

Starchitects and Jackhammers

Fiona Cousins

Construction – and the built environment

© HG Esch Fotografie/Gale International Korea (GIK)



© Thomas Graham

© Prakash Patel/Gensler



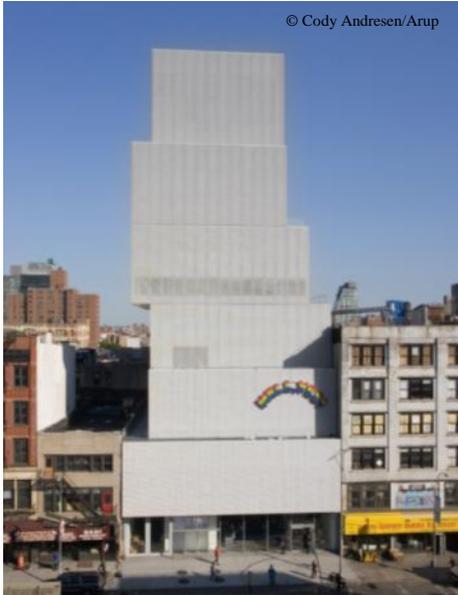
© Luca Vignelli HRPT



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Buildings or ‘Vertical Infrastructure’



What is this space for?



© Hufton+Crow

Initial requirements



Developing requirements...



© Montestier

Developing requirements...



Developing requirements...

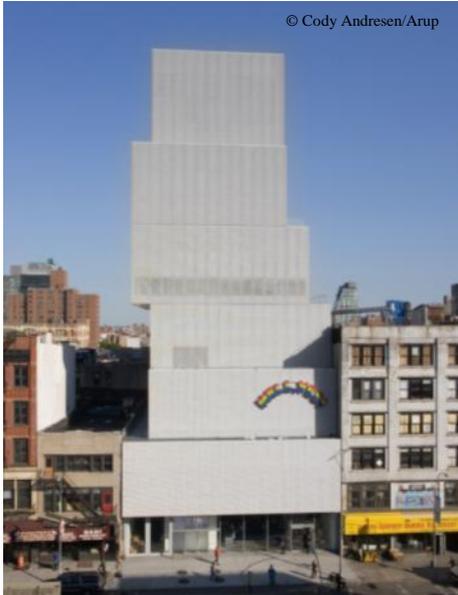


© The Novogratz

Developing requirements:



Buildings or 'Vertical Infrastructure'



“Requirements engineering (RE) encompasses all the **interdisciplinary** activities involved in **determining, documenting** and **maintaining** an agreed set of requirements for a system, and for **tracing** these through to implementation. A specific concern is the development of practical techniques, methods, and tools to support these activities.”

© Minkette



© Mert Carpenter Photography

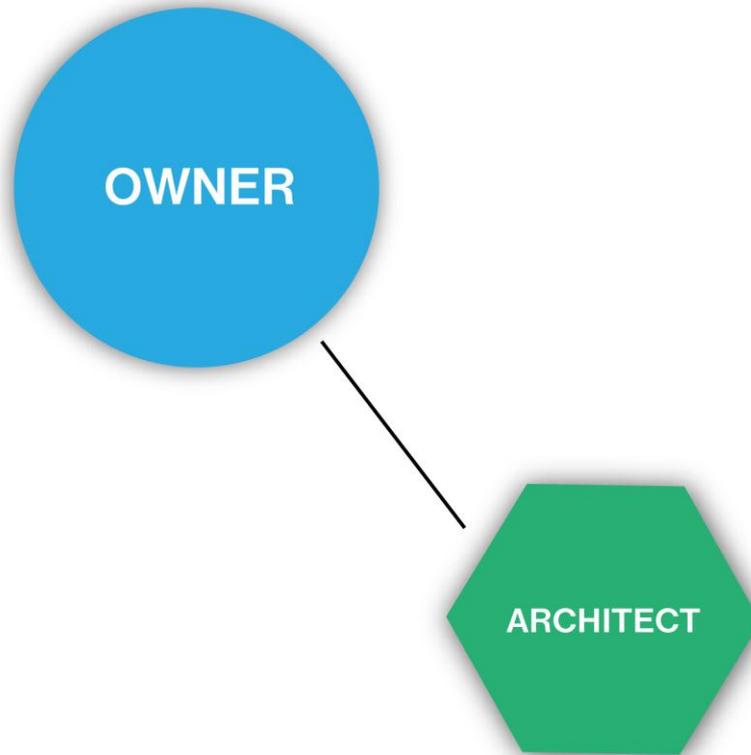


“Requirements engineering (RE) encompasses all the **interdisciplinary** activities involved in **determining**, **documenting** and **maintaining** an agreed set of requirements for a system, and for **tracing** these through to implementation. A specific concern is the development of practical techniques, methods, and tools to support these activities.”

I have an idea!



But what is that idea? Really?



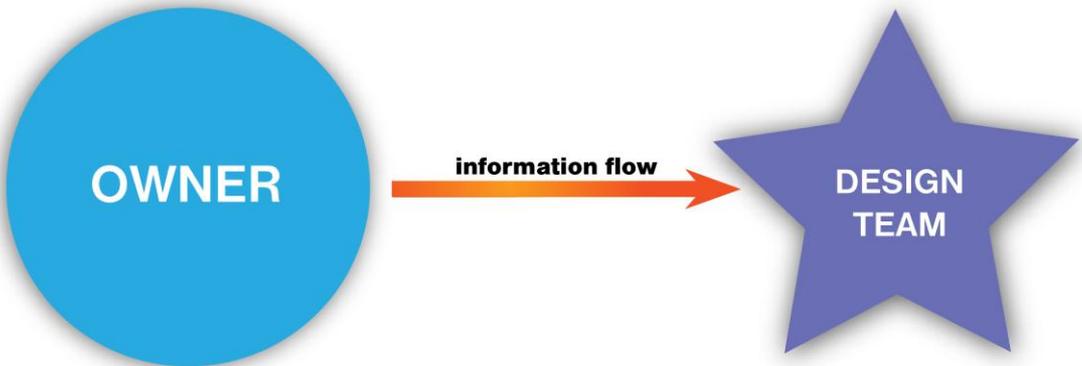
But what do I really want?



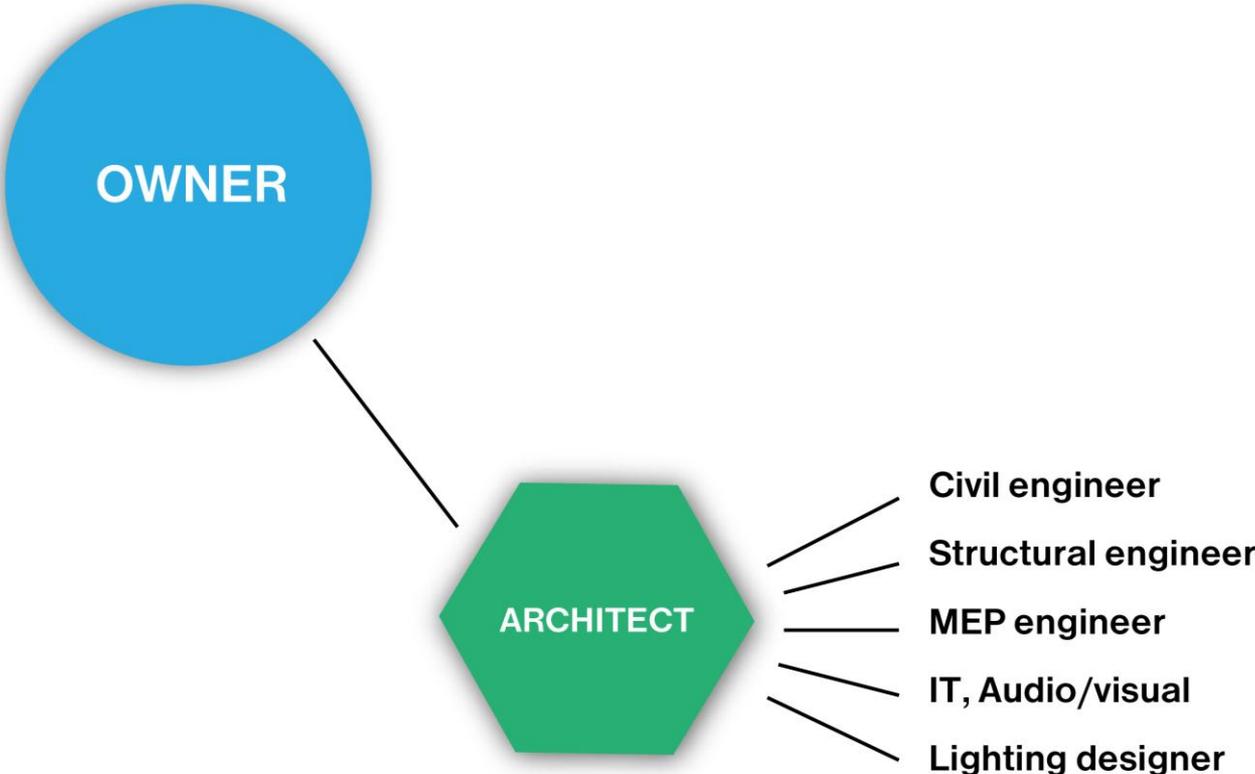
But what do I really want?



Information flow



I need a team!





Status: From SR.025

Room name	Patient area, Patient single	Placement:	99 - Revit sync demo / 01 - Patient monitoring	
Categorization		Areas	Status	
Drawing no:	Programmed	10.00	Created by	Jerving, Rolf,
Drawing name	Actual	15.16		juni 17, 2011
Geo. Room no.	Height:	2.44		1:58 PM
User room no	Perimeter:	15.59	Changed by	Johansen, Asmund,
				februar 10, 2012 11:23 AM

Description

Description of activities and functions

Monitoring, treatment, nursing of critically ill pat. in open or closed incubator. Care given from both sides simultaneously, 1-2 nurses.
Optimal monitoring of several patients on one screen. Access to pat. from all sides. Sample drawing/bedside analysis. Occasional X-ray. Bedside reading/entering of EMR. Space for 1-2 relatives in bed/recliner by the incubator.
Preparing of some medicines. Storing some consumption goods.
Visual contact with work station as well as between NICU rooms.

Human traffic	Value	Specification
Persons, normally	3	
Persons, maximum	5	

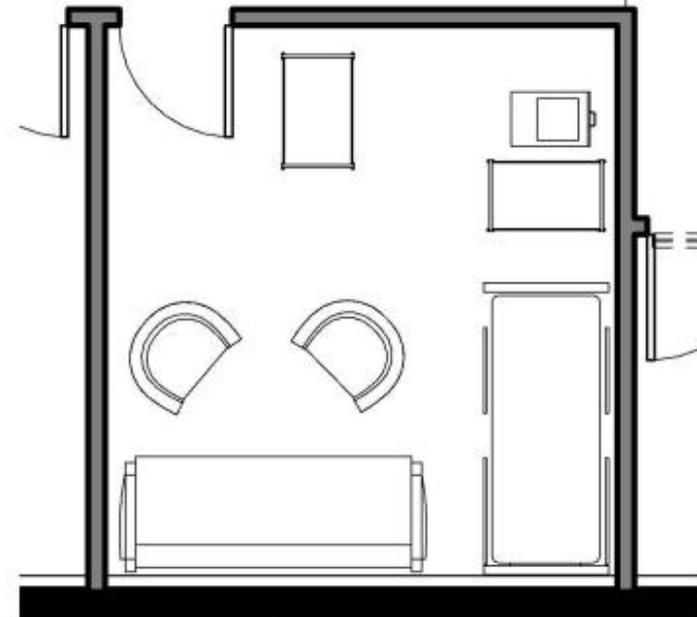
Design/building

Walls	Value	Specification	General for the room	Value	Specification
Wall mounted equipment	<input checked="" type="checkbox"/>	See equipment list	Special surface requirements	<input checked="" type="checkbox"/>	Smooth surfaces, easy to clean
Floor/top	Value	Specification	View/insight to other functions	<input checked="" type="checkbox"/>	Visual contact between work station and room, with possibility to shield
Electrostatic protection	<input checked="" type="checkbox"/>	elektromedisk utstyr hjertener			
Other	Aesthetics and acoustics should be emphasized.				

Windows and doors

Doors	Value	Specification	Windows	Value	Specification
Door openings	<input checked="" type="checkbox"/>	bed			
Glass in doors	<input checked="" type="checkbox"/>	glass between rooms			
Sliding doors	<input checked="" type="checkbox"/>	towards corridor and between 2 and 2 rooms			
Openings without thresholds	<input checked="" type="checkbox"/>				
Daylight	<input checked="" type="checkbox"/>				

Room function no: 99.002



From Revit



© David Pear's Blog







“Requirements engineering (RE) encompasses all the **interdisciplinary** activities involved in **determining, documenting and maintaining** an agreed set of requirements for a system, and for **tracing** these through to implementation. A specific concern is the development of practical techniques, methods, and tools to support these activities.”

