Content

Appendix

1.0 What's New

All new changes are highlighted by grey font with underline.

1.1 Auto colouring for GBP submission

The new ACS Revit template supports auto colouring for GBP submission together with a user manual is included.

1.2 Assign Auto-Increment Number/Alphabet Refer section 4.4 for details.

2.0 Upgrade project from previous version of ACS

2.1 Refer Appendix A to upgrade project from previous version of ACS.

3.0 Setting Up

3.1 Installation

Login as administrator, insert installation CD. A set up wizard will launch automatically, if no

wizard launches then double click the setup.exe in the installation CD. Follow to setup wizard and the programme "ACS" will be installed at C:\Program Files\ACS@Revit release year\ automatically. If your Program Files folder is not under C:\, refer Section 4.3 for manual customization.

3.2 Authorization

Select RevitRegister.exe in C:\Program Files\ACS@Revit release year\Register, right click, and then select "Run as administrator". Enter user information. Press "Generate Request Code" button and then press "Save Code to File" button.
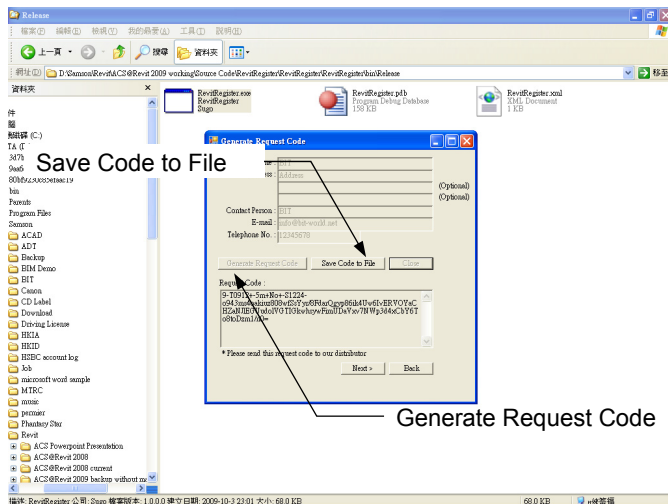
Another window will pop up. Save the code to

a new license txt file by pressing "New" button. Or if you have purchased several licenses of ACS, save all codes to the same license txt file by pressing "Update" button and then select the license txt file. Alternatively, you can copy the request code and send to our authorized distributor directly.

Create New or Update Existing File
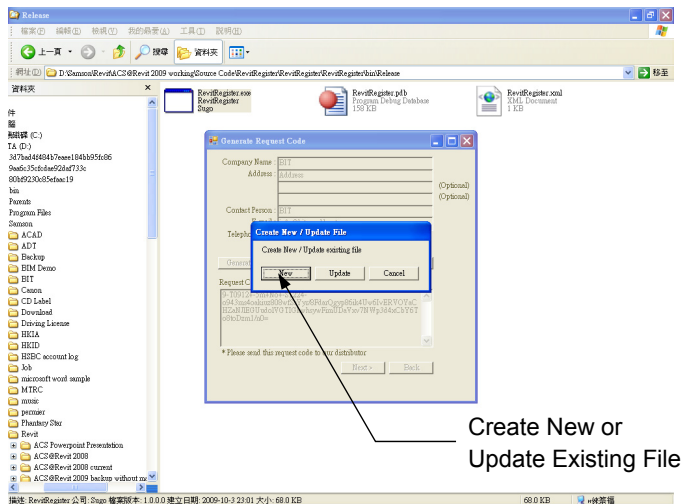
Click on the "Next" button to finish uploading ACS tools to Revit.

