

## **BIM for Contractor: Beyond Construction Coordination**

- I. General Contractor's point-of view & interest***
- II. Room Information Management System***
- III. How to develop***
- IV. What we can do with it***
- V. Further Development***



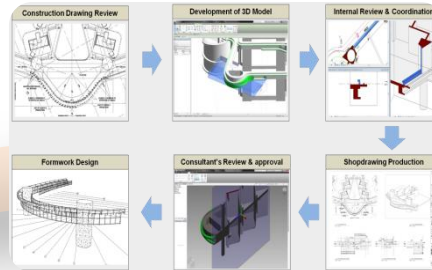
Park Jae Hyuk, BIM Program Manager  
PreConstruction Team, GS E&C

2014. 10. 13

# General Contractor's point-of view & interest



Design Coordination



Shopdrawing Production

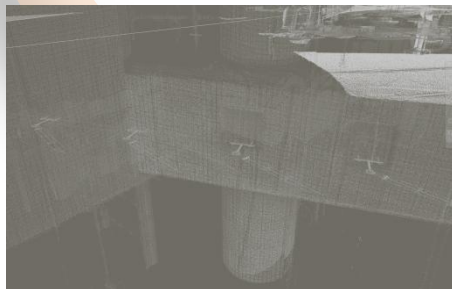


Virtual Mock-up

Others...



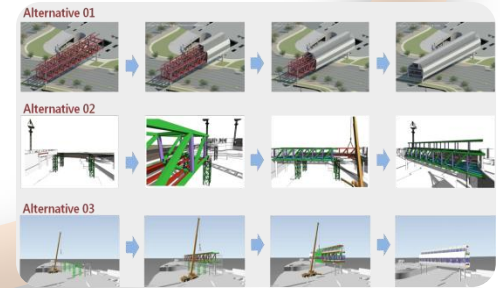
*"With **BIM**, there are **too many** possibilities."*



Work –done Quality -  
Laser Scanning

Room Data		Room Basic Information	
Room No.	Room Name	Room No.	Room Name
001	001	001	001
002	002	002	002
003	003	003	003
004	004	004	004
005	005	005	005
006	006	006	006
007	007	007	007
008	008	008	008
009	009	009	009
010	010	010	010
011	011	011	011
012	012	012	012
013	013	013	013
014	014	014	014
015	015	015	015
016	016	016	016
017	017	017	017
018	018	018	018
019	019	019	019
020	020	020	020
021	021	021	021
022	022	022	022
023	023	023	023
024	024	024	024
025	025	025	025
026	026	026	026
027	027	027	027
028	028	028	028
029	029	029	029
030	030	030	030
031	031	031	031
032	032	032	032
033	033	033	033
034	034	034	034
035	035	035	035
036	036	036	036
037	037	037	037
038	038	038	038
039	039	039	039
040	040	040	040
041	041	041	041
042	042	042	042
043	043	043	043
044	044	044	044
045	045	045	045
046	046	046	046
047	047	047	047
048	048	048	048
049	049	049	049
050	050	050	050
051	051	051	051
052	052	052	052
053	053	053	053
054	054	054	054
055	055	055	055
056	056	056	056
057	057	057	057
058	058	058	058
059	059	059	059
060	060	060	060
061	061	061	061
062	062	062	062
063	063	063	063
064	064	064	064
065	065	065	065
066	066	066	066
067	067	067	067
068	068	068	068
069	069	069	069
070	070	070	070
071	071	071	071
072	072	072	072
073	073	073	073
074	074	074	074
075	075	075	075
076	076	076	076
077	077	077	077
078	078	078	078
079	079	079	079
080	080	080	080
081	081	081	081
082	082	082	082
083	083	083	083
084	084	084	084
085	085	085	085
086	086	086	086
087	087	087	087
088	088	088	088
089	089	089	089
090	090	090	090
091	091	091	091
092	092	092	092
093	093	093	093
094	094	094	094
095	095	095	095
096	096	096	096
097	097	097	097
098	098	098	098
099	099	099	099
100	100	100	100

Quantity Take-off



Work Sequence Review

# Room Information Management System

*"It is **all about information management** in the perspective of General Contractors.  
Linking each others, Following the latest info, Recording & Tracking the on-site results...  
That's what we're always doing on site!!!"*