Support



Power

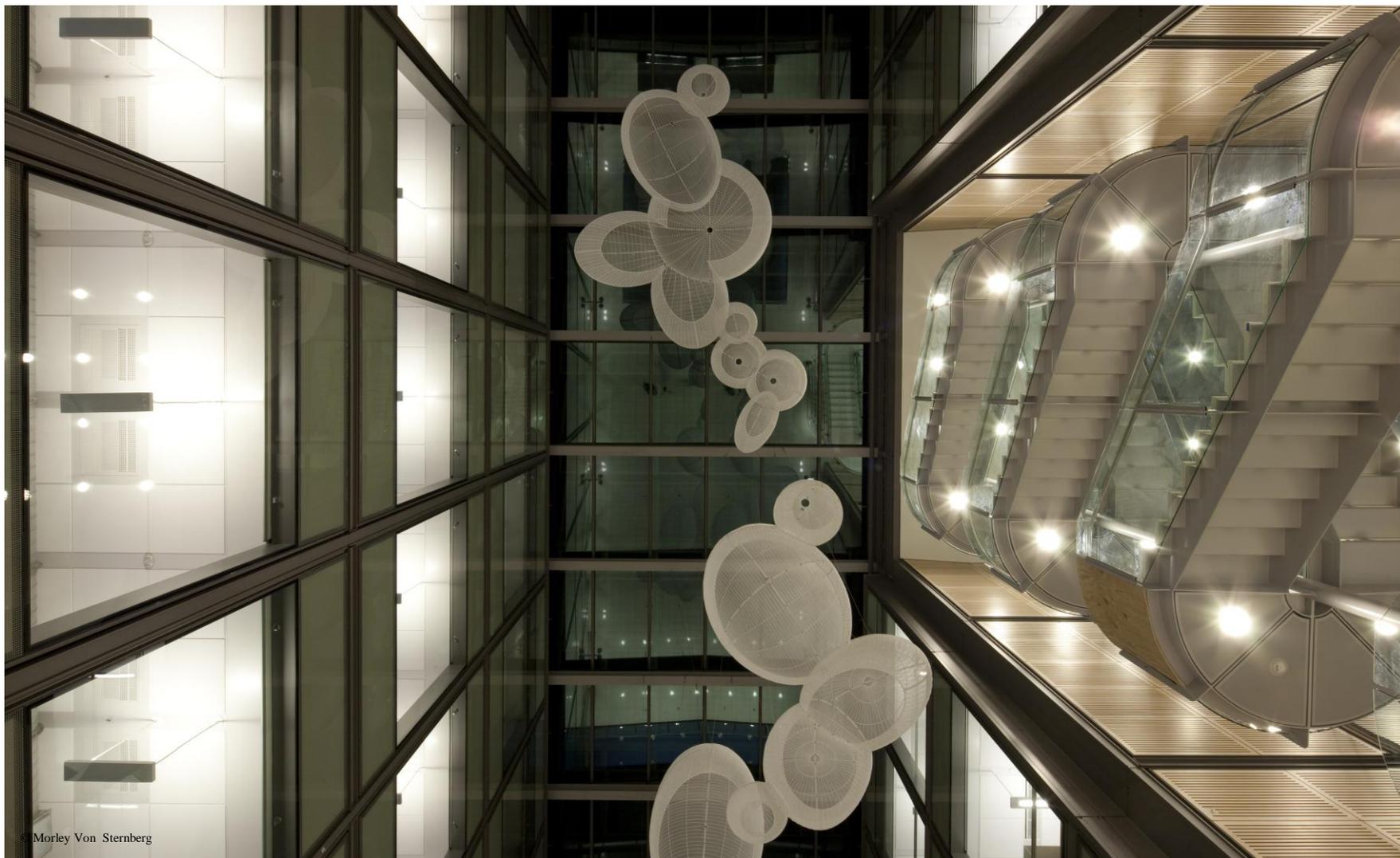
© Christian Richters



Comfort

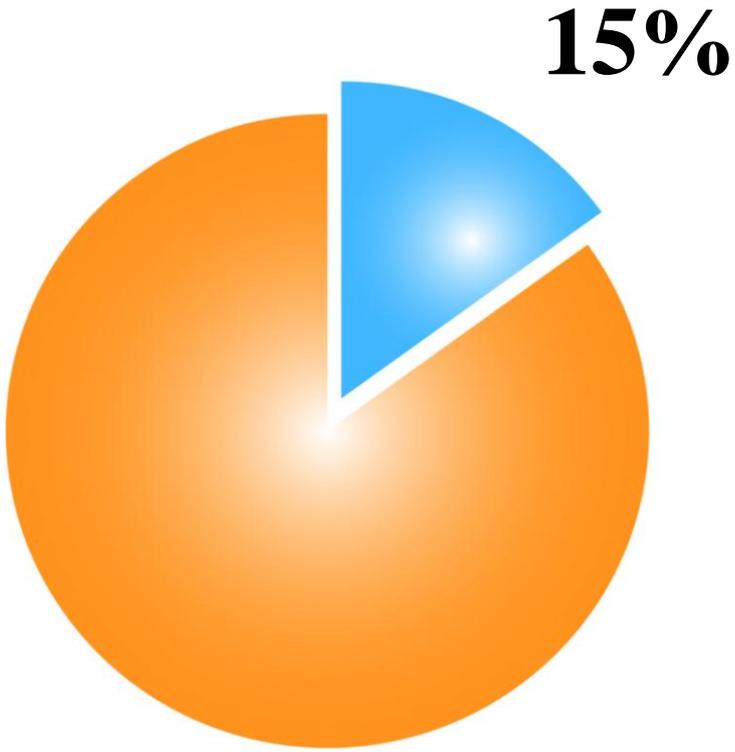


Inspiration

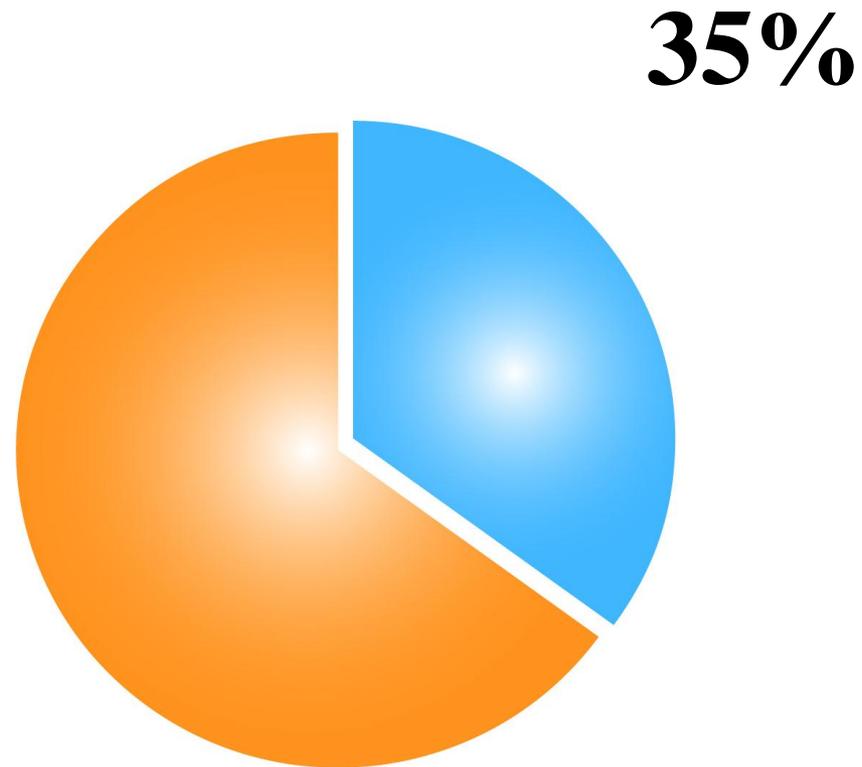


© Morley Von Sternberg

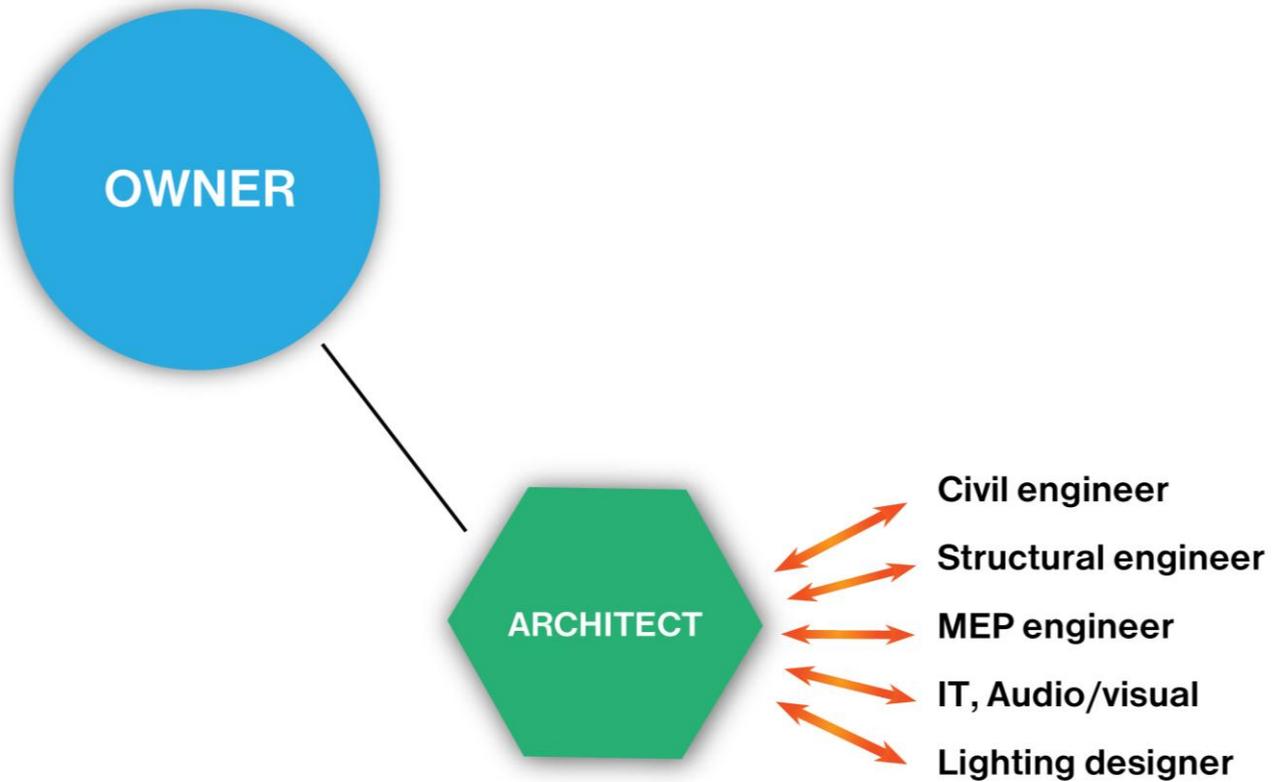
Space for Services



Space for Services, Circulation and Support



Information flow



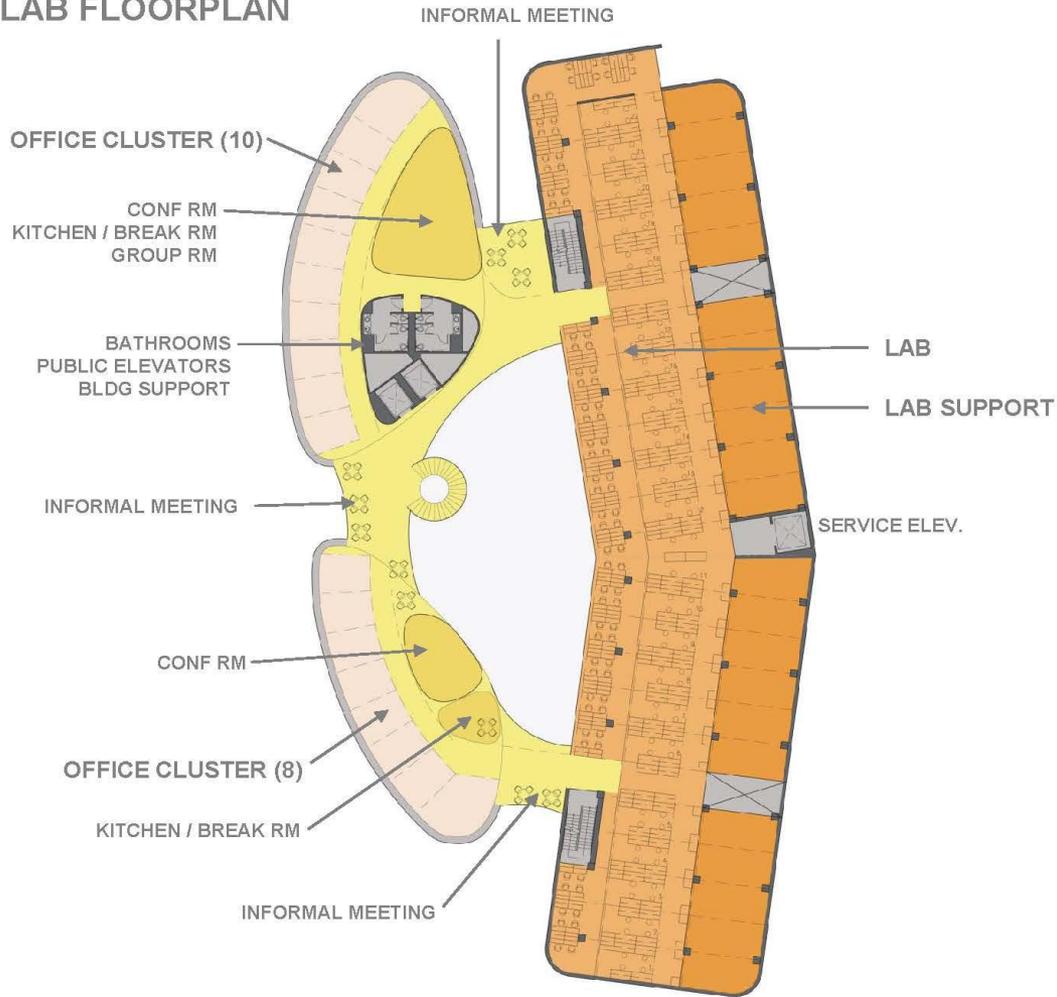
Concept Design - Massing



© Payette Associates

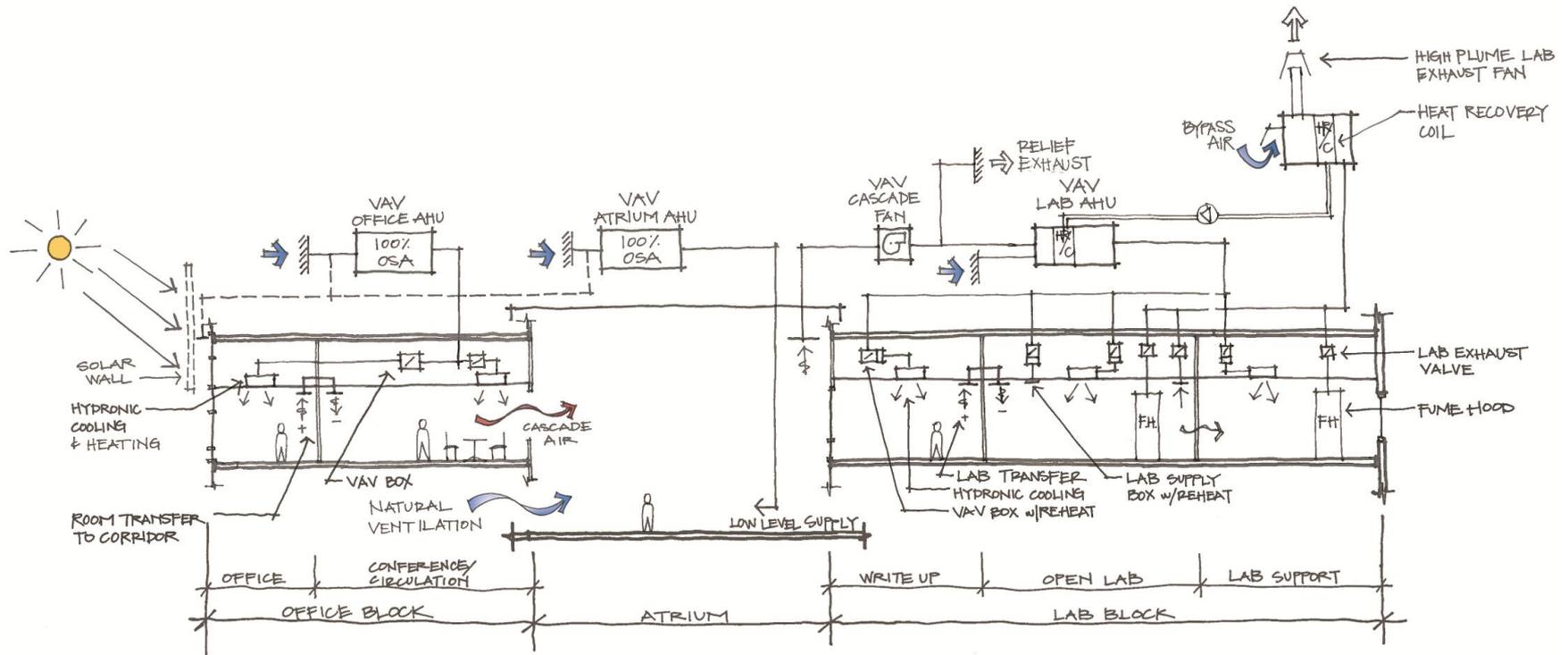
Concept Design – test fit

TYPICAL LAB FLOORPLAN



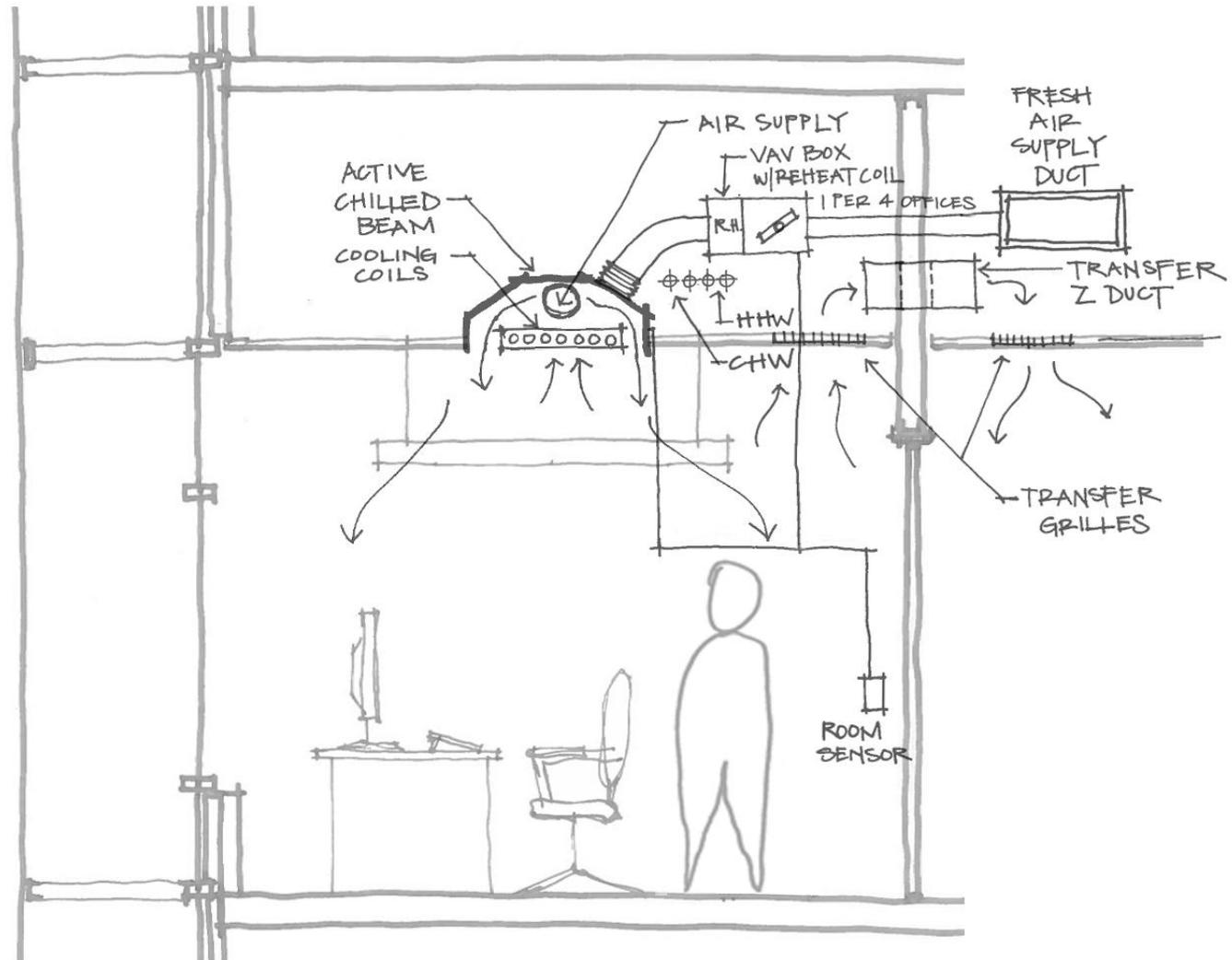
© Payette Associates

Concept Design – Mechanical System sketch



© Arup

Concept Design – Mechanical System Sketch



© Arup

Concept Design – Rendering



Interdisciplinary Activities

- Not all requirements come from the owner
- Not all requirements can be put into words
- Interdisciplinary conflict supports the design.