Start Revit, confirm to always load all ACS functions. Select Add-ins under Contextual tab and select External Tools under Ribbon to check if new tools for statutory calculation are installed. To test whether ACS can run popularly, open "ACS release year Test

Project.rvt" at C:\Program Files\ACS@Revit release year\Sample Project\. Under the default view, you can see a calculation summary with no result calculated. Select "External Tools\GFA Calculation" under Add-ins tab, check if the result is calculated. Refer to the section 6.0 troubleshooting if there is no response.
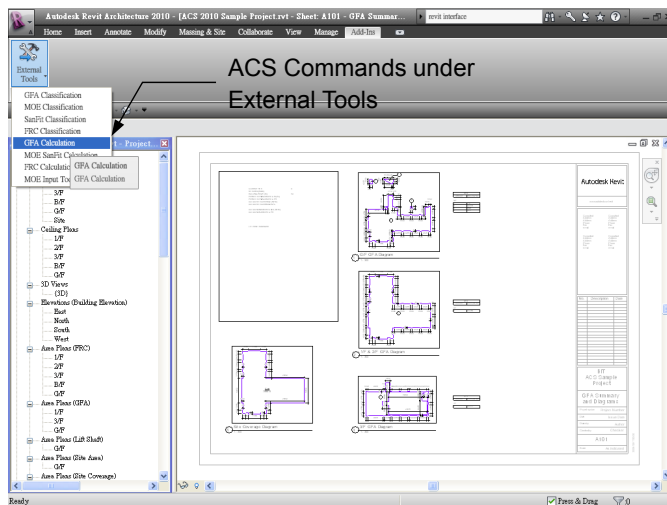
You can run ACS under trial mode for 10 days. To activate ACS, send the license txt file to our authorized distributor for a return of an authorization file. To enter the file, double click RevitRegister.exe, press "Open" button and select the authorization file. This completes ACS authorization.

Open the authorization code file to complete the process
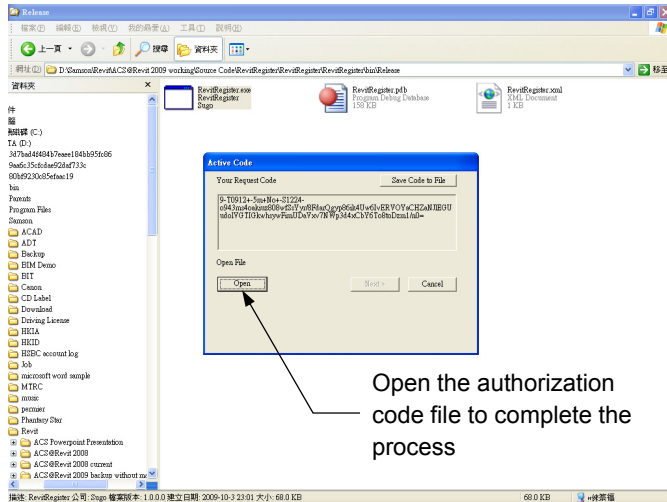
3.3 Setting up ACS shared parameters

Select "Shared Parameters" under Manage tab. Select Revit_GBP_Shared_ Parameter.txt in C:\Program Files\ACS@Revit release year\Shared Parameter. This allows you to call the parameter value directly on plan and is useful for checking.

Click "Shared Parameters" first

Then click here and browse to the shared parameter text file
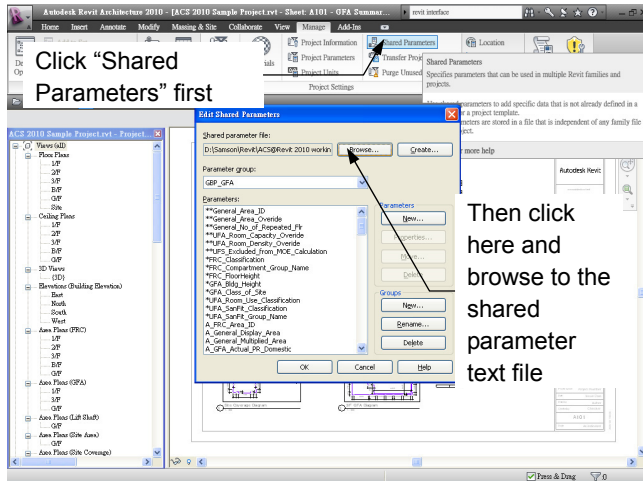
3.4 Uninstall ACS

The current version of ACS does not support uninstallation. If you want to uninstall ACS, follow the below steps:

- Delete files BIT_ACS.addin. For Windows XP, the files are located under C:\Documents and Settings\All Users\Application Data\Autodesk\Revit\Addins\release year\. For Windows Vista and 7, the files are located under C:\ProgramData\Autodesk\Revit\Addins\release year

This removes ACS from your computer.