*Total **4734 Rooms** & Each Rooms **their own functions**. This is a hospital project.*



- *How can we efficiently manage this?*
- *Is there any possibilities to reuse BIM data for ihis?*
- *That's the starting point of this development.*



# How to develop – Requirement Analysis

Not available for GC

Spent too much effort

**Make it  
Easy –to-use,  
Simple,  
& Accurate**

**Quality Data**

Which one is correct

**Quantity Data**

Design Guidelines for Hospitals and Day Procedure Centres  
Standard Components Room Data Sheets

Room Name: Patient Bay - Holding Room Code: PBTR-NA

Area M2: 9

Description: A Patient Bed Bay used for holding of patients prior to procedures, recovery of patients following procedures or for assessment and treatment of patients with non acute conditions. The Patient Bay will have close access to a staff handwashing basin.

Body Protected electrical area

Room Fabric and outline specifications

Room	Fabric	Outline	Specifications	Remarks
1000	Floor finish	Acrylic, washable	Bed protection wall panel	
2000	Skirting	Vinyl	Crash rail at 900mm AFFL	As required, equal to 'Acroyns'
3000	Wall finish	Paint	Crash rail at 900mm AFFL	As required, equal to 'Acroyns'
3062	Wall protection	MDF	Crash rail at 900mm AFFL	As required, equal to 'Acroyns'
4020	Wall protection	Composite	Crash rail at 900mm AFFL	As required, equal to 'Acroyns'
4030	Wall protection	Composite	Crash rail at 900mm AFFL	As required, equal to 'Acroyns'
5010	Ceiling	Plasterboard	Crash rail at 900mm AFFL	As required, equal to 'Acroyns'
6030	Cornice	Aluminium	Crash rail at 900mm AFFL	As required, equal to 'Acroyns'

Fittings and Furniture

Fitting ID	Category	Fitting	Grp	Quantity	Selection
1455	Furniture/ Fitting	Bracket: suction bottle	2	1	
4000	Metalwork	Curtain track, bed	1	1	
6152	Furniture/ Fitting	Dispenser: disposable glove	2	1	
12000	Metalwork	Lowered panel, for storage-bins	1	1	optional

Fixtures, Equipment and associated services

FFE ID	Description	Grp	Quantity	CDW	HW	WmW	Tps	Dns	Stm	Selection
31700	Light: examination, ceiling	1	1	yes						optional

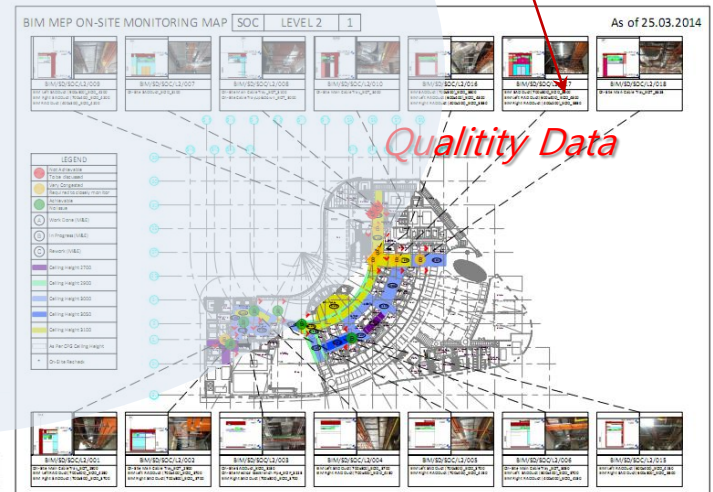
Services

Service ID	Service Category	Description	Quantity	Remarks
1000	Communications	Voice / Data outlet: double	1	
5000	HVAC	Heating, Ventilation & Airconditioning		Refer to Part E Building Services
6001	Lighting	General: colour corrected		
6030	Lighting	Special: downlights		over bed/trolley
7000	Medical Gases	O2		
7020	Medical Gases	Medical Air		Optional
7040	Medical Gases	Suction	1	
8000	Nurse Call	Patient / Nurse call	1	+ indicator button & light
8005	Nurse Call	Patient call handset	1	+ call button on the handset
8010	Nurse Call	Nurse assist call	1	+ indicator button & light
8080	Nurse Call	Emergency call	1	+ indicator button & light
9000	Power	GPO: Single	2	