Requirements conflicts

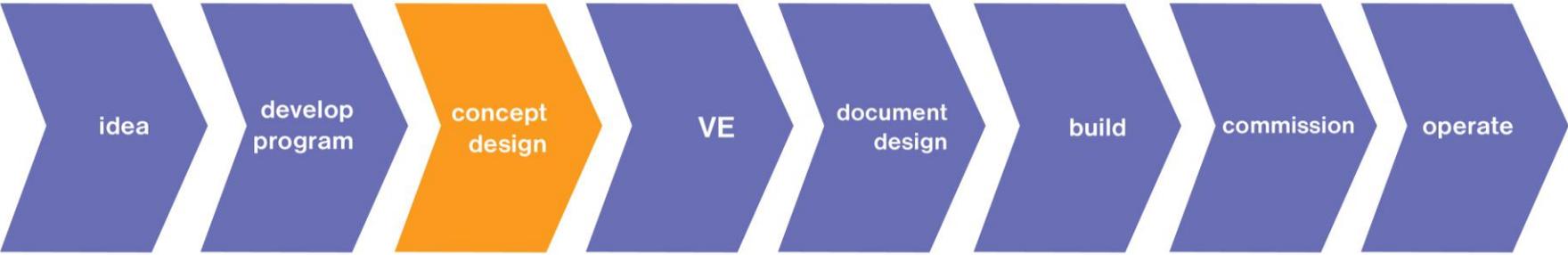
© CAREservice/Torino



Requirements conflicts



Concept Design



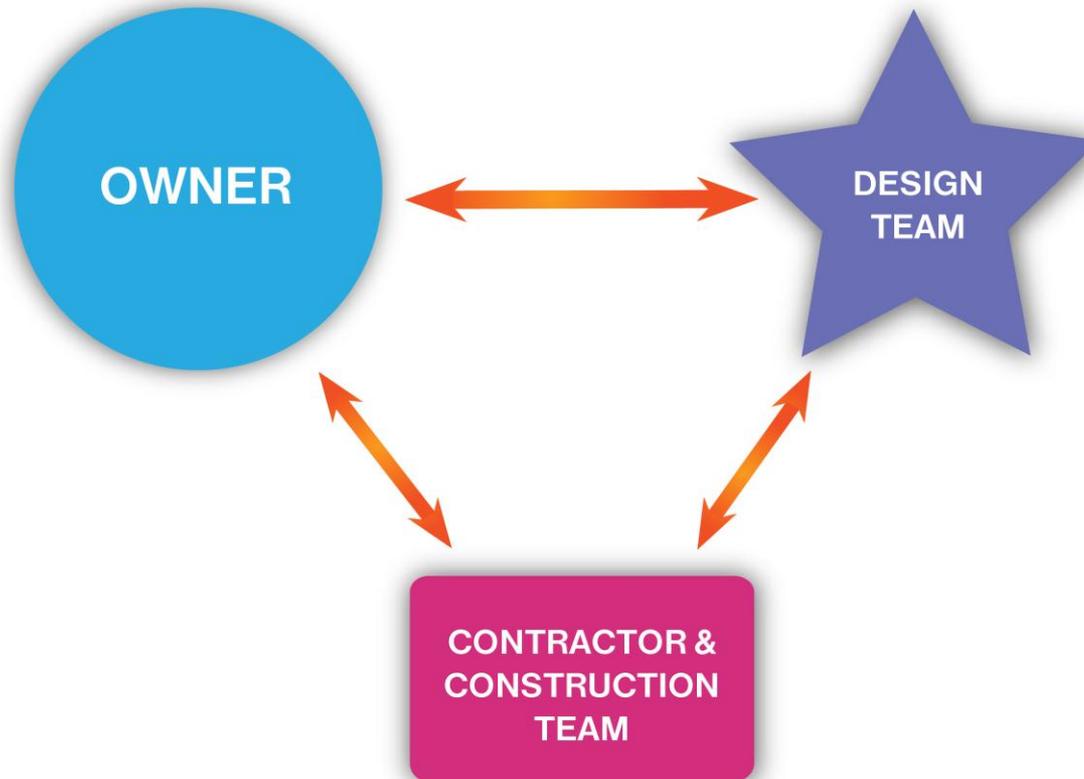
“Requirements engineering (RE) encompasses all the **interdisciplinary** activities involved in **determining, documenting** and **maintaining** an agreed set of requirements for a system, and for **tracing** these through to implementation. A specific concern is the development of practical techniques, methods, and tools to support these activities.”

Value Engineering... Vision

© Noah Sheldon



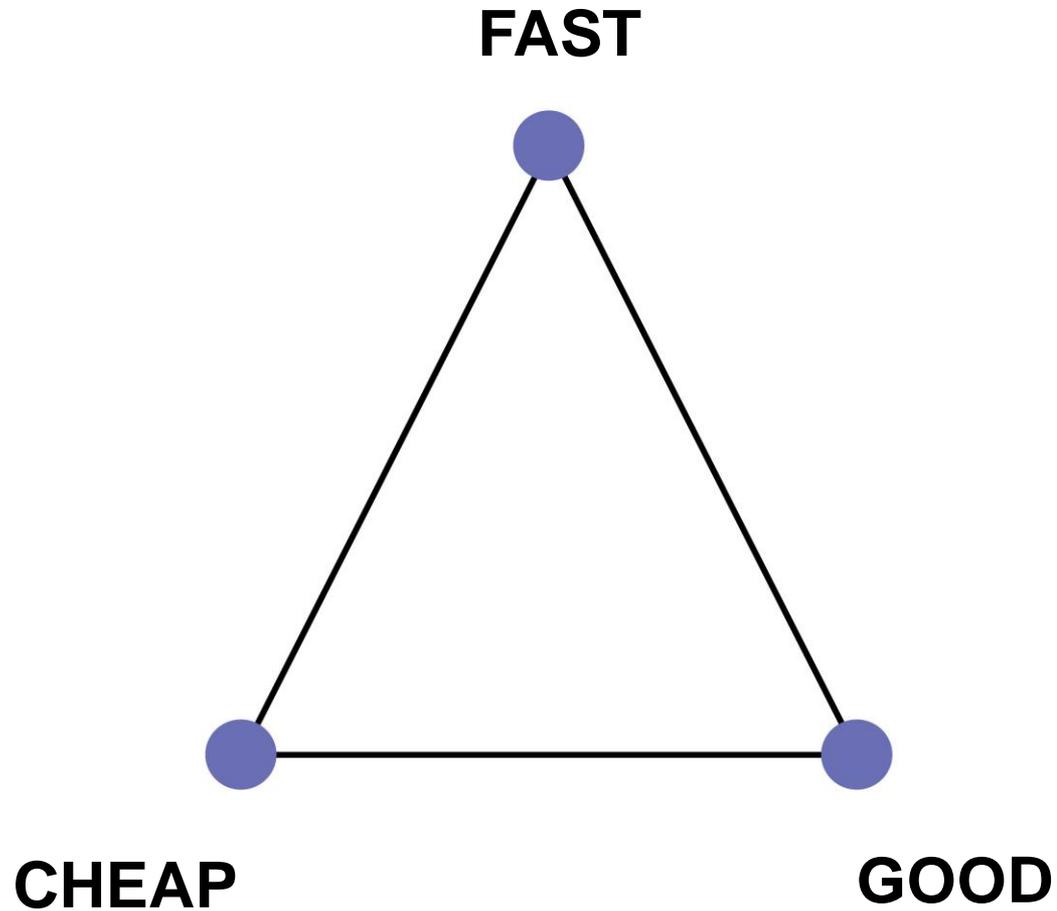
Value Engineering – Information Flow

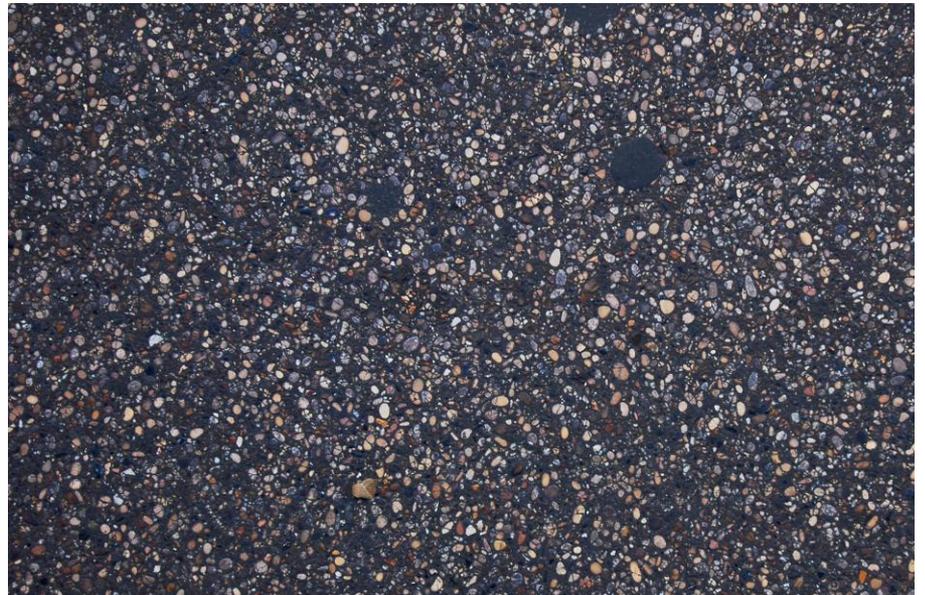


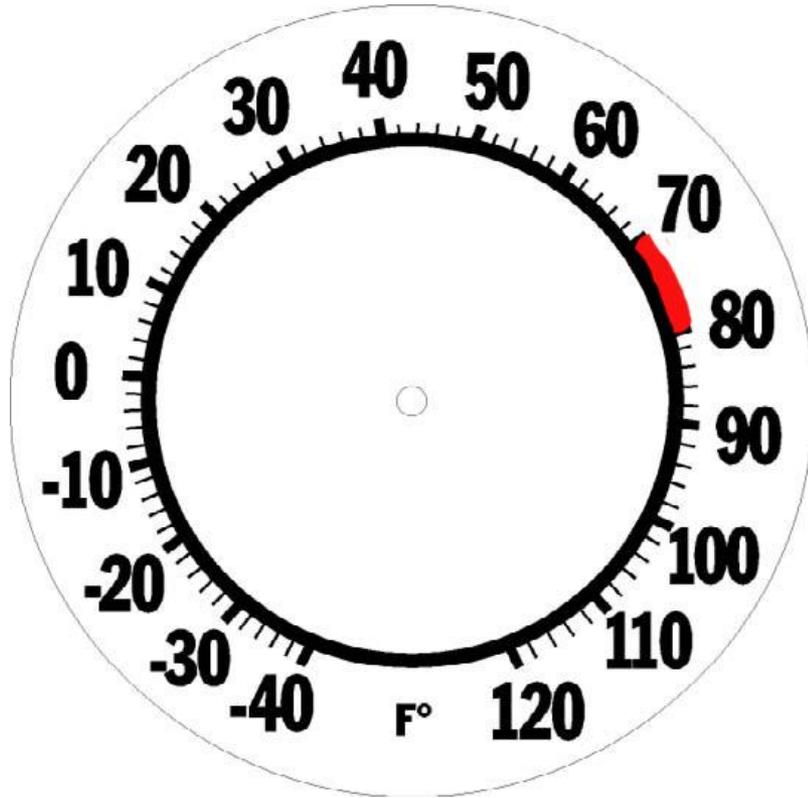
Value Engineering... Reality



Getting back to budget





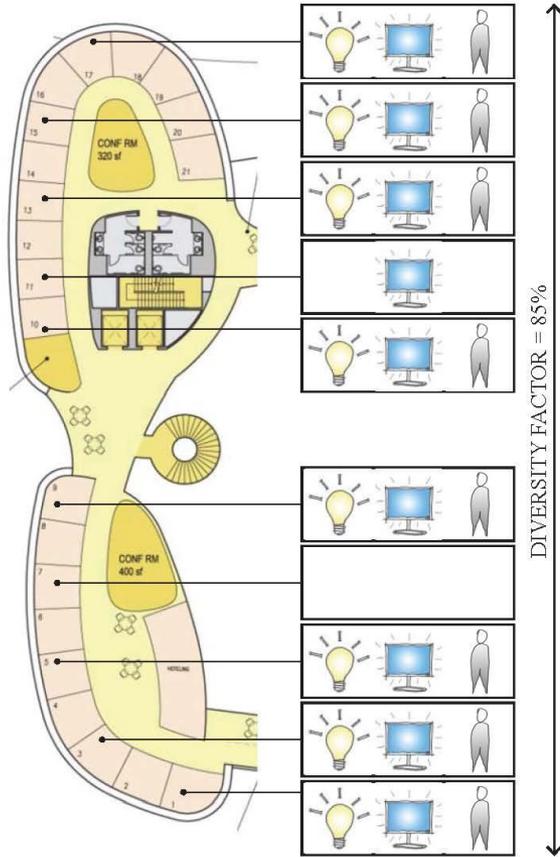
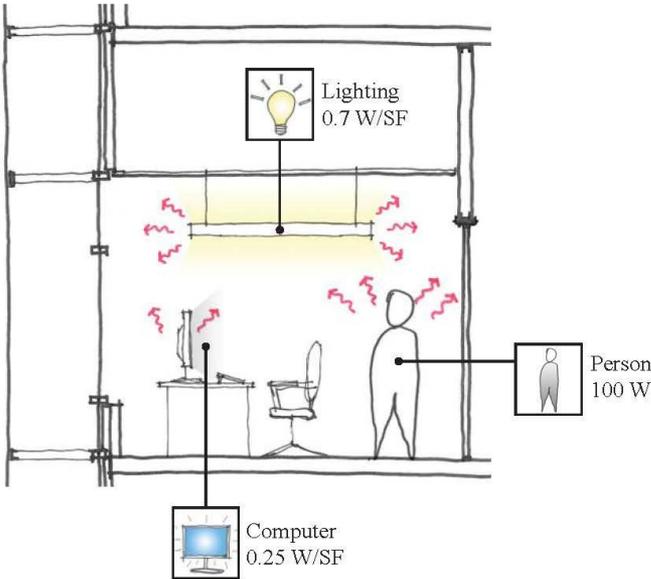