4.0 Getting Started

4.1 Basic Concept of Using ACS

To start using ACS, create a new project from ACS template. If area breakdown is required and available, select the template ACS Template UFA by Room AB customized under C:\Program Files\ACS@Revit release year\project template\area breakdown. Otherwise select the template ACS Template UFA by Room located in C:\Program Files\ACS@Revit release year\project template. Two templates are provided which use "room" and "area" respectively for UFA calculation. In general, "Room" is recommended as it is more efficient to create. But if the drafting is mainly prepared by Autocad and Revit is mainly used for submission then "Area" is more appropriate.

If you have started a project which is not generated from the template file, you have to transfer the template setting to your project, refer appendix A for instruction.

There are basically three steps required to generate statutory calculation by ACS:-

- Create area / room
- Provide essential data
- Run calculation

Detail description of these steps will be provided in the following paragraphs.

4.2 Create Area / Room

Create "Area" or "Room" for different type of calculation. As Revit can generate the area boundary of the outer side and inner side of the building external walls automatically, "Area" is an efficient mean for GFA and FRC calculation. And "Room" is an efficient mean for UFA calculation. Refer to below table for a recommended approach to define different types of area:

Area Type	Approach
Site Area, GFA, Site Coverage, FRC	"Area"
UFA & UFS	Use "Room" in general, use "Area" if project is imported from Autocad and Revit model will not be built.

4.2.1 Area

First of all, create area plan views to organize areas. This enables ACS to present the calculation result in a correct manner. Six types of area plans are provided in ACS Template: Site Area, Gross Building, Non-Accountable

GFA, Site Coverage, UFA & FRC. Create floor views for each type of area plans by clicking "Area\Area Plan" under Home tab, and then select relevant floors to create area plan views. Allow Revit to generate the area boundary for Gross Building & FRC area plans if a Revit model is defined. Select "no" if the project is imported from Autocad.and Revit model is not available.
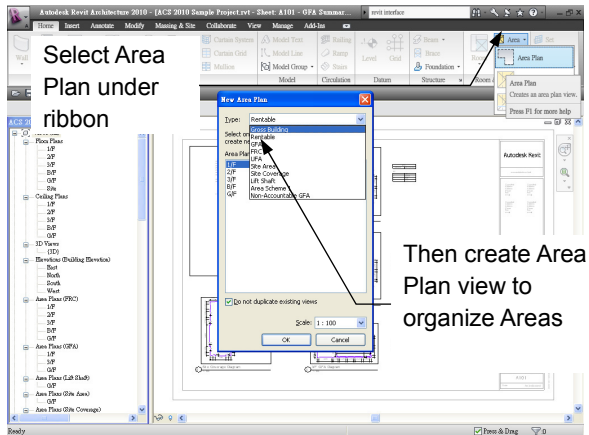
Below table indicates how to organize the areas.

Type of Area	Areas to be placed under

Plan	the area plan
Site Area	Site Area
GFA	Domestic / Non-Domestic GFA. Dedicated area, if there is "dedicated area" but no "dedicated area to b3e deducted", then all "dedicated area" should be placed under Non-Accountable GFA Area Plan.
Non-Accountable GFA	Domestic / Non-Domestic GFA to be deducted. Lift shaft area of different accommodation. Dedicated area to be deducted.
Site Coverage	Domestic / Non-Domestic Site Coverage
UFA	UFA & UFS (if "area" approach is used for UFA)
FRC	Area representing fire compartment

Switch to the view of a relevant area plan. Command of "Area\Area

Boundary" under Home tab will become available. Select it and use the tools under "Place Area Boundary" tab to draw / amend area boundary lines.

