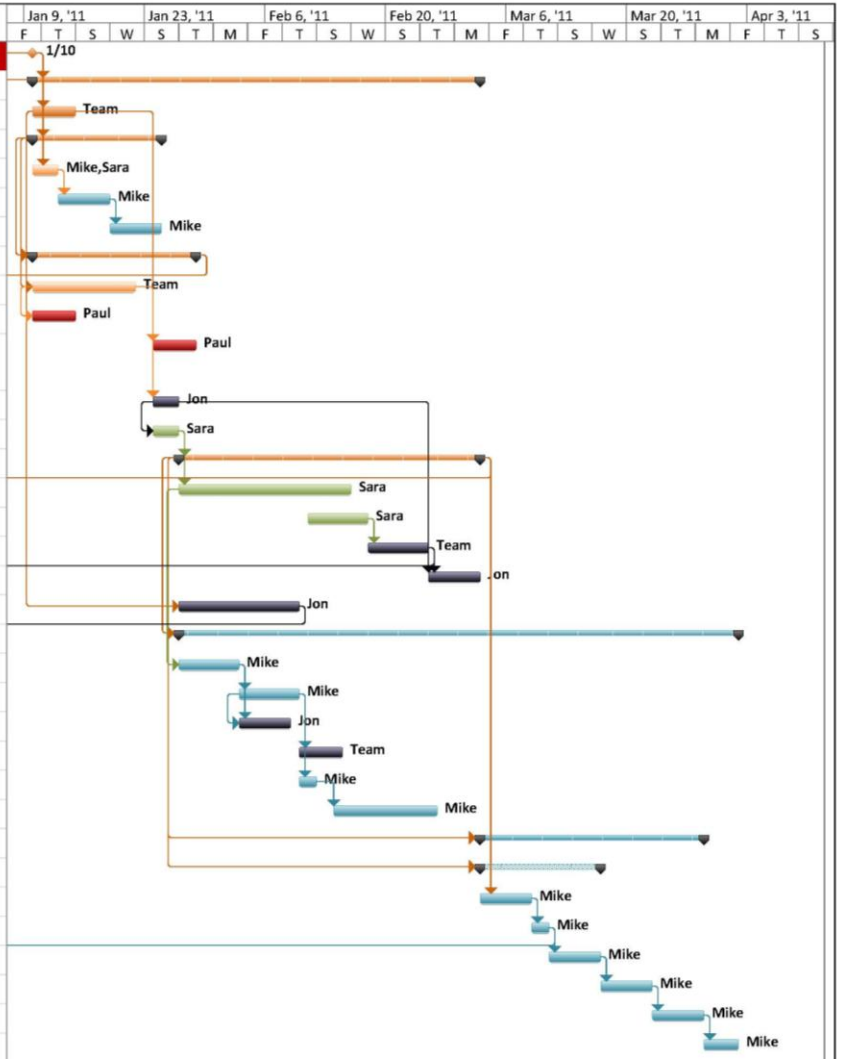


Design Development Schedule

BuildingSTIMULUS
THE GREEN BUILDING SPECIALISTS

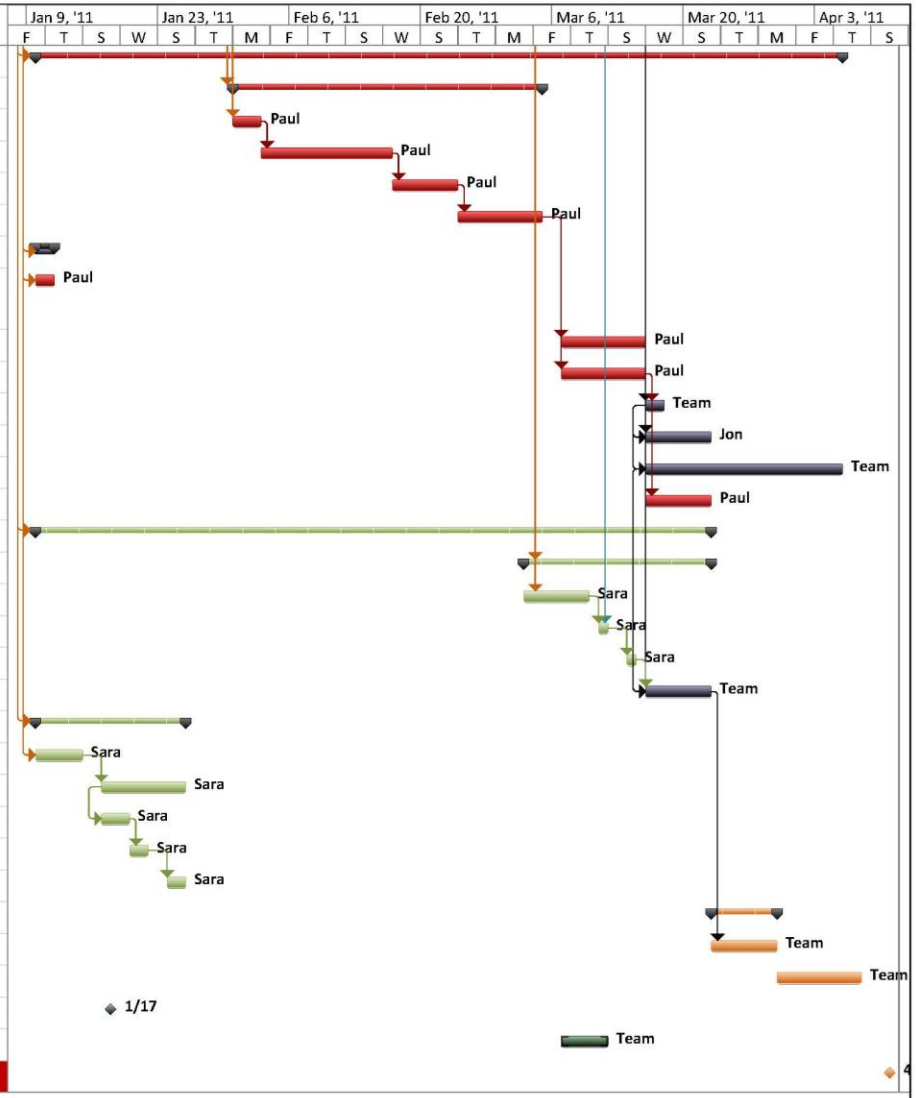
Design Development Schedule

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		**Begin Spring Semester**	**0 days**	**Mon 1/10/11**	**Mon 1/10/11**		
2		**Façade Design**	**38 days**	**Mon 1/10/11**	**Wed 3/2/11**	**1**	
3		Research	5 days	Mon 1/10/11	Fri 1/14/11	1	Team
4		**Glazing**	**11 days**	**Mon 1/10/11**	**Mon 1/24/11**	**1**	
5		Determine Glazing Properties	3 days	Mon 1/10/11	Wed 1/12/11	1	Mike,Sara
6		Shading Devices	4 days	Thu 1/13/11	Tue 1/18/11	5	Mike
7		Daylight Design	4 days	Wed 1/19/11	Mon 1/24/11	6	Mike
8		**Paneling**	**15 days**	**Mon 1/10/11**	**Fri 1/28/11**	**4SS**	
9		Develop potential panel designs	10 days	Mon 1/10/11	Fri 1/21/11	4SS	Team
10		Analyze wind load on panel	5 days	Mon 1/10/11	Fri 1/14/11	9SS	Paul
11		Design Panel Connections and Impact on gravity system	5 days	Mon 1/24/11	Fri 1/28/11	9	Paul
12		Cost Analysis	3 days	Mon 1/24/11	Wed 1/26/11	9,3	Jon
13		Determine Thermal properties	3 days	Mon 1/24/11	Wed 1/26/11	12SS	Sara
14		**Final Façade Design**	**25 days**	**Thu 1/27/11**	**Wed 3/2/11**	**13**	
15		Develop CFD Model	14 days	Thu 1/27/11	Tue 2/15/11	13	Sara
16		Energy Simulation	5 days	Fri 2/11/11	Thu 2/17/11		Sara