70F/21C Winter
74F/24C Summer

Diversity

TYPICAL OFFICE AREA

OFFICE LOADS = 1.5 W/SF



Making trade-offs



Making trade-offs

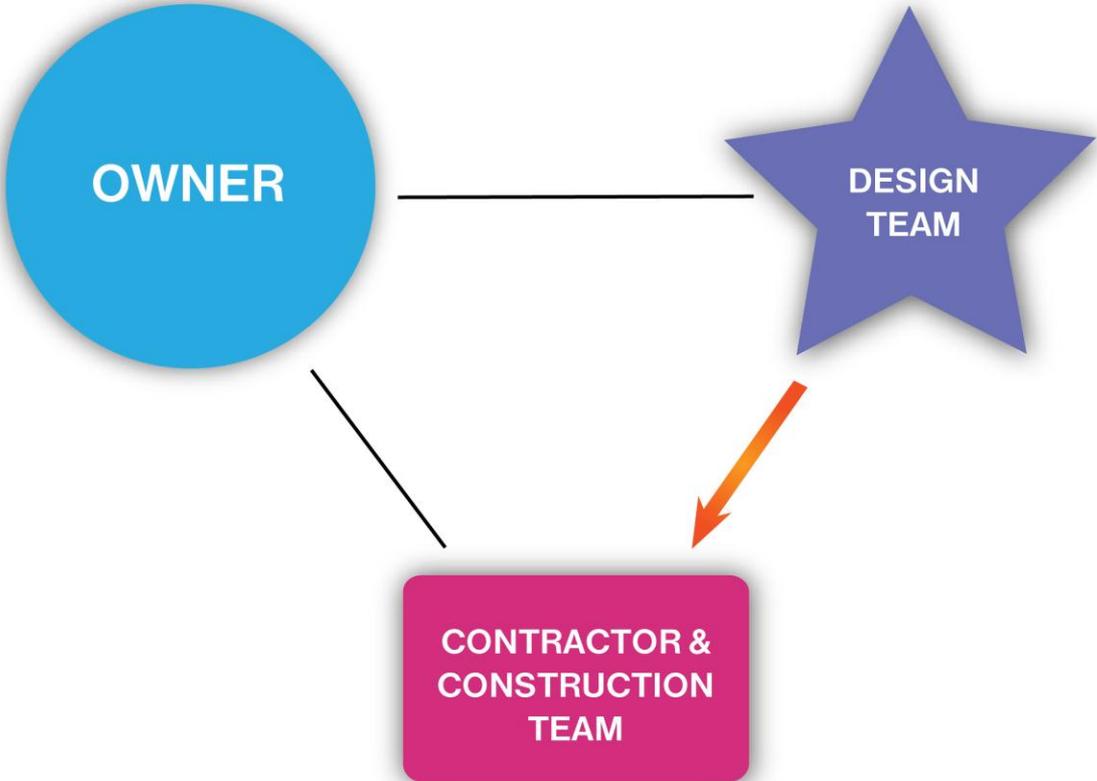


Project Progress

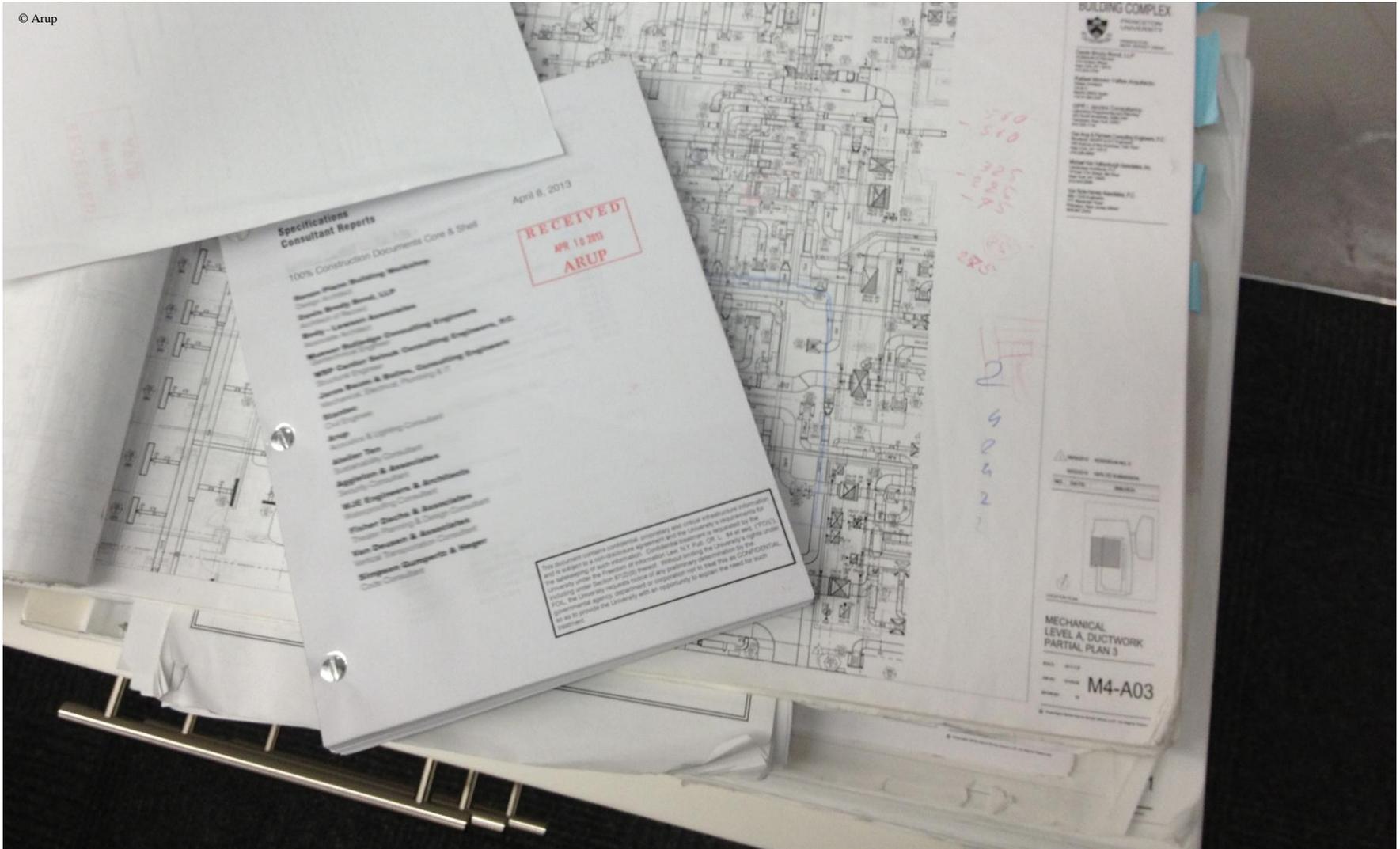


“Requirements engineering (RE) encompasses all the **interdisciplinary** activities involved in **determining, documenting** and **maintaining** an agreed set of requirements for a system, and for **tracing** these through to implementation. A specific concern is the development of practical techniques, methods, and tools to support these activities.”

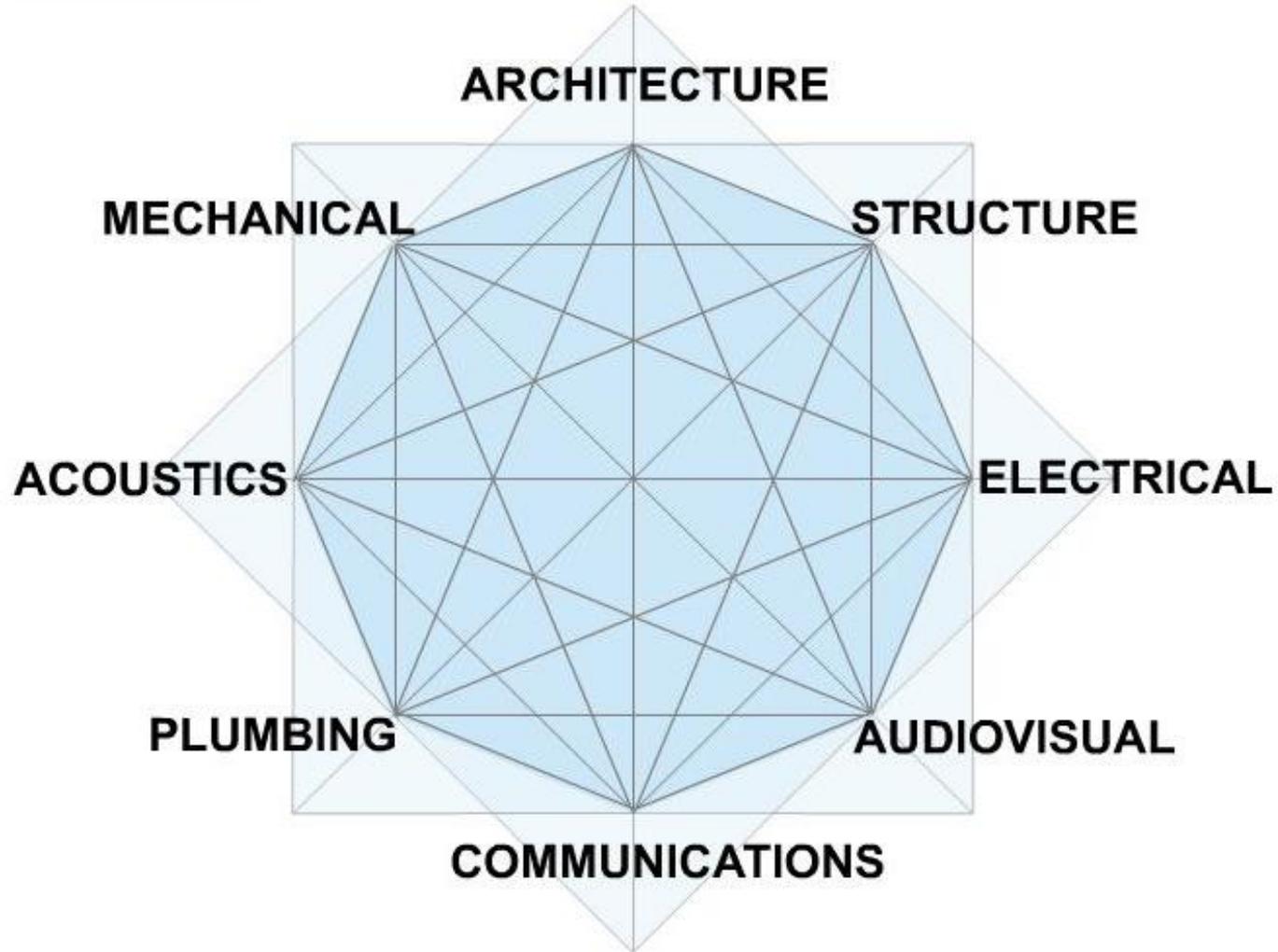
Information transfer



Construction Documents



Interdisciplinary coordination



© Erin McConahey

Documentation goals

- A bid at the expected price
- Tight enough to maintain quality, loose enough to allow competitive pricing
- Documents are not ambiguous or in conflict with each other

Specifications

CIVIL WORKS MASTER SPECIFICATION FOR CONSTRUCTION OF PROVINCIAL WATER MANAGEMENT PROJECTS

1. INTRODUCTION

- .1 Civil Works Master Specification (CWMS) is part of Alberta Transportation (TRANS) Master Specifications and Standards documents. The structure is based on the Construction Specifications Canada (CSC) and Construction Specifications Institute (CSI) publication "MasterFormat."
- .2 CWMS is the standard specification to be used by consulting engineers when developing TRANS contracts for the construction of medium to large water management projects that are owned by the Province. The construction contracts are between Alberta Transportation and contractors.
- .3 Although use of CWMS is mandatory, the consultant remains fully responsible for the contract specifications. Appropriate use of CWMS requires personnel who are experienced in the design and construction of water management projects, and qualified to judge and edit its content and to ensure the specification is suitable for the contract requirements. The consultant should appoint one person to coordinate the interdisciplinary review and assembly of the specifications and drawings.
- .4 Provincial water management projects may involve dams, spillways, canals, control structures, erosion abatement works, and flood control dykes.

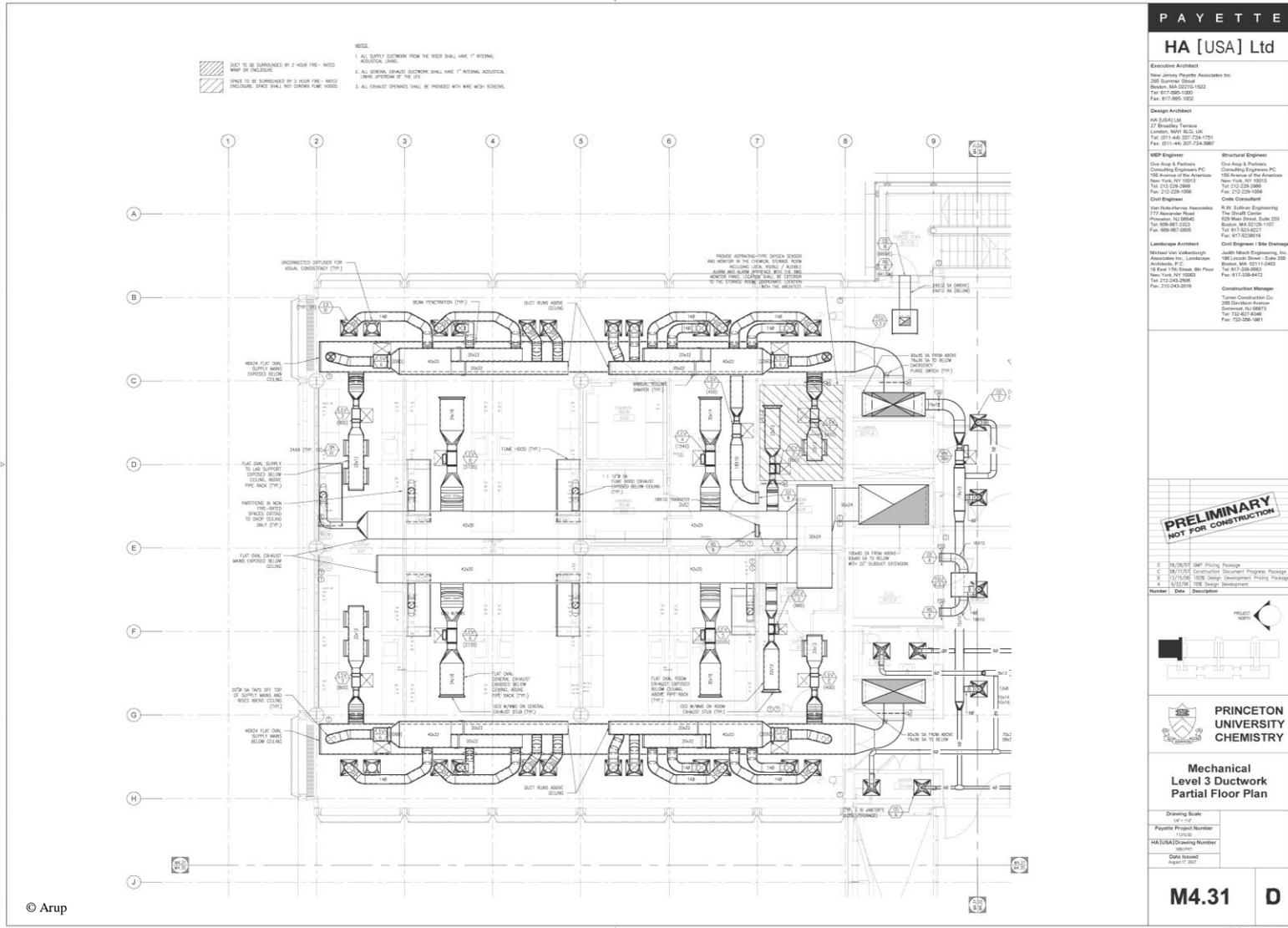
2. PURPOSE OF CWMS

- .1 CWMS was developed to:
 - .1 ensure consistency in the content and quality of contract specifications,
 - .2 establish TRANS's bidding, contracting, technical standards and contract administration procedures,
 - .3 provide TRANS's design consultants with a "production tool" for the preparation of contract specifications, reducing contract development and review time, and
 - .4 serves as part of TRANS's corporate memory on water management work .