RF 11500	351 m	4,034 m²
L8 4550	351 m	1,736 m²
L7 4550	351 m	1,631 m²
L6 4550	351 m	1,631 m²
L5 4550	351 m	1,631 m²
L4 4550	351 m	1,631 m²
L3 4800	395 m	1,898 m²
L2 5500	348 m	1,913 m²
L1 7200	384 m	2,768 m²

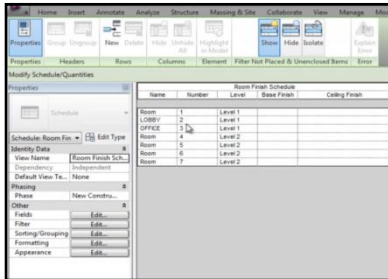
RF 11700	255 m	2,766 m²
L16 4800	472 m	2,264 m²
L15 4500	472 m	2,122 m²
L14 4500	472 m	2,122 m²
L13 4500	472 m	2,122 m²
L12 4500	472 m	2,122 m²
L11 4500	628 m	2,828 m²
L10 4500	704 m	3,167 m²
L9 4500	704 m	3,167 m²
L8 4500	704 m	3,167 m²
L7 4500	704 m	3,167 m²
L6 4500	704 m	3,167 m²
L5 4500	704 m	3,167 m²
4M 4500	600 m	2,701 m²
L4 4500	600 m	2,701 m²
L3 5500	496 m	2,727 m²
L2 5500	480 m	2,640 m²
1M 4050	506 m	2,049 m²
L1 4350	506 m	2,202 m²

RF 5950	158 m	942 m²
L12 4350	414 m	1,676 m²
L11 4050	415 m	1,679 m²
L10 4050	414 m	1,676 m²
L9 4050	415 m	1,679 m²
L8 4050	414 m	1,676 m²
L7 4050	415 m	1,679 m²
L6 4050	414 m	1,676 m²
L5 4050	415 m	1,679 m²
L4 4050	407 m	1,648 m²
L3 4050	424 m	1,715 m²
L2 5550	450 m	2,499 m²
1M 4050	347 m	1,403 m²
L1 4350	347 m	1,507 m²

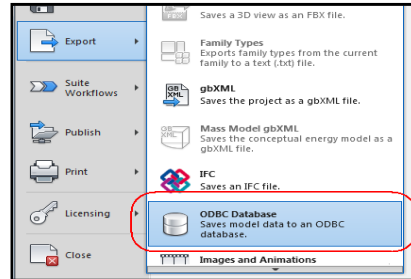


# How to develop – Technical Analysis & Data Extraction

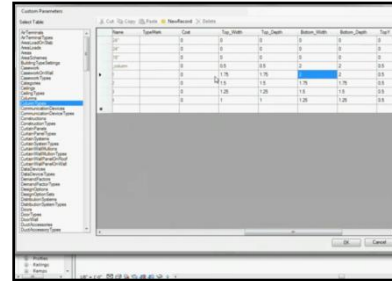
***“ Several aproaches to extract the BIM Data had been looked at. ”***



**Revit Schedule**



**Revit ODBC**



**Revit DBLink**



**Others**

***“ Not all data required for the system can be extracted from BIM (Revit Model) ”***

	Material and Finish	Dimensions	Identity Date	Fire Protection	Other
Room	EAST Finish	Area	Workset	Exits Required	Ceiling Height
	North Finish	Perimeter	Nomber	Occupancy Load Factor	Calculated Occupancy
	South Finish	Unbounded Height	Name		
	West Finish	Volume	Comments		
	Wall Finish	Program Area	Occupancy		
	Wainscot	Computation Height	Department		
	Countertop		Base Finish		
	Finish Cabinet		Ceiling Finish		
			Wall Finish		
			Floor Finish		
			Occupant		

## **Legend**

	Revit Family Name
	Geometric Data (Automatically Generated)
	Required Data (Manually inputted)
	Property Value