17		3D Coordination	5 days	Fri 2/18/11	Thu 2/24/11	16	Team
18		Façade Estimate	4 days	Fri 2/25/11	Wed 3/2/11	17,12	Jon
19		Develop Project Schedule	10 days	Thu 1/27/11	Wed 2/9/11	3SS	Jon
20		**Electrical**	**47 days**	**Thu 1/27/11**	**Fri 4/1/11**	**14SS**	
21		Model Electrical Equipment on 3rd Floor	5 days	Thu 1/27/11	Wed 2/2/11	15SS	Mike
22		Model Existing Feeders on 3rd Floor	5 days	Thu 2/3/11	Wed 2/9/11	21	Mike
23		Electrical Estimate	4 days	Thu 2/3/11	Tue 2/8/11	21,22SS	Jon
24		3D Coordination	3 days	Thu 2/10/11	Mon 2/14/11	22	Team
25		Short Circuit Analysis (Hand Calc.)	2 days	Thu 2/10/11	Fri 2/11/11	22	Mike
26		Electrical SKM Model	10 days	Mon 2/14/11	Fri 2/25/11	25	Mike
27		**Lighting Design**	**18 days**	**Thu 3/3/11**	**Mon 3/28/11**	**14SS**	
28		**Spaces**	**10 days**	**Thu 3/3/11**	**Wed 3/16/11**	**14SS**	
29		Under Cantilever Plaza	4 days	Thu 3/3/11	Tue 3/8/11	14	Mike
30		3rd Floor Conference Room Lighting	2 days	Wed 3/9/11	Thu 3/10/11	29	Mike
31		Electrical Lighting Design In Perimieter Rooms	4 days	Fri 3/11/11	Wed 3/16/11	30	Mike
32		Model Lighting Existing Components 3rd Floor	4 days	Thu 3/17/11	Tue 3/22/11	31	Mike
33		Recircuit & Model Lighting Redesigns	4 days	Wed 3/23/11	Mon 3/28/11	32	Mike
34		Model & Coordinate Branch Circuits in a block of 3rd Floor Offices	4 days	Tue 3/29/11	Fri 4/1/11	33	Mike