Visualizations and mock ups



Drawings



PAYETTE

HA [USA] Ltd

Executive Architect
New Jersey Payette Associates Inc.
285 Boulevard
Bridgewater, NJ 08802
Tel: 973-685-1300
Fax: 973-685-1302

Design Architect
HA [USA] Ltd
27 Brinkley Terrace
London, W8Y 8LQ, UK
Tel: 011-44-207-724-1793
Fax: 011-44-207-724-3667

MEP Engineer
One King's Parkway
Consulting Engineers PC
185 Avenue of the Americas
New York, NY 10013
Tel: 212-238-3666
Fax: 212-238-3668
Civil Engineer
One King's Parkway
Consulting Engineers PC
185 Avenue of the Americas
New York, NY 10013
Tel: 212-238-3666
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Structural Engineer
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Consulting Engineers PC
185 Avenue of the Americas
New York, NY 10013
Tel: 212-238-3666
Fax: 212-238-3668
Civil Engineer
One King's Parkway
Consulting Engineers PC
185 Avenue of the Americas
New York, NY 10013
Tel: 212-238-3666
Fax: 212-238-3668

Use-Phase/Owner Associates
777 Alexander Road
Horseneck, NJ 08042
Tel: 609-687-2255
Fax: 609-687-0856

Construction Manager
Tanner Construction Co.
285 Delaware Avenue
Bridgewater, NJ 08807
Tel: 732-677-6346
Fax: 732-386-1881

**PRELIMINARY
NOT FOR CONSTRUCTION**

Number	Date	Description
0	09/29/07	DWP Picking Package
1	09/17/07	Construction Document Progress Package
2	10/17/07	0202 Design Development Picking Package
3	12/12/07	0202 Design Development Picking Package

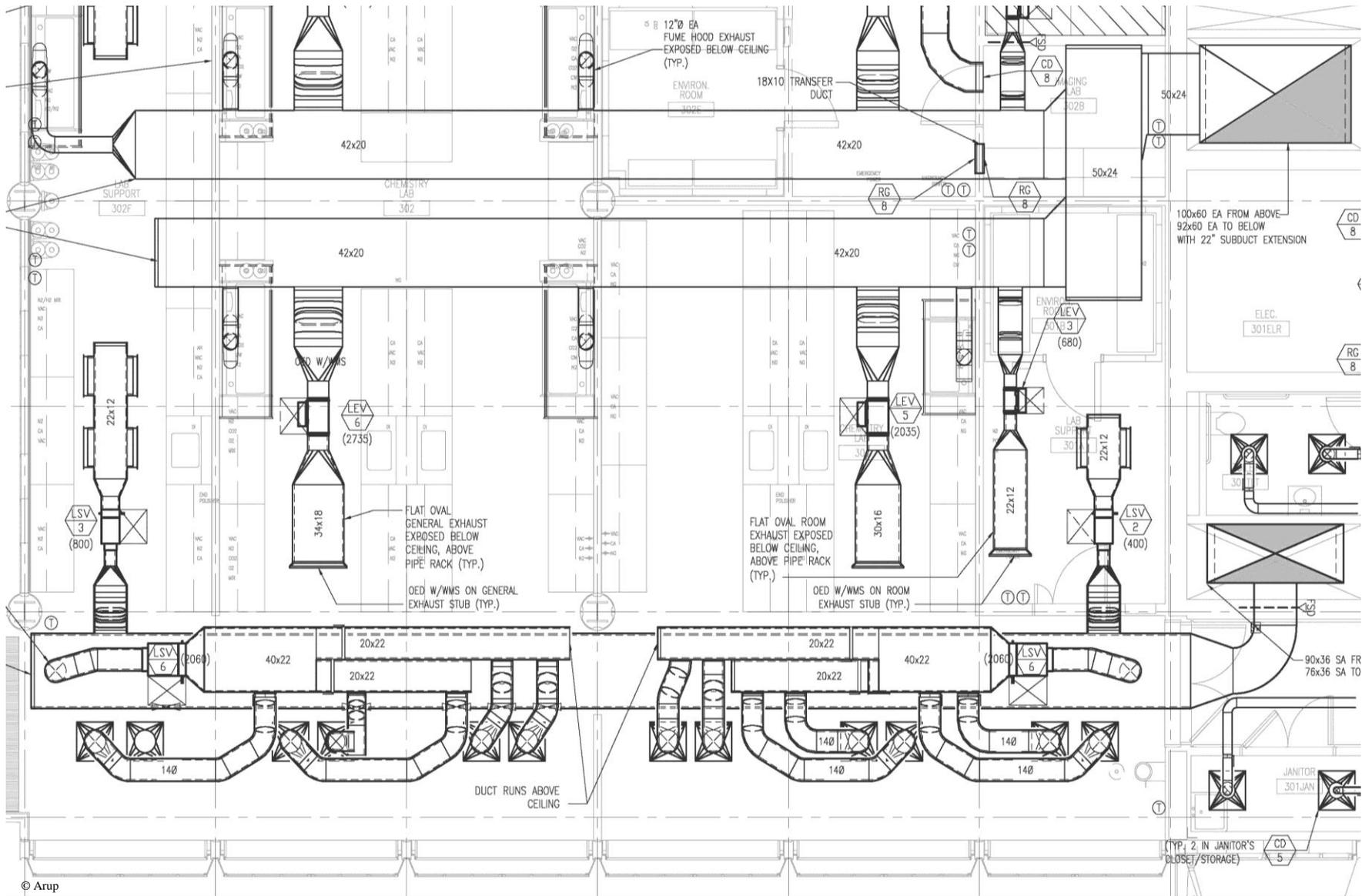


**Mechanical
Level 3 Ductwork
Partial Floor Plan**

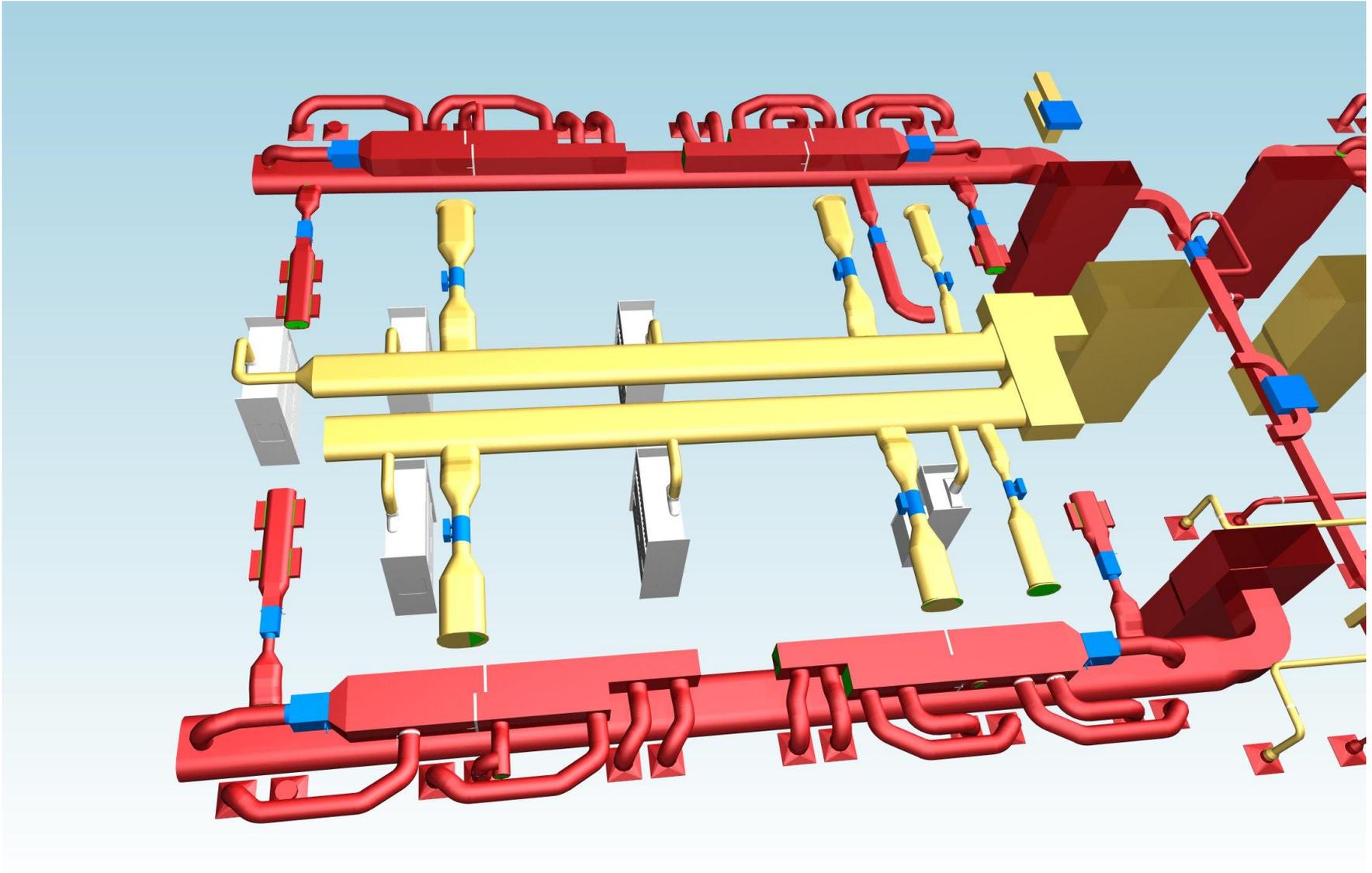
Drawing Scale	1/4" = 1'-0"
Payette Project Number	105338
HA [USA] Drawing Number	MEP-001
Date Issued	08/11/07

M4.31 D

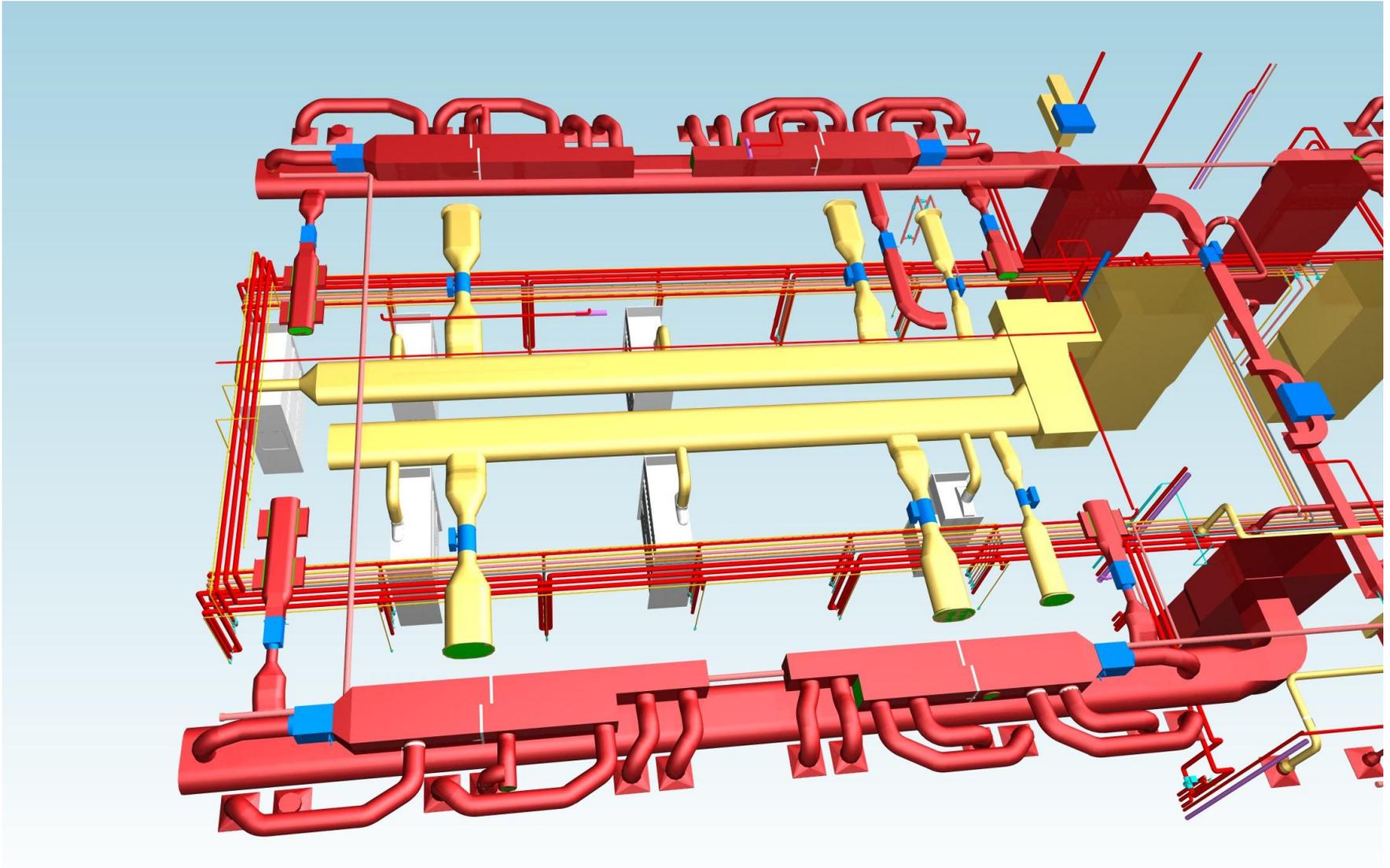
©2006 Payette Associates Inc.