**Model Revision**

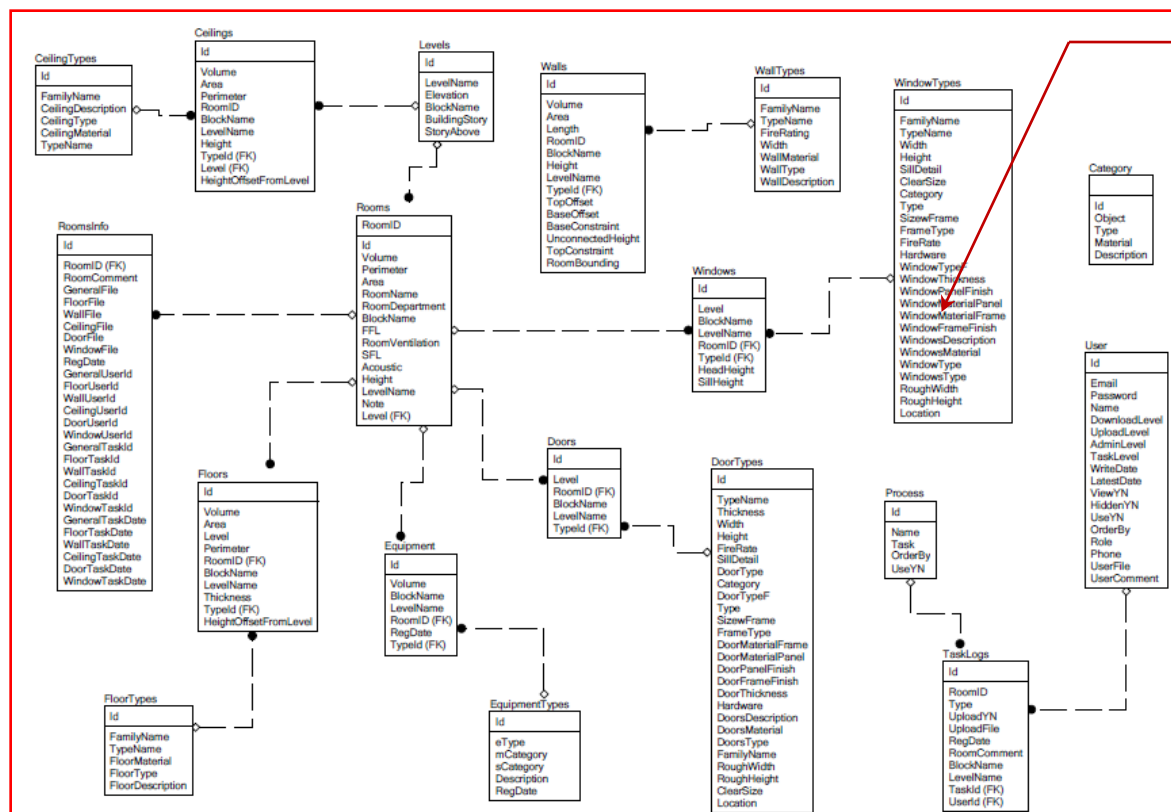
**Revit ODBC**

**Additional Data**

**Database**

***“ A different purpose requires a different modeling method ”***

## ***How to develop – Re-arranging Data and User Interface Design***



### *Data Structure Diagram*

## User Interface Design

Sheet RD-S-B2030 Print

Room Basic Information1

	CT Simulator	
	RD-S-B2035	
	SOC / LEVEL B2	
	RD	
Volume (M3)	Room Ventilation	FFL
95.84	24 A/V	97.38

Floor Finish Information2

Thickness (mm)	Materials
48.00	PLAIN CONCRETE
2.00	Heavy Duty Vinyl Sheet Flooring with Covered Up Skirting

Wall Finish Information3

Height (M)	Materials
6.80	Calcium silicate board
6.80	Calcium silicate board
6.80	Calcium silicate board
6.80	Plaster board
6.80	Plaster board
6.80	Plaster board

WS-R-16038	Staff Rest
WS-R-16037	Toilet
WS-R-16036	Toilet
WS-R-16035	Toilet
WS-R-16034	On Call
WS-R-16033	External Corridor
WS-R-16032	Toilet
WS-R-16031	Shower
WS-R-16030	B2 Ward
WS-R-16029	Clean Utility / Medication
WS-R-16028	B2 Ward
WS-R-16027	Shower