Select Area Boundary

Then use the options here to create area boundary
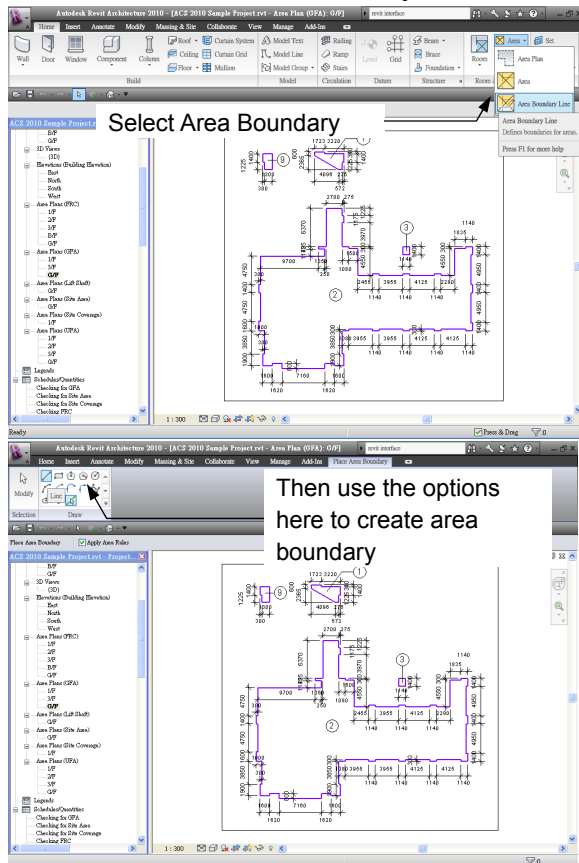
If it is required to convert lines imported from Autocad to area boundary, select command of area boundary under

Home tab, turn off "apply area rules" under option bar. Move the cursor over the imported lines, press "tab" to alter the selection and select the loop, then left click to confirm.
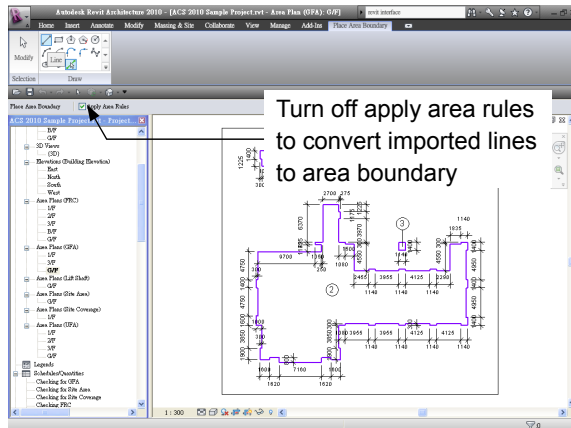
Next step is to create "areas" within boundary lines. Select "Area\Area" under Home tab, switch the tag to M_Area Tag_ID under "Place Area" tab, then click anywhere within the area boundary. For site area, switch the tag to one of the below as per the nature of the project:

- M_Area Tag_GBP_Composite
- M_Area Tag_GBP_Composite_
  w_Dedication
- M_Area Tag_GBP_Domestic

- M_Area Tag_GBP_Domestic_ w_Dedication
- M_Area Tag_GBP_NonDom
- M_Area Tag_GBP_NonDom_ w_Dedication

If lift shaft concession is adopted, copy the area tag of site area and switch it to M_Area Tag_Lift_Shaft.

Click Area

Then switch to M_Area Tag_ID and click anywhere within area boundary
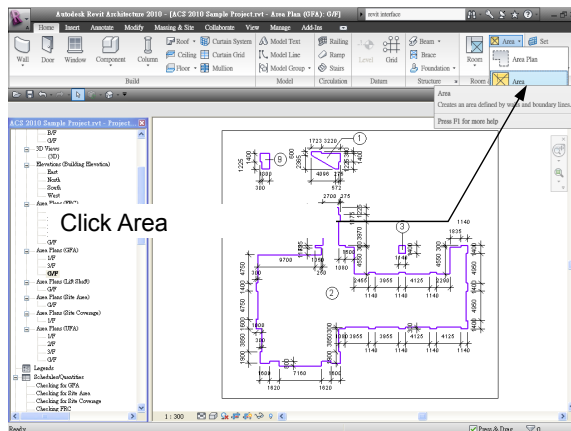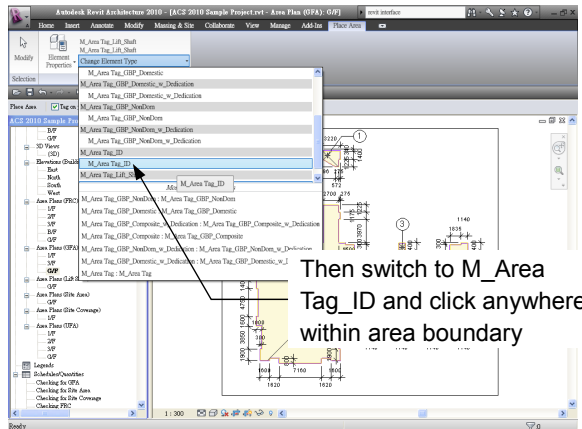
If it is required to present GFA concession summary, copy the area tag of site area and switch it to M_Area Tag_Concession.