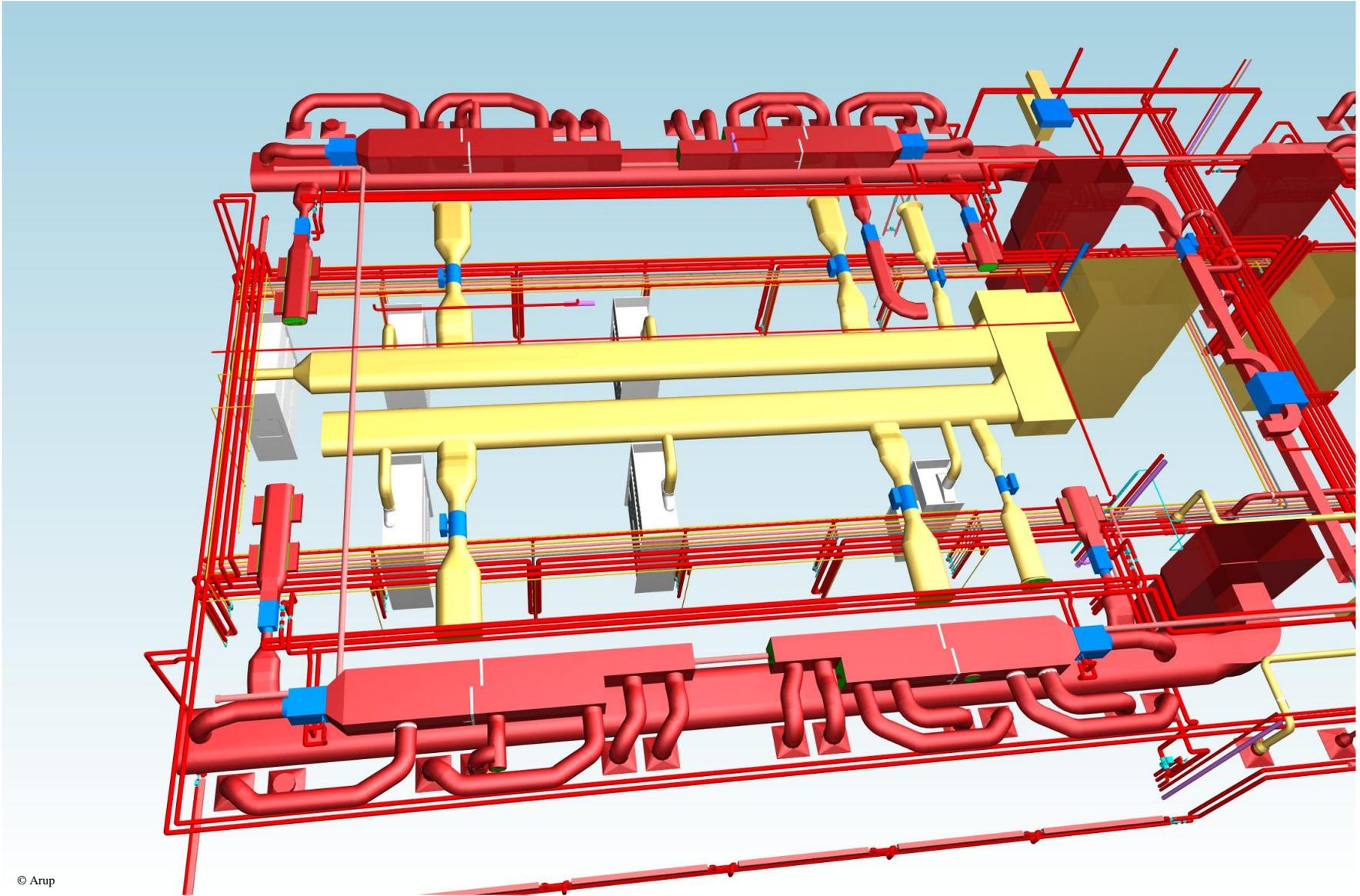
© Arup



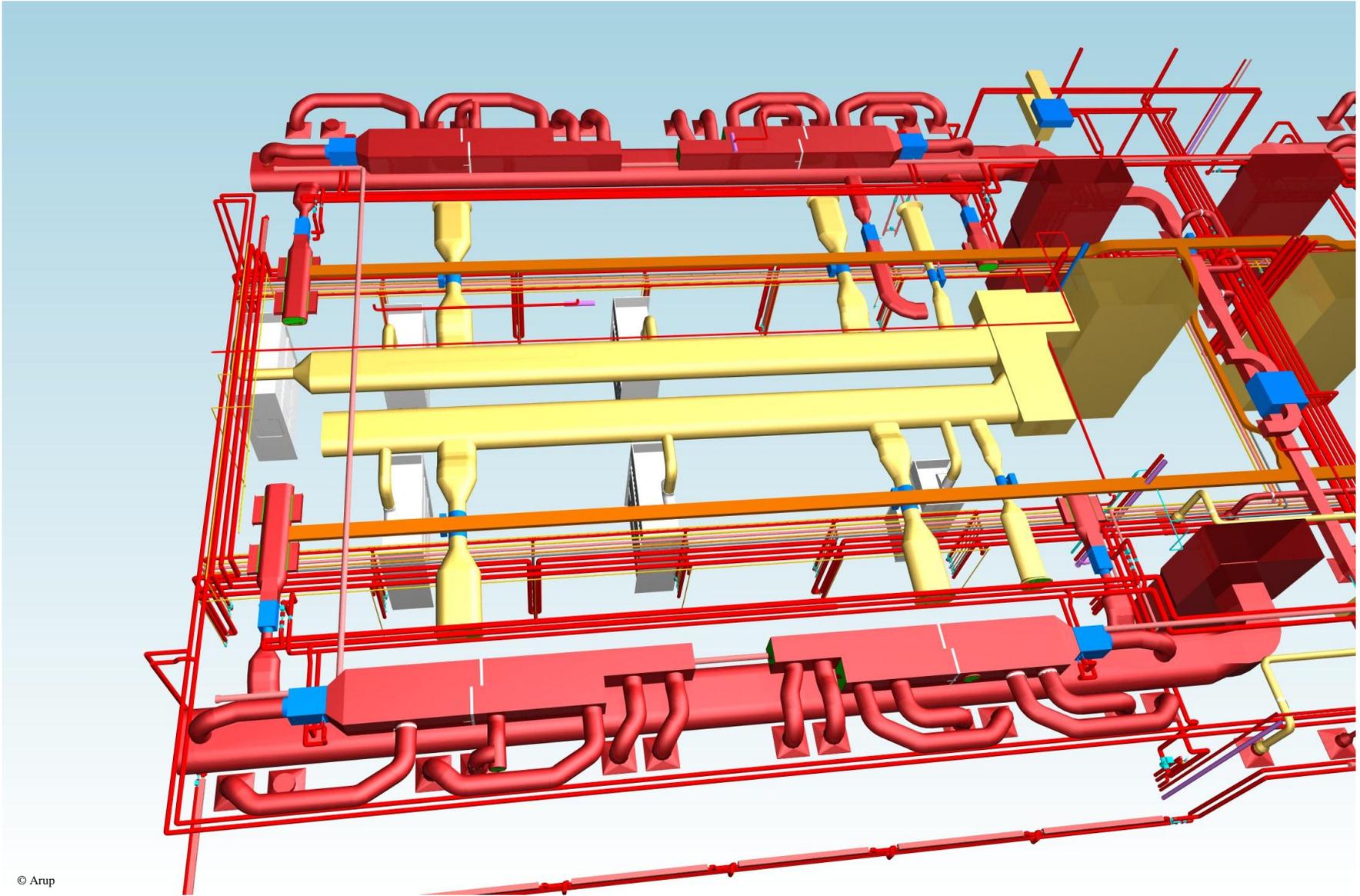
© Arup



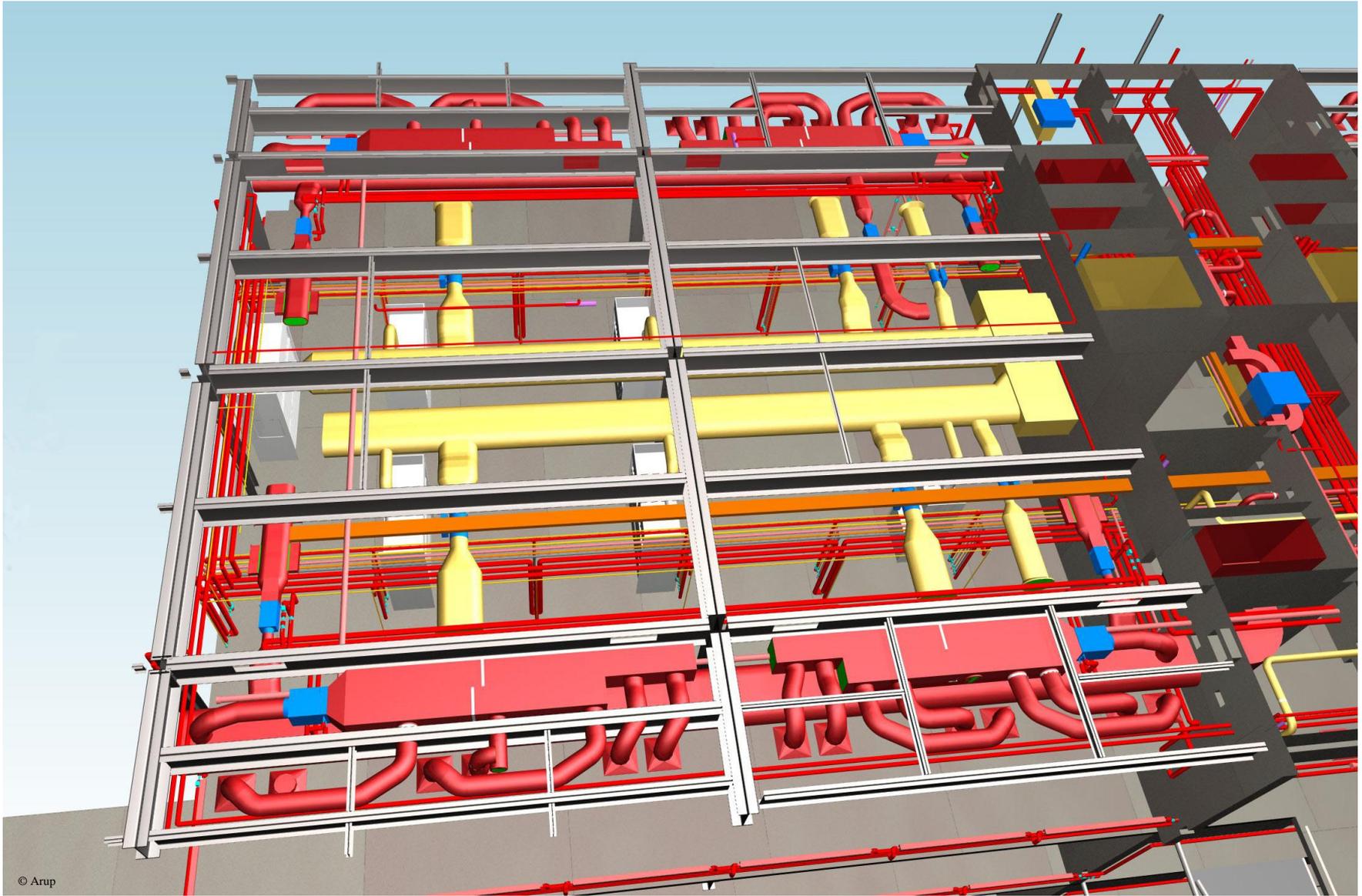
© Arup



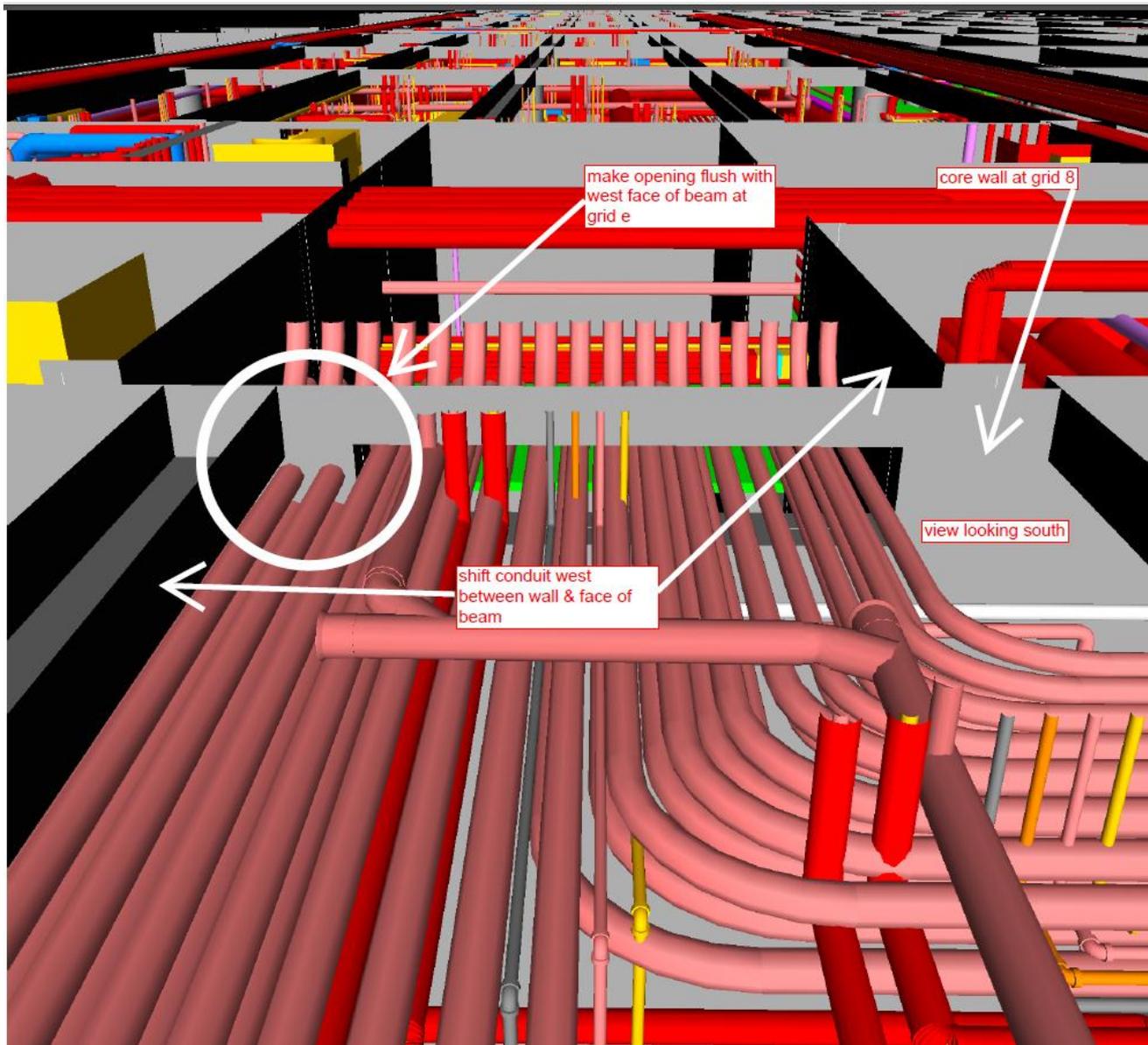
© Arup



© Arup



© Arup



© Arup

The screenshot displays the Autodesk Revit software interface. The title bar indicates the current view is 'Floor Plan: M-Level-01'. The ribbon at the top contains toolsets for Systems, Architecture, Insert, Annotate, Analyze, Massing & Site, Collaborate, View, Manage, Add-Ins, Tools4Revit, T4R: Smart MEP, T4R: Document, Extensions, CADtools, Case Design Inc., Modify, and a search bar. The ribbon is currently set to 'MEP', with sub-panels for Modelling, Views, ExcelLink, Family, Project, and Labs. The project browser on the left shows a hierarchical tree of views, with 'Floor Plan: M-Level-01' selected. The central view shows a detailed mechanical floor plan with a grid, red piping, and various mechanical components. The properties panel on the right shows settings for the 'Floor Plan: M-Level-01' view, including graphics, visibility, and identity data. The status bar at the bottom indicates the current workset is 'Workset1 (Not Editable)' and the main model is selected.

Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

Workset1 (Not Editable) Main Model Exclude Options Editable Only Press & Drag

Documentation

- Documentation uses standard formats and model language
- Goal is to provide both clarity and opportunity for savings
- Checking is key

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Project Progress



Whose requirements?



Whose requirements?