## Room List

Ceiling ID	Ceiling Area (M2)	Perimeter (M)	Ceiling Finish
MFB2	39.53	27.67	2
1	39.53	27.67	

Door & Hardware Information	
Door ID	Width (M)
SD4L_2200	1.05
1 Doors	

## 6 Window & Hardware Information

Room ID	Room Name
WSR-02021	Pneumatic Chute
WSR-02022	Water Chute
WSR-10030	Cleaner's
WSR-10055	Visitor Lounge
WSR-10054	Visitor Toilet
WSR-10056	Visitor Restroom
WSR-10052	Intensive Room
WSR-10051	Pneumatic Chute
WSR-10020	Wire Centre
WSR-10019	Electrical Substation
WSR-10047	Lost Office
WSR-10045	Nursing Office
WSR-10044	Station Room
WSR-10043	Equipment
WSR-10042	Clean Utility
WSR-10041	Treatment
WSR-10040	Medication Room
WSR-10039	Reception/Nurses Station
WSR-10038	Staff Rest
WSR-10037	Toilet
WSR-10036	Toilet
WSR-10035	Toilet
WSR-10034	On Call
WSR-10033	Exterior Control
WSR-10032	Toilet
WSR-10031	Showers
WSR-10030	82 Ward
WSR-10029	Clean Utility / Medication
WSR-10028	82 Ward
WSR-10027	

[illegible]

# What we can do with it – Room Information Check on site

GS E&C Corporation

Main Dash Board

Room Finish Data

Quantity Search & Check

Account Profiles

Log Report

tu.kim@linetek.co.kr

Total 4734 Rooms

1|2|3|4|5|6|7|8|▶

Room Id	Room Name	Dept
WS-R-B2021	PNEUMATIC CHUTE	WS
WS-R-B2020	WIRE CENTRE	WS
WS-R-16060	Cleaner's	WS
WS-R-16058	Central Equipment	WS
WS-R-16057	Floor Pantry	WS
WS-R-16056	Visitors' Lounge	WS
WS-R-16055	Visitor Toilet	WS
WS-R-16054	Visitor(Accessible)	WS
WS-R-16053	Interview Room	WS
WS-R-16052	Wire Centre	WS
WS-R-16051	Pneumatic Chute	WS
WS-R-16050	Electrical Switchroom	WS
WS-R-16048	Last Office	WS
WS-R-16047	Senior Nurse Manage Room	WS
WS-R-16046	Tutorial Room	WS
WS-R-16045	Nusing Officer Room	WS
WS-R-16044	Medical Officer Room	WS
WS-R-16043	Equipment	WS
WS-R-16042	Clean Utility	WS
WS-R-16041	Treatment	WS
WS-R-16040	Medication Room	WS
WS-R-16039	Reception/ Nurses Station	WS
WS-R-16038	Staff Rest	WS

WS-R-B2021 PNEUMATIC CHUTE

Click here to Rooms Search.

Print

Excel

1. Room Data - General

Drawing File

Q Select..

Upload

On-site Preparation

Room Name

PNEUMATIC CHUTE

RoomID

WS-R-B2021

Location Info. (Block/ Level)

RH / B2

Department/ Description

WS

Note

N/A

Room Comments

20131206 Comments Testing checked DAR-3044

Submit

Area (M2)	Perimeter (M)	Height (M)	Volume (M3)	Room Ventilation	Acoustic	SFL	FFL
8.29	10.88	2.7	0	M/V	N/A	97.28	97.33

2. Floor Finish Details

x Drawing File

Q Select..

Upload

Work Completed

Types	Materials	Type Name	Area (M2)	Volume (M3)	Thickness (mm)	Description
TILE	TF8	TF8	6.72	0.07	0.01	TF8 300X600 HM6028
N/A						

2 Floors

3. Wall Finish Details

7. Sanitary Item

Equipment Name

x Drawing File

Q Select..