Remember, **DO NOT use ellipse or spline to draw area boundary**. These shapes cannot be converted to polyline in Autocad and will be a problem when you export the calculation to Autocad for electronic submission. **If you are required to use area breakdown, do not create a loop of area boundary within another loop of area boundary** as otherwise area breakdown cannot be performed. If there is any non-accountable GFA such as pipe duct

that need to be deducted for GFA calculation, create the boundary in a separate area plan "Non-accountable GFA" and define it as GFA to be deducted.

4.2.2 Room

To create room, select "Room\Room" under Home tab, switch the tag to M_Room Tag_ID under "Place Room" tab, then click any internal space within a building.

4.3 Area Breakdown

If area breakdown is required and available, follow the procedures under Appendix D, otherwise follow the next section to provide essential data.

4.4 Assign Auto-Increment Number/Alphabet

Use this tool to assign increment number/alphabet to area, room, window, door and family instance such as parking space or equipment. The tool is useful for government submission, preparation of general plan and tender drawings.

Select External Tools\Auto-Increment Value under Add-Ins tab. The Auto-Increment Value tool will appear. Confirm all following settings

then click execute:

Setting	Description
Auto Value Setting	The tool assigns value according to location with respect to X, Y, Z coordinates. Confirm sequence of X, Y, Z. Confirm ascending / descending sequence for each axis.
Sequence by for "Area" and "Room"	Either by corner or location point. Corner point is recommended.
Restart Value	Restart value for area under different area scheme, which can be used if multiple areas are selected and are located under different area schemes. Restart value for door etc. under different room. This is useful to assign door number according to common practice. Recommended usage: select all doors on same floor, check this option, set start value as "A", then the program will assign value for doors "A" "B" "C" etc. under room 1, and then restart and assign value "A" "B" etc. for door under room 2.
Assign Value	Either by number or alphabet. Provide start value. Provide

	Prefix and Suffix.
Filter	It lists type of selected items **even the items are grouped**. Confirm assign value to which type of item by clicking the check box.
Apply to Parameter	It lists common parameters of checked items under above filter. It lists all text parameter. If assign value, prefix + value + suffix is a number and not start with "0", it also lists numeric parameter. Select which parameter to store the value. Support auto search.

4.5 Provide essential data

The next step is to provide essential data through ACS classification tools. The classification tools are composed of three sections, 1) essential parameters, 2) override parameters and 3) description. All data under "essential parameters" must be provided. Data under "override parameters" is optional. It allows a flexible calculation to suit different situation. "Description" explains the implication of each editable data. Detail descriptions & procedures for GFA, MOE, Sanfit & FRC calculations can be found in the following

paragraphs.

Auto text search is supported for all drop down lists. The lists include GFA Classification list and GFA Concession list under GFA Classification tool, and MOE, SanFit, FRC Classification lists under their respective tools. Type whatever text under the text box of above lists, and then the drop down list will list all options containing the input text. For example, type "office" under MOE Classification list text box, then the drop down list will only show "Class 4a – offices and staff rooms". Leave the text box empty to show all available options.

By default, MOE and FRC classification tools are defined according to FS code 2011. To switch to old FS code, select External Tools\ACS Calculation Setting under Add-Ins tab. The setting can be found under MOE tab.