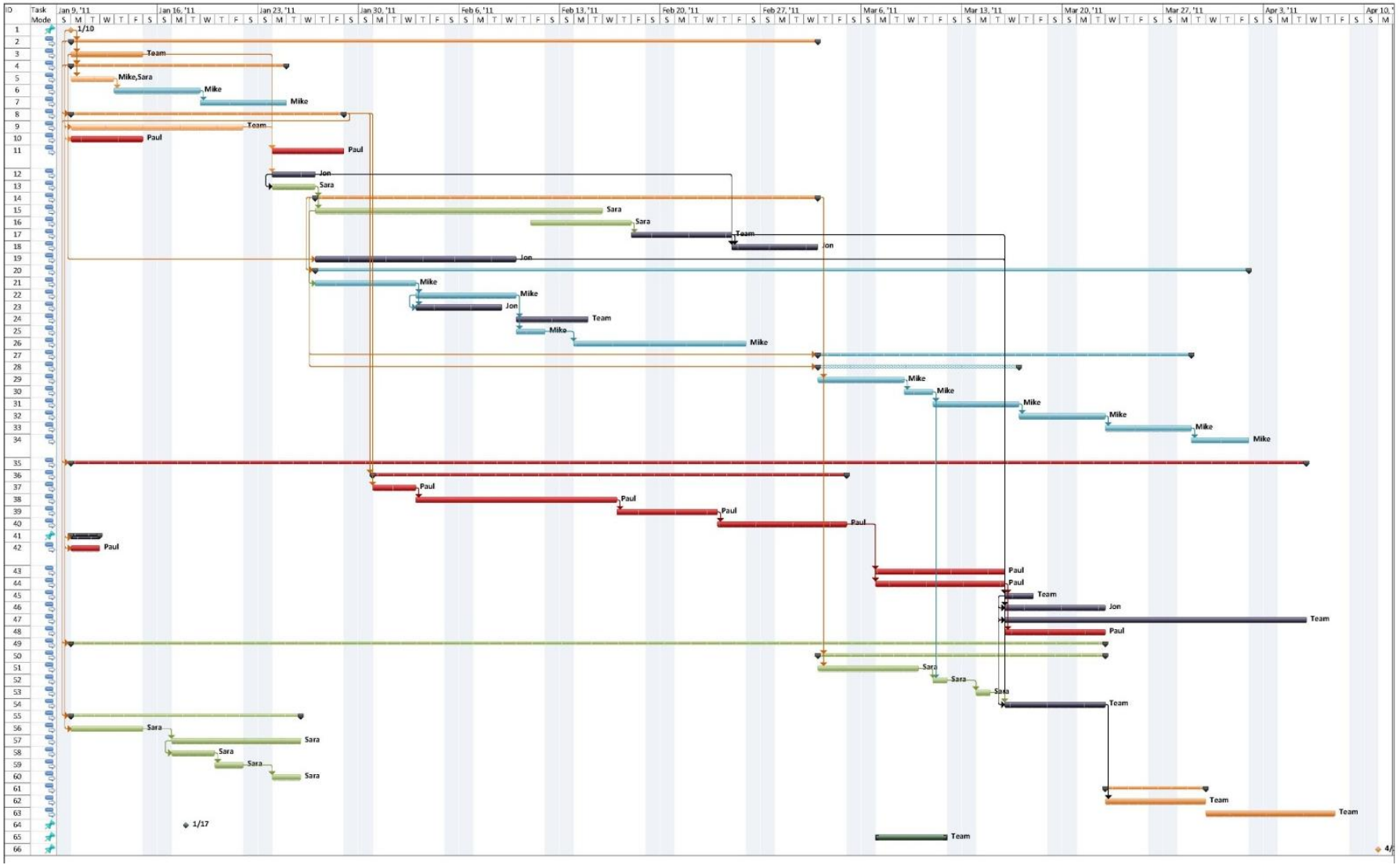


Design Development Schedule

ID	Task Mode	Task Name	Duration	Start	Finish	Predeces	Resource Names
35		**Structural Design**	**62 days**	**Mon 1/10/11**	**Tue 4/5/11**	**8**	
36		**Cantilever Structure**	**25 days**	**Mon 1/31/11**	**Fri 3/4/11**	**8**	
37		Model Existing Cantilever Structure	3 days	Mon 1/31/11	Wed 2/2/11	8	Paul
38		Change Direction of Braces	10 days	Thu 2/3/11	Wed 2/16/11	37	Paul
39		Introduce Additional Columns	5 days	Thu 2/17/11	Wed 2/23/11	38	Paul
40		Explore Introducing Vertical Towers	7 days	Thu 2/24/11	Fri 3/4/11	39	Paul
41		**Floor System Check**	**2 days**	**Mon 1/10/11**	**Tue 1/11/11**	**1SS**	
42		Check current system/justify member sizes and change if necessary	2 days	Mon 1/10/11	Tue 1/11/11	1SS	Paul
43		Model Structure in ETABS	7 days	Mon 3/7/11	Tue 3/15/11	40	Paul
44		Model in Revit Structure	7 days	Mon 3/7/11	Tue 3/15/11	40	Paul
45		3D Coordination Update	2 days	Wed 3/16/11	Thu 3/17/11	44,17	Team
46		Schedule Update # 1	5 days	Wed 3/16/11	Tue 3/22/11	45SS,19	Jon
47		Navisworks 4D Model	15 days	Wed 3/16/11	Tue 4/5/11	45SS	Team
48		Lateral System Check	5 days	Wed 3/16/11	Tue 3/22/11	44	Paul