Upload

Register

Equipment	Type	Count	Description	Modify	Delete
Toilet Accessories	TA-01	3	Description for Toilet Accessories	Modify	Delete
Grab Bars	GB-02	2	Description for Grab Bars	Modify	Delete
	HK-04	1	Description for Toilet Rack/ Rails/ Hooks	Modify	Delete

Type of Equipment

See the Sketch SKT-335  
Follow the DAR comment. See the DAR-  
Uploaded DAR-333

Equipment / Count Modify

Submit

Comment Submit



# What we can do with it – Quantity Review for Construction

Singapore BIM Data Man x

sin.linetek.co.kr:8081/?gmenu=data

GS E&C Corporation Main Dash Board Room Finish Data **Quantity Search & Check** Account Profiles Log Report tu.kim@linetek.co.kr

### Integrated Search

Block Select : All

Level Select : All

Department Select : ☒ All ☒ WS ☒ BM ☒ AM ☒ TR ☒ AD ☒ MR ☒ ES ☒ SR ☒ DS ☒ CG ☒ TO ☒ LR ☒ SQ ☒ FD ☒ CO ☒ OPAT ☒ ML ☒ CK ☒ AE ☒ FM ☒ MS ☒ SL ☒ GM ☒ FU ☒ PA ☒ CY ☒ NSC ☒ S ☒ HP ☒ SW ☒ SP ☒ WD ☒ WP ☒ WC ☒ MM ☒ AH ☒ R ☒ CL ☒ COR ☒ RM ☒ RD ☒ MT ☒ FC ☒ CS ☒ PH ☒ DI ☒ HT ☒ CE ☒ RB ☒ RT ☒ E ☒ GR ☒ IS ☒ CM ☒ WB ☒ ME ☒ OT ☒ RC ☒ DB ☒ ON ☒ ET ☒ BS ☒ MK ☒ LB ☒ UR ☒ IC ☒ DN ☒ OS ☒ GS ☒ L ☒ WK ☒ EN ☒ WR ☒ EY ☒ HS ☒ CF

Object Select : All

Type Select : All

Material Select : ☒ All ☒ 100 ☒ 1000 ☒ 125 ☒ 1400 ☒ 150 ☒ 1500 ☒ 1550 ☒ 1600 ☒ 1650 ☒ 1800 ☒ 1950 ☒ 200 ☒ 2050 ☒ 225 ☒ 2400 ☒ 250 ☒ 2700 ☒ 280 ☒ 300 ☒ 350 ☒ 400 ☒ 450 ☒ 470 ☒ 500 ☒ 550 ☒ 600 ☒ 625 ☒ 700 ☒ 725 ☒ 800 ☒ 900 ☒ ACE ☒ ACP ☒ AHP ☒ ALB ☒ APP ☒ Aquatough Board\_PW ☒ B1 ☒ B2 ☒ B3 ☒ Calcium Silicate Board\_PL ☒ Calcium Silicate Board\_WL-1 ☒ Calcium Silicate Board\_WL-3 ☒ CF-B1 ☒ CF-B2 ☒ CF-B3 ☒ CF-G1 ☒ CF-G2 ☒ CF-G3 ☒ CF-O1 ☒ CF-O2 ☒ CF-O3 ☒ CF-P1 ☒ CF-P2 ☒ CF-P3 ☒ CF-R1 ☒ CF-R2 ☒ CF-R3 ☒ CF-Y1 ☒ CF-Y2 ☒ Chip board\_PO ☒ CONC1 ☒ CONC2a ☒ CONC2b ☒ CONC3 ☒ CONC4 ☒ CSB ☒ Fire Board\_P1F ☒ Fire Board\_P2F ☒ Fire Board\_PA2 ☒ GP1 ☒ GP2 ☒ GP3 ☒ GP4 ☒ GP5 ☒ GP6 ☒ GP7 ☒ GP8 ☒ Gypsum Board\_P ☒ Gypsum Board\_PA1 ☒ Gypsum Board\_Pc ☒ Gypsum Board\_PL ☒ Gypsum Board\_PW ☒ Gypsum Board\_WL-1 ☒ MFB1 ☒ MFB2 ☒ MFB3a ☒ MFB3b ☒ MFB4 ☒ PLB ☒ RU ☒ STUDS\_53 ☒ STUDS\_75 ☒ TF1 ☒ TF10 ☒ TF11 ☒ TF12 ☒ TF12a ☒ TF13 ☒ TF13/13a ☒ TF13a ☒ TF14a ☒ TF2 ☒ TF3 ☒ TF4 ☒ TF5 ☒ TF6 ☒ TF6/6a ☒ TF7 ☒ TF7/7a ☒ TF8 ☒ TF8a ☒ TF9 ☒ TF9a ☒ TF9b ☒ TW10 ☒ TW6 ☒ TW7 ☒ TW7/7a ☒ TW8 ☒ TW8/8b ☒ TW8a/8b ☒ TW9 ☒ TW9/9a ☒ VF1 ☒ VF10 ☒ VF11 ☒ VF12 ☒ VF13 ☒ VF2 ☒ VF3 ☒ VF4 ☒ VF5 ☒ VF6 ☒ VF7 ☒ VF8 ☒ VF9 ☒ VSF1 ☒ VSF2 ☒ VSF3 ☒ VSF4 ☒ W1 ☒ W2 ☒ W3 ☒ W4