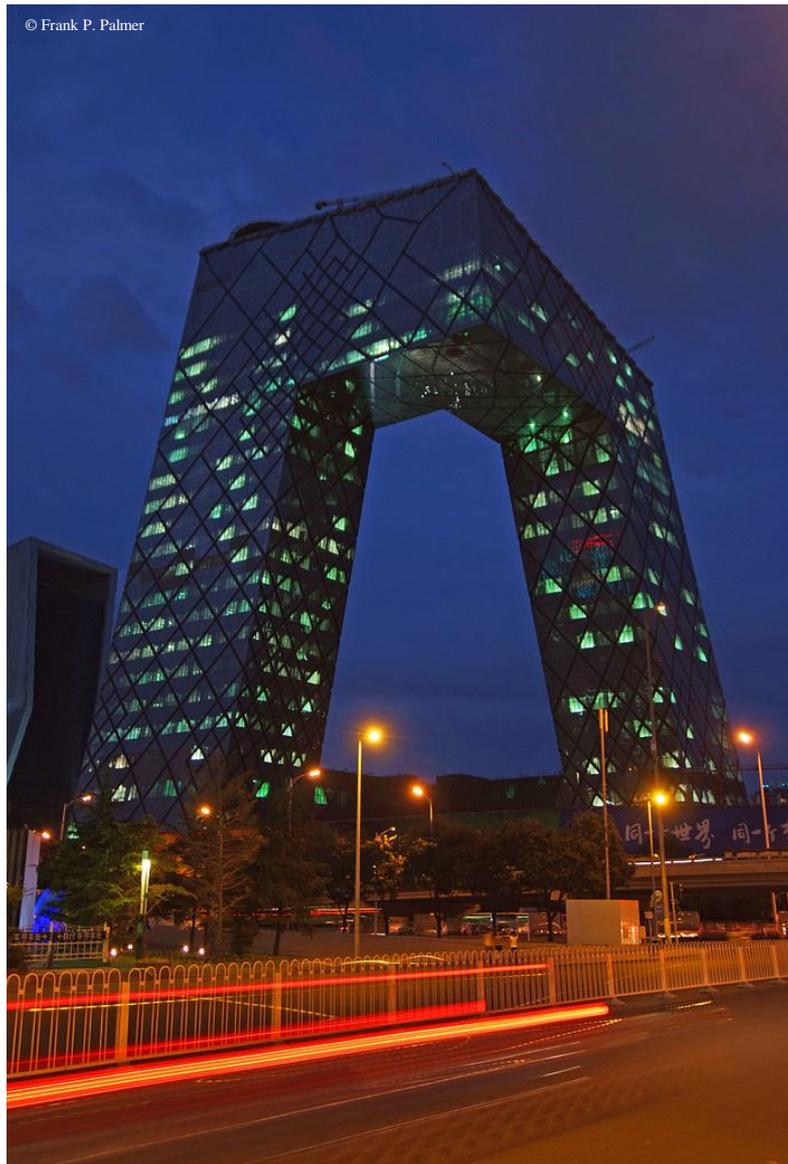








© Frank P. Palmer

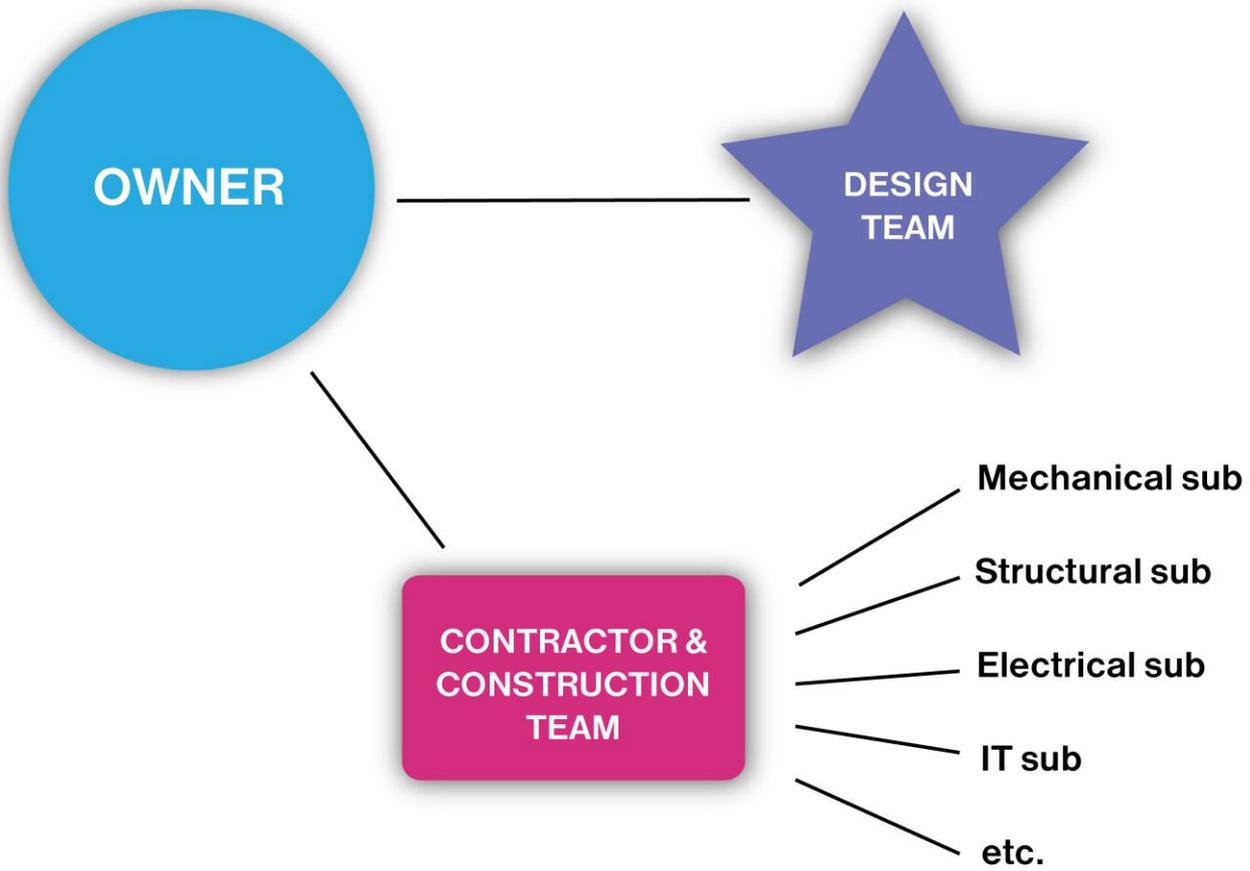


© Fiona Cousins





Moving into Construction



Project Progress



“Requirements engineering (RE) encompasses all the **interdisciplinary** activities involved in **determining, documenting and maintaining** an agreed set of requirements for a system, and for **tracing** these through to implementation. A specific concern is the development of practical techniques, methods, and tools to support these activities.”

What we wanted

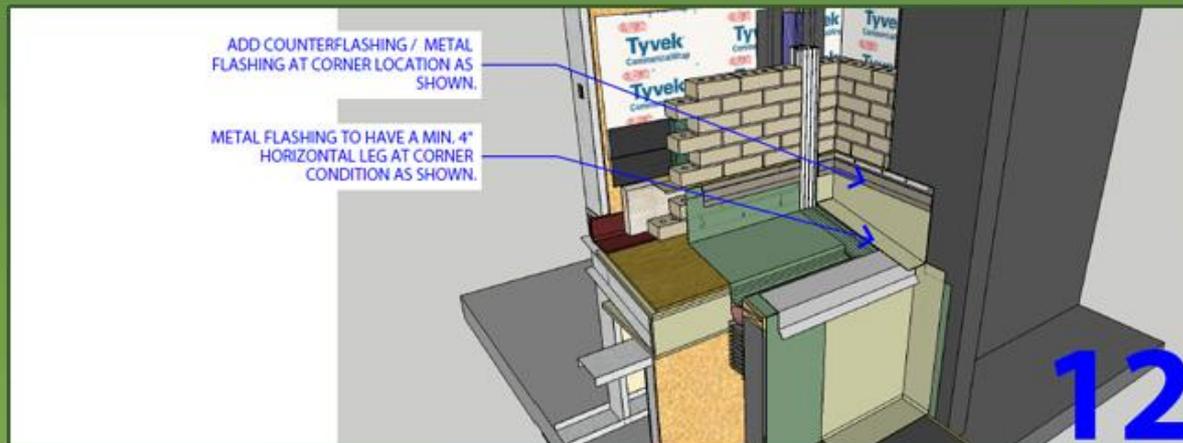
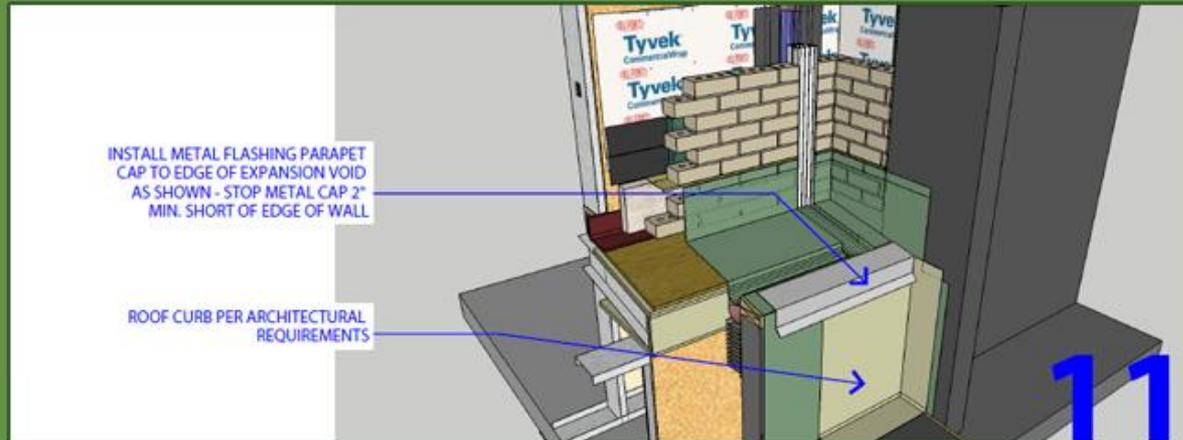


JetBlue Terminal 5i
 Submittal Report
 1 July 2013

Submittal Number	Title	Discipline	Status	Returned On	Received On	Working Days in Office
2636-0001-263600-0	Automatic Transfer Switch	Electrical	open		20 Jun 2013	7
2632-0001-263213-0	Generator	Electrical	open		26 Jun 2013	3
2628-0002-262813-0	Enclosed Circuit Breakers	Electrical	open		25 Jun 2013	4
2624-0002-262413-0	Distribution Switchboard	Electrical	open		26 Jun 2013	3
2624-0001-262416-0	Panelboards, Circuit Breakers	Electrical	open		26 Jun 2013	3
2605-0025-260500-0	Upper Concourse Level Zone B Sleeve Layout	Electrical	open		27 Jun 2013	2
2605-0024-260500-0	Departure Sleeves EJD5.03C.SLV	Electrical	open		21 Jun 2013	6
2605-0021-260500-0	Backbone Feeder Conduit Distribution Layout Zone-C	Electrical	open		26 Jun 2013	3
2605-0015-260500-1	Under slab Level Zone B - Conduit Layout Plan	Electrical	open		27 Jun 2013	2
2382-0002-238239-1	Cabinet Heaters	Mechanical	open		21 Jun 2013	6
2381-0001-238123-1	Computer Room Air Conditioners CRAC 1-3	Mechanical	open		21 Jun 2013	6
2373-0007-237413-0	Sesimic and Wind Analysis	Mechanical	open		01 Jul 2013	0
2373-0006-237413-0	AH Factory Test Procedures	Mechanical	open		21 Jun 2013	6
2373-0001-237413-2	Roof Top AHU	Mechanical	open		11 Jun 2013	14
2334-0001-233416-1	Exhaust Fans, Transfer Fans and ALW Fans	Mechanical	open		27 Jun 2013	2
2333-0002-233300-2	Louver Penthouse	Mechanical	open		27 Jun 2013	2
2331-0013-233113-0	Departure Zone A and B Slab Openings	Mechanical	open		01 Jul 2013	0
2331-0012-233113-0	Mezzanine A4-1	Mechanical	open		28 Jun 2013	1
2331-0011-233113-0	HVAC Ductwork Departure Zone C Slab Openings	Mechanical	open		20 Jun 2013	7
2331-0006-233113-0	HVAC Ductwork Arrival Zone A	Mechanical	open		11 Jun 2013	14
2305-0009-230500-0	Sleeves in Fixed Bridges	Mechanical	open		20 Jun 2013	7
2305-0008-230500-0	HVAC Piping Chill Water and Heating Glycol Riser	Mechanical	open		20 Jun 2013	7
2240-0003-224000-0	Plumbing Fixtures P1-B and P-11	Plumbing	open		20 Jun 2013	7
2211-0005-221119-0	Vacuum Breakers	Plumbing	open		20 Jun 2013	7
2211-0004-221116-1	Above Ground Copper	Plumbing	open		20 Jun 2013	7
2207-0001-220700-0	Knauf Pipe Insulation	Plumbing	open		27 Jun 2013	2
2205-0023-220500-0	Upper Concourse Piping Area C	Plumbing	open		27 Jun 2013	2
2205-0022-220500-0	Upper Concourse Zone B	Plumbing	open		20 Jun 2013	7
2205-0021-220500-0	Upper Concourse Zone A	Plumbing	open		20 Jun 2013	7
2105-0007-210500-0	Spooler Heads	Fire	open		01 Jul 2013	0

Where it's going

A Collaborative Solution between Design and Construction Teams



What we wanted, where we want it



TAA-Y8400-05

**Level 2 Area BD Bathrooms CBN-2082 & CBN-2083 - Above Ceiling
In Progress**

- Hide Closed Items
 Turn Images On

[▶ Run](#) [Reset](#)

Row No	Room Number	Room Name	Item Description	Contractor	Date Opened	Opened By	Status	Attachments	Date Closed	Closed By	Contractor Comments/ Engineer's Response	-
E-002	CBN-2083	Women's toilet	Junction box missing cover.	Unity	2/28/2013	Nancy Camacho	Deficiency				CC: --/--/-- ER: --/--/--	Edit Delete Close CC/ER
M-001	CBN-2082/2083	Toilets	Fix duct insulation.	United	12/7/2012	Andrew Heiser	Deficiency				CC: 2/22/2013 Item Complete ER: --/--/--	Edit Delete Close CC/ER
T-001	CBN-2082	Men's Toilet	DAS Incomplete.	Unity	12/7/2012	Marta Lee	Non-Conformance Contract				CC: --/--/-- ER: --/--/--	Edit Delete Close CC/ER
E-001	CBN-2082	Men's toilet	No lighting ballasts installed.	Unity	12/7/2012	Nancy Camacho	Deficiency		2/28/2013	Nancy Camacho	CC: 2/6/2013 completed ER: --/--/--	Edit Delete Close CC/ER
F-001	CBN-2082/2083	Toilets	Maximum unsupported sprinkler head branch shall not exceed 12".	Sirina	12/7/2012	Reynaldo Espiritu	Deficiency		5/14/2013	Andrew Heiser	CC: 2/4/2013 Completed ER: --/--/--	Edit Delete Close CC/ER

Different goals



Managing Change

Create new Request for Information - Windows Internet Explorer provided by Arup Usa

ARUP AMERICAS JetBlue Terminal 5i
Add new unanswered RFI

This form is to be used to enter new open RFIs into the system. Once entered, the system can be used to track the status of the RFI and, if necessary, collect responses from the appropriate individuals before a final response is made. If the RFI that you are entering has already been answered and you are entering it in order to log into the system, click [here](#) to use the log-completed RFI form.

load RFI file as received (incoming):

RFI number: Received by:

subject:

facilitator: no default option [change](#)
 The facilitator is the person who currently has responsibility for answering this RFI or seeing that it is forwarded to the right person for response.

dates:
 Due on: [see valid formats](#)
 Received on: [see valid formats](#)

The information requested below is being collected to help tracking and reporting of RFIs for the project. It is optional for the more you enter, the better the reporting and tracking functions for this log will be. Information can be added at a later date by choosing the edit RFI option.

Requested on: [see valid formats](#)
 Originated on: [see valid formats](#)

category:
 True Request for Information
 Contractor Coordination
 Contractor Means and Methods
 Contractor Re-Work / Non-Compliant Work Proposal
 Document Clarification
 Duplicate or Redundant RFI
 Incomplete or Unclear Request
 Information in Contract Documents
 Outside of Arup Scope
 Request for Substitution / Alternate Design Proposal
 RFI in lieu of Submittal
 Unforeseen Condition
 Category Unknown

discipline:
 select a discipline

specification section:
 [enter or select from list of specs](#)

info requested:

drawings referenced:

returned to:

[load defaults](#)
[clear contact information](#)

Genier - NY [change Company](#)
 1200 Avenue of Americas Suite 1000 [change Address](#)
 New York, NY 10020

attention: Ty Osaugh [change Contact](#)

question origins:
 of [select from contacts](#)

RECEIVED
Jul 03, 2013
ARUP

RFI

jetBlue Terminal 5i Expansion
 Project # 12061
 Van Wyck Expressway
 Jamaica, NY 11430 Telephone: _____ Fax: _____ July 03, 2013

RFI #: 0407	Date Created: 7/3/2013	Date Required: 7/10/2013
-------------	------------------------	--------------------------

TO:	FROM:
Ty Osaugh Genier 1200 Avenue of the Americas Suite 1500 New York, NY 10020 Phone: 1.212.484.2440	Latoya Stephens Turner Construction Co. 375 Hudson Street 6TH FLOOR New York, NY 10014 Phone: 646-656-6736

Subject	Discipline	Category
Product Specification for VFD's	Mechanical	Specification Clarification

Drawing References: Spec Section References:
 Disa.No. Rev.No. Revision Date Title Sketch References:

Question:
 On drawing The specification Z06900 and T4M05.04 detail 5 through 8 requires each exhaust fan to have a motor starter or VFD. Please provide the product specification for VFD's and motor starters to match what is already required for the control drawings.