49		**Mechanical Design**	**52 days**	**Mon 1/10/11**	**Tue 3/22/11**	**2SS**	
50		**Chilled Beams**	**14 days**	**Thu 3/3/11**	**Tue 3/22/11**	**14**	
51		Energy Simulations	5 days	Thu 3/3/11	Wed 3/9/11	14	Sara
52		Size Chilled Beams	1 day	Fri 3/11/11	Fri 3/11/11	51,30	Sara
53		Resize AHUs	1 day	Mon 3/14/11	Mon 3/14/11	52	Sara
54		3D Coordination Update	5 days	Wed 3/16/11	Tue 3/22/11	53,47SS	Team
55		**Microturbines**	**12 days**	**Mon 1/10/11**	**Tue 1/25/11**	**2SS**	
56		Research Microturbines/Location	5 days	Mon 1/10/11	Fri 1/14/11	2SS	Sara
57		Develop CFD Model	7 days	Mon 1/17/11	Tue 1/25/11	56	Sara
58		Determine # of Turbines (weight, vibration, etc.)	3 days	Mon 1/17/11	Wed 1/19/11	57SS	Sara
59		Determine Energy Storage, Type, Location	2 days	Thu 1/20/11	Fri 1/21/11	58	Sara
60		Develop Revit Family	2 days	Mon 1/24/11	Tue 1/25/11	59	Sara
61		**LEED Analysis**	**5 days**	**Wed 3/23/11**	**Tue 3/29/11**		**Team**
62		Life-Cycle Analysis	5 days	Wed 3/23/11	Tue 3/29/11	54	Team
63		Write Final Report	7 days	Wed 3/30/11	Thu 4/7/11		Team
64		Martin Luther King Jr. Day	0 days	Mon 1/17/11	Mon 1/17/11		Team
65		Spring Break	5 days	Mon 3/7/11	Fri 3/11/11		Team
66		**Final Deadline**	0 days	Mon 4/11/11	Mon 4/11/11		Team