*Sort & Calculate the quantities as you want.*

*If necessary, export it in Excel Format.*



### ***What we can do with it – Construction Progress Check***

The screenshot displays the Singapore BIM Data Manager web application interface. The top navigation bar includes links for Main Dash Board, Room Finish Data, Quantity Search & Check, Account Profiles, and Log Report. The main content area is titled "Finish Work Progress - By Level / By Block" and features a progress bar with stages: Drawing Review, Drawing Approved, On-site Preparation, On-site Work, and Work Completed.

The primary data table shows work progress by level (U-RF) and block (SOC, RH, CH). The table columns include Object, Wall, Floor, Ceiling, Door, and Window. Progress is indicated by numerical values (e.g., 0/0, 0/605) and visual progress bars. A red box highlights the "Work History" section, which shows a detailed view of work done by floor (01 to 31) and room (01 to 31). A red text overlay asks: "Work History – Who's done What?".

Below the main table, a section titled "Work Done / Weekly Work Done Report" compares work done last week (2013-12-01 to 2013-12-07) and this week (2013-12-08 to 2013-12-14). The table columns include Wall, Floor, Ceiling, Door, and Window. A red text overlay asks: "Weekly Progress – Last week & This Week - Is this week better?".

At the bottom, a copyright notice reads: "COPYRIGHT © LINETEK SYSTEM LTD. ALL RIGHTS RESERVED."

# What we can do with it – Drawings & Documents Control

10. Room Recent History

View details >

View for all history

Object	Task User	Task Date	Task Type	Task Contents	Send
General	Park Jaehyeok	2013-12-16 18:33:00	Room Comments	the DAR comment. See the DAR-336 Uploaded	
General	Park Jaehyeok	2013-12-16 18:31:00	Room Comments	the DAR comment. See the DAR-336 Uploaded	
General	Park Jaehyeok	2013-12-16 18:31:00	Room Comments	the DAR-336 Uploaded DAR-333 Drawing	
General	Park Jaehyeok	2013-12-16 18:30:00	Room Comments	Follow the DAR comment. See the DAR-336	
General	Park Jaehyeok	2013-12-16 18:29:00	Room Comments	See the Sketch SKT-335	
General	Kim Tonguck	2013-12-11 18:24:00	File Upload	Drawing File	
General	Park Jaehyeok	2013-12-10 18:01:00	Room Comments	omments Testing checked DAR-3044	

Account Profile Page

Account Profile EDIT USER

Kim

Position : Developer  
E-mail : [@ilnetek.co.kr](mailto:gilnetek.co.kr)  
Phone : 070-0005  
Last Access : 2013-12-24 08:47:57

Send Message Web Form

Send Message

☒ Members

Title

Block Level RoomID - Date . Time

Contents

History Contents (only Text)  
=====

Add comment individual..