Suggestion:

Answer:
 Date Answered:

Signature: Date:

Cc	Company Name	Contact Name	Copies	Fax Number	Notes
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T000 - RFI Individual Printout_V4.rtf
 RFI Received_211200131
 Turner Construction Co.
 Page 1 of 1

8.50 x 11.00 in 4 67%

A single source of truth

The screenshot displays a web application interface for the 'Andlinger Center for Energy and Environment'. The main content area shows a 'Tech Team Review Log' table with 250 entries. The table columns are: Index, Subject, Originator, Responsible Users, Status, % Complete, Submitted, and Closed. The table is filtered to show all entries, and the maximum number of items to display is set to 250. The table data is as follows:

Index	Subject	Originator	Responsible Users	Status	% Complete	Submitted	Closed
455	Submittal 1233: 15901-003-R1 Flow Meters	Elliott Croll	Art Murphy	Closed	100	Jun 10, 2013	Jun 27, 2013
454	Submittal 1228: 16132-006-R1 Event Power Box	Elliott Croll	Jim Kane	In Process	0	Jun 10, 2013	
453	Submittal 1227: 16431-001-R1 Metering & Switchboard Instruments	Elliott Croll	Jim Kane	In Process	0	Jun 10, 2013	
452	Submittal 1229: 15182-003-R1 Pressure Reducing Valves	Elliott Croll	Scott Sepsy	Closed	100	Jun 10, 2013	Jun 25, 2013
451	Submittal 1230: 15224-002-R2 Reverse Osmosis for Clean Steam Generator	Elliott Croll	Scott Sepsy	Closed	100	Jun 10, 2013	Jun 18, 2013
450	09300-006-R0 Schluter Systems Floor, Wall, & Counter Profile	Steve Hancock	Anthony L Pezzicola	Closed	100	Jun 3, 2013	Jun 5, 2013
449	08710-002-R0 Door Hardware Schedule & Product Data	Steve Hancock	David Olsen	Void	0	May 17, 2013	
448	02350-050-R0 Continuous Deflective Separator	Steve Hancock	Sean Gallagher	Closed	100	May 15, 2013	Jun 18, 2013
447	Submittal 1180: 15052-023-R0 Coordinated Plumbing Shop Dwg - A2 Lvl 005	Elliott Croll	Cynthia B. Keith	Closed	100	May 13, 2013	May 21, 2013
446	Submittal 1179: 15052-022-R0 Coordinated Plumbing Shop Dwg - A2 Lvl 004	Elliott Croll	Cynthia B. Keith	Closed	100	May 13, 2013	May 21, 2013
445	Submittal 1177: 15053-019-R1 Coordinated HVAC Sheet Mtl Shp Dwg - A2 Lvl 004	Elliott Croll	Scott Sepsy	Closed	100	May 13, 2013	May 21, 2013
444	Submittal 1175: 15053-017-R1 Coordinated HVAC Sheet Mtl Shp Dwg - A2 Lvl 001	Elliott Croll	Scott Sepsy	Closed	100	May 13, 2013	May 21, 2013
443	Submittal 1178: 15052-021-R0 Coordinated Plumbing Shp Dwg - A2 Lvl 002	Elliott Croll	Cynthia B. Keith	Closed	100	May 13, 2013	May 21, 2013
442	Submittal 1176: 15053-018-R1 Coordinated HVAC Sheet Mtl Shp Dwg - A2 Lvl 002	Elliott Croll	Scott Sepsy	Closed	100	May 13, 2013	May 21, 2013
441	Submittal 1163: 15053-021-R0 Coordinated HVAC Mechanical	Elliott Croll	Scott Sepsy	Closed	100	May 13, 2013	May 21, 2013

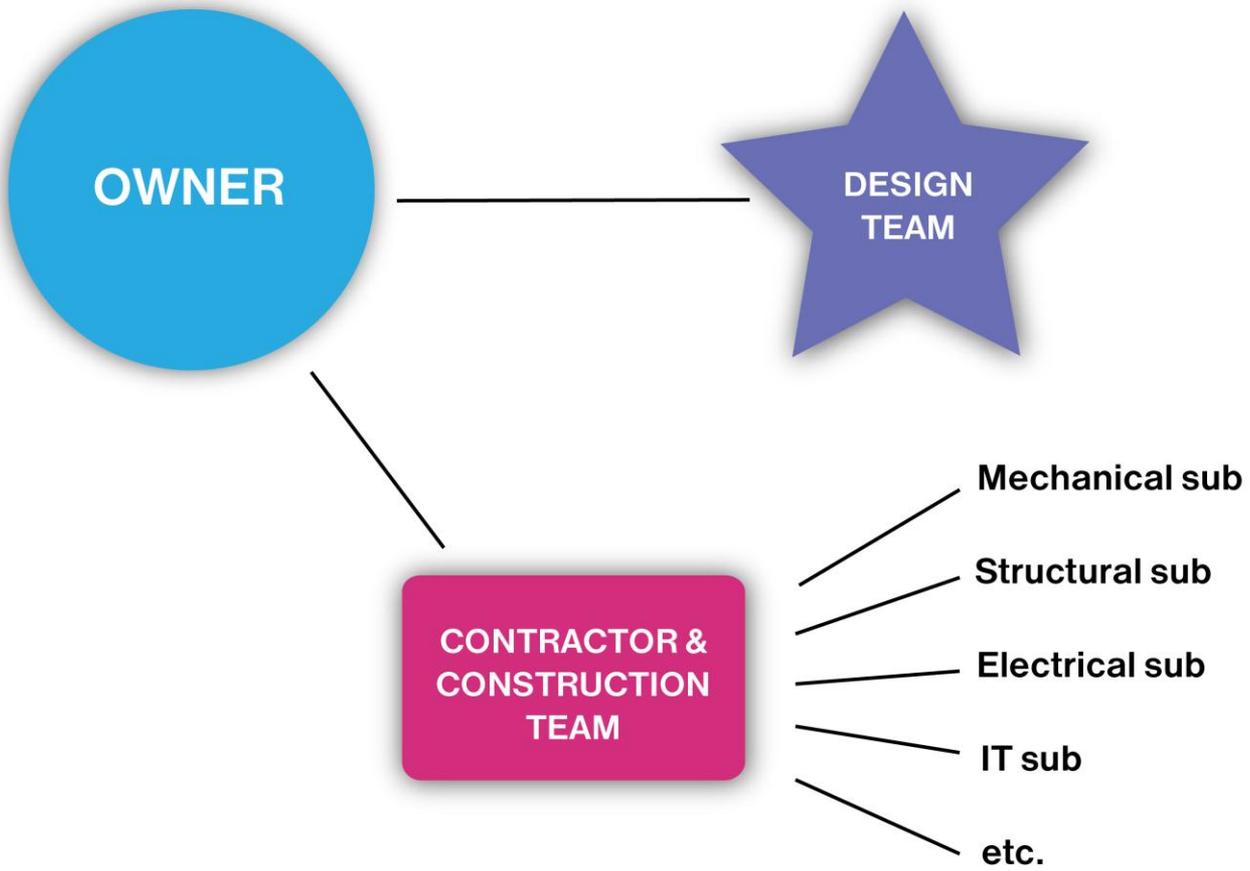
Construction

- Regimented
- Process driven
- Cooperation is not the natural state

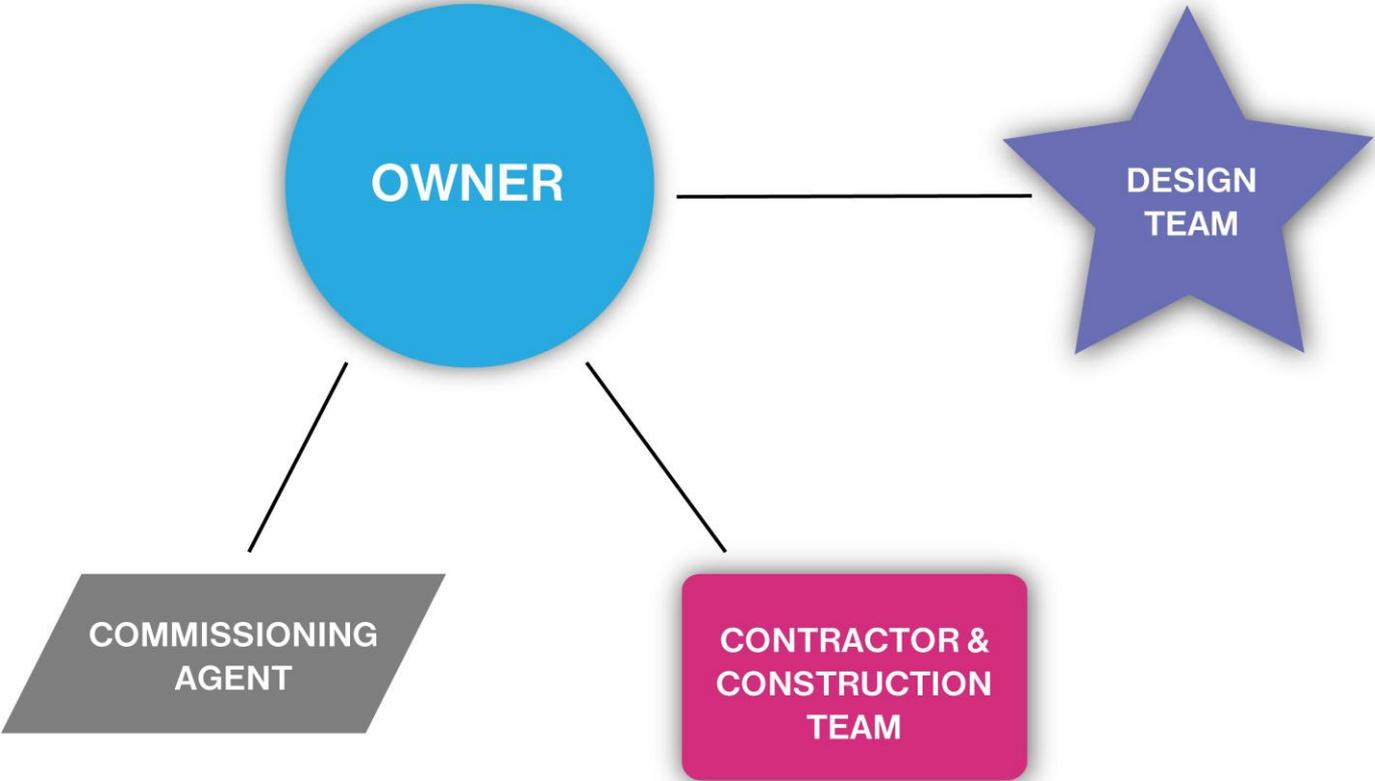
What does the owner see here?



Moving into Construction



Handing over



Logged in as: Andrew.Heiser - [My Settings] [Log Out]
 Current role: SURVEY You have 460 new messages.

e-Facilities Activation Support Tools

T4 HEADHOUSE AND CONCOURSE B

[New Releases](#) | [Feedback](#) | [Help](#)



Site: TAA-Y8400-05

Gen:

[Dashboard](#) | [Report](#)

Site : TAA-Y8400-05 Survey List

Gen	Name	Lead Inspector	Area Status	Obv	Open Def	Closed Def	Open NCR	Closed NCR	% Resp
Rec	ted Within Past Week								

► **Building Automated Systems** 18 Survey(s) 22 36 7 4 0 34%

▼ **Building Enclosure** 4 Survey(s) 6 170 0 4 0 0%

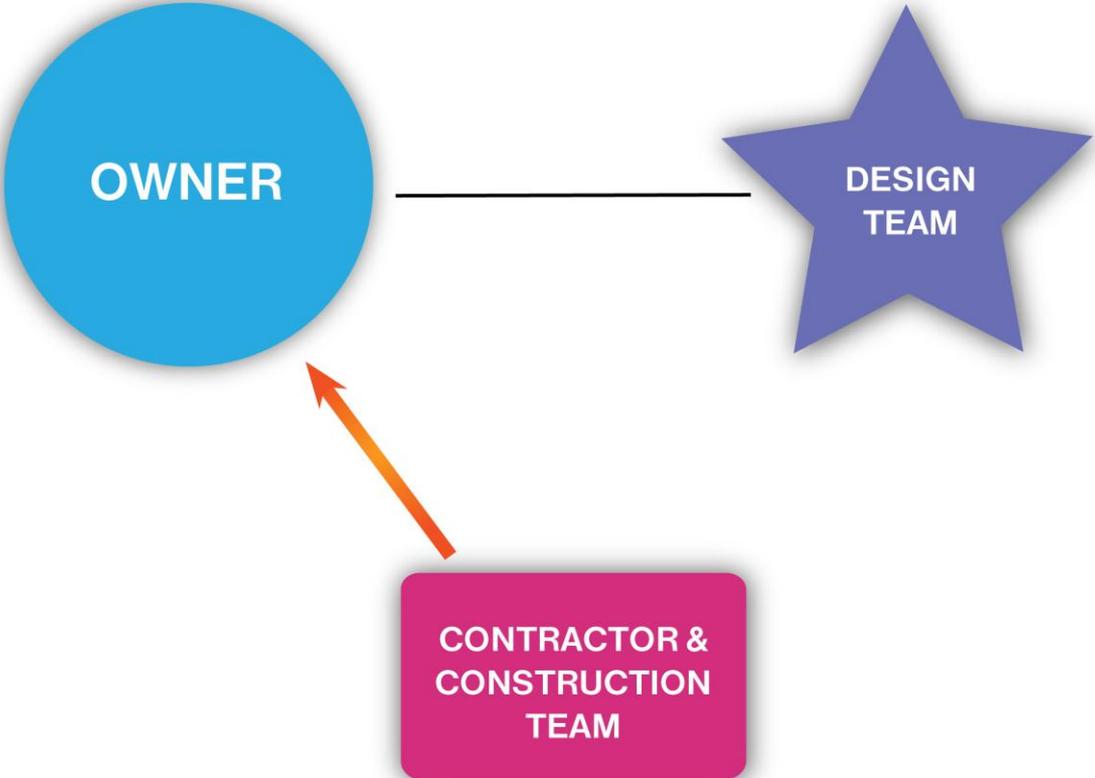
Building Enclosure	Exterior Masonry and Doors	Petra Pearsall	In Progress	3	123	0	3	0	0%	Add View CSV
Building Enclosure	Exterior Wall - 1/A-224, CL BBA - BAX.5	Petra Pearsall	In Progress	1	14	0	0	0	0%	Add View CSV
Building Enclosure	Exterior Wall - FB 41	Petra Pearsall	In Progress	2	14	0	1	0	0%	Add View CSV
Building Enclosure	Roof	Petra Pearsall	In Progress	0	19	0	0	0	0%	Add View CSV

► **Delta Remote (Area Q)** 1 Survey(s) 0 7 21 6 18 38%

► **Existing Building** 7 Survey(s) 7 34 25 11 1 4%

► **Fixed Bridges** 22 Survey(s) 4 128 225 21 20 14%

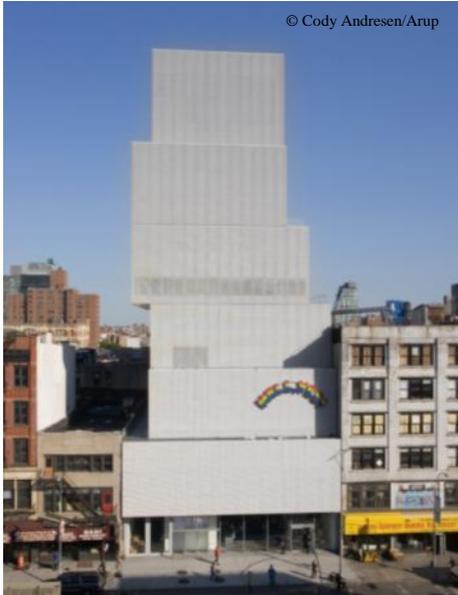
Handing over



In Summary...

“Requirements engineering (RE) encompasses all the **interdisciplinary** activities involved in **determining, documenting** and **maintaining** an agreed set of requirements for a system, and for **tracing** these through to implementation. A specific concern is the development of practical techniques, methods, and tools to support these activities.”

Buildings or 'Vertical Infrastructure'



Starchitects and Jackhammers

Fiona Cousins