It is recommended to add a colour scheme to all generic plans and area plans before providing essential data. This makes it easier to identify the data by different colour. A number of colour schemes are preset under

ACS template. Select colour scheme legend under design bar, and then click anywhere on plans. Follow below table for the selection of colour scheme:

Plan	Colour Scheme
Generic Plan / UFA Area Plan	UFA MoE Room Use Class./ UFA SanFit Class.
Grossing Plan, Non-Accountable GFA and Lift Shaft Area Plan	GFA Class.
FRC Area Plan	FRC Class.

4.5.1 GFA Calculation

Switch to the relevant area plans, select area(s) representing GFA, Site Coverage, Site Area, Dedicated Area or Lift Shaft, and then select External Tools\GFA Classification under Add-Ins tab. The GFA classification tool will appear.

Under essential parameters, classify the area as site area, domestic / non-domestic site coverage, domestic / non-domestic GFA or dedicated area. If

an area is classified as site area, the item "Building Height in metre" & "Class of Site" will become editable. Input figures accordingly.

If necessary, input the following figures under override parameters:

Parameter	Information Required
GFA Concession	Select any item under the list which is defined under PNAP APP151. The program will list area summary per floor and per project under schedule "GFA Floor Summary" and "GFA Concession Summary".
Area Override	Any number in sq.m. e.g. 163.023. If a number greater than 0 is assigned, the program will use this value to summarize the calculation, which is useful for site area if the exact area is defined under lease condition. Reset to 0 to cancel the override
Number of Repetition	If an integer greater than 1 is assigned, the program will multiply the area by this factor,

	which is useful for multiple typical floors. Reset to 0 or 1 to cancel the override.
Area Discount in %	default set as empty field and count as 100%, assign any number greater than 0 to override, press the button next to the field to set it to 50%.
GFA Group	default set as empty field. Insert any group name and then calculation of GFA under same group will be reflected in schedule "GFA Floor Summary". For example, group name such as "retail", "GIC" (government institution or community) can be inserted. Then total retail and total GIC area will be reported in the Floor Summary Schedule which is useful when required under Outline Zoning Plan or Lease.
GFA Concession Group	default set as empty field. Insert any group name and then calculation of GFA Concession under same group will be

	reflected in schedule "GFA Floor Summary". For example, group name such as "Lift Machine Room" and "Refuse Room" can be inserted. Then total Lift Machine Room and Refuse Room area will be reported.

Starting from release 2009, ACS supports the following cases of lift shaft concession:-

Accommodation	Basis of exemption
Domestic	Based on total domestic GFA only
	Based on total GFA, if lift shaft concession for hotel & office is also applied in the same project, the total GFA will exclude the GFA of hotel and office
Hotel	Based on total hotel GFA only
	Based on total GFA, if lift shaft concession for office

	is also applied in the same project, the total GFA will exclude the office GFA
Office	Based on total office GFA

By default, domestic / hotel lift shaft calculation is based on total domestic / hotel GFA respectively. To change the setting, select External Tools\ACS Calculation Setting under Add-Ins tab. The setting can be found under GFA tab. Alternatively, select Project Information under Manage tab, then uncheck the parameter "Domestic_ Accommodation_Lift_Shaft_Concessio n_based_on_total_domestic_GFA_only " or "Hotel_Accommodation_Lift_Shaft_ Concession_Based_on_total_hotel_GF A_only".

If there are hotel / office accommodation in the project, clearly define the GFA as GFA-Non-Domestic hotel / office area under the GFA classification tool. This enables ACS to calculate the lift shaft concession.

GFA Classification is finished. Refer

section 2.4 for running calculation.

4.5.2 MOE & SanFit Calculation

First select room(s) or area(s) representing UFA and then select "External Tools\MOE Classification " under Add-Ins tab. MOE classification tool will appear.

Under essential parameters, you can find a list of options under the MOE Classification Box which are defined according to Code of Practice. Pick the appropriate option and apply.

If the project is designed according to FS code 2011, and you have to check the MOE requirement per each compartment, then you are also required to provide the compartment name under essential parameters. Select all areas belonging to the same compartment, select the MOE classification tool and assign a **unique** compartment name under essential parameters.

If necessary, input the following figures under override parameters:

Parameter	Information Required

Area Override	Any number in sq.m., e.g. 163.024. If a number greater than 0 is assigned the program will use this value to run the calculation. Useful for A&A works. Reset to 0 to cancel the override.
Capacity