Inclusive Schedule



Conclusion


HAPPY HOLIDAYS!!!
wallpaper by SompyStyle.com hosted by Sompy.com
BuildingSTIMULUS
THE GREEN BUILDING SOLUTIONS
CRAZY-FRANKENSTEIN.COM

Structural Tasks & Tools

Primary Task	Secondary Task	Program(s) to be Used	Applicable Codes
Façade Redesign	Panel Design (Wind, Dead, Earth Quake, Connection Design, etc.)	pca Slab, ETABS	ASCE7-05
Cantilever Structure	Model Existing Cantilever Structure	SAP 2000, ETABS	
	Change Direction of Braces	SAP 2000, ETABS, RAM Connection	AISC Steel Manual 13ed
	Introduce Additional Columns	SAP 2000, ETABS, RAM SColumn	AISC Steel Manual 13ed
	Explore removing concrete shear walls	SAP 2000, ETABS	
	Explore introducing further verticality to truss	SAP 2000, ETABS, RAM SColumn, RAM Connection	AISC Steel Manual 13ed
Floor Systems	Investigate Current System Efficiency	ETABS	AISC Steel Manual 13ed, AISC Steel Design Guide 11
Model Redesigned Structure	Model in ETABS for potential import to Revit Structure	ETABS, Revit Structure	

Mechanical Tasks & Tools

Primary Task	Secondary Task	Program(s) to be Used
Air Distribution	Chilled Beams	TRANE Trace
	Energy Simulation	TRANE Trace
	BIM Modeling	Revit MEP 2011
Façade Redesign	Thermal Properties Model (CFD)	MS Excel
	Glazing	TRANE Trace
	BIM Modeling	Revit MEP 2011
Wind Microturbines	Calculations	MS Excel
	CFD Model	
	BIM Modeling	Revit MEP 2011

Electrical & Lighting Tasks & Tools

Primary Task	Secondary Task	Program(s) to be Used
Lighting Redesigns	Layout & Performance	AGI 32
	BIM Modeling	Revit MEP 2011
Façade Redesign	Daylight Integration	AGi32, Daysim, and/or Ecotech
	Glazing	AGi32, Daysim, Trace
	BIM Modeling	Revit MEP 2011
Short Circuit Analysis	Calculations	MS Excel
Voltage Drop Calculations	Calculations	MS Excel
Branch Circuiting	Planning & Coordination	Revit MEP 2011

CM Tasks & Tools

Primary Task	Secondary Task	Program(s) to be Used	Sources of Information
Façade Redesign	Panel Modeling	Revit Architecture	-
	Cost Analysis	RS Means	RS Means, Information from vendor(s)
	Schedule Impact	Microsoft Project	Information from vendor(s)
Structural Redesign	Building Height Cost Analysis	Revit Architecture, Revit Structure	MSC Cost Information, Local Building Cost Information
	Schedule Impact	Microsoft Project	On-Site Production Rates
	Cost Analysis	RS Means	-
3D Coordination	Clash Detection	Navisworks	Revit Models
	4D Model	Navisworks, Microsoft Project	-