Send

Room Recent History / Log Report

10. Room Recent History

View details >

Object	Task User	Task Date	Task Type	Task Contents	Send
General	Park Jaehyeok	2013-12-16 18:33:00	Room Comments	the DAR comment. See the DAR-336 Uploaded	
General	Park Jaehyeok	2013-12-16 18:31:00	Room Comments	the DAR comment. See the DAR-336 Uploaded	
General	Park Jaehyeok	2013-12-16 18:31:00	Room Comments	the DAR-336 Uploaded DAR-333 Drawing	
General	Park Jaehyeok	2013-12-16 18:30:00	Room Comments	Follow the DAR comment. See the DAR-336	
General	Park Jaehyeok	2013-12-16 18:29:00	Room Comments	See the Sketch SKT-335	
General	Kim Tonguck	2013-12-11 18:24:00	File Upload	Drawing File	
General	Park Jaehyeok	2013-12-10 18:01:00	Room Comments	omments Testing checked DAR-3044	
General	Park Jaehyeok	2013-12-10 18:00:00	Room Comments	131206 Comments Testing	
General	Park Jaehyeok	2013-12-10 18:00:00	Room Comments	206 Comments Testing checked	
General	Park Jaehyeok	2013-12-10 17:59:00	Room Comments	131206 Comments Testing	

# Further Development – Possibilities & Limitation

*"Early involvement of the general contractors is requested."*

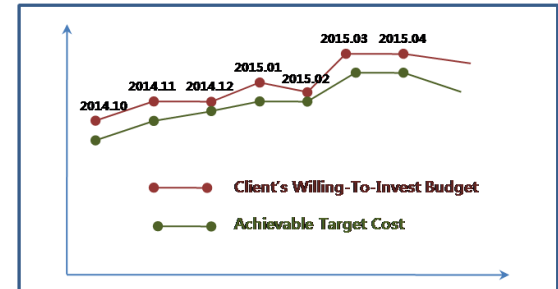
*How can we manage **the project information generated from the very stage?***

*The more integrated and structured ways are needed.*

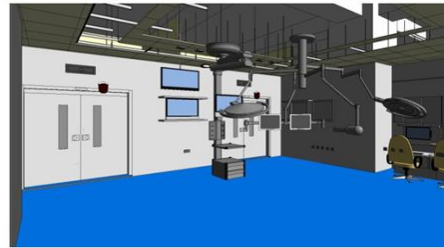
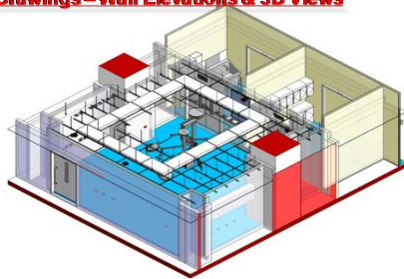
## Project Information - Overview

	Requirement		Design		Cost	Work
	Func.	Tech.	SBS	DBWS	CB\$	WB\$
Create	130	94	100	94	330	846
Link	122	34	92	90	330	170
Detail	5	4	5	3	5	8
New	8	1	0	0	60	146
Revise	0	0	12	1	12	0

## Target Cost Track



## Drawings – Wall Elevations & 3D Views



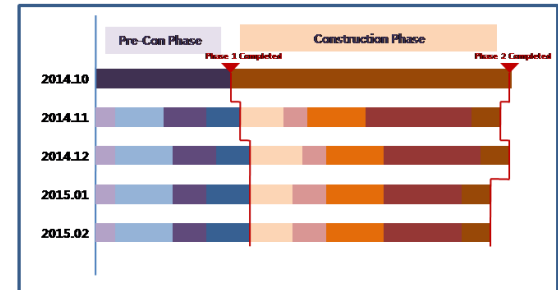
3DView

## Activities & Issues

Agenda	Ref. ID	Attendees	Remarks
IVC Deviation	R.14.003.02	PJH, GS	
Confirmation	R.14.003.03	LSG, GS	
	S.01.002.01	JSW, HN	
	C.03.004.04		
Monthly TVD	W.11	PJH, GS	
Reporting	R.16		
	R.17.002		

Requested by	Approved by	Remarks
KHC, SW	(JSW, HN)	+ 7 days

## Target Schedule Track



*"The data flow should be bi-directional among the several systems."*

*How can we integrate BIM data in certain model-authoring tool with other in-house systems?*

Wall Elevation 01

Wall Elevation 02



## Closing

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*" Again, it is **all about information management.** "*

*" Thank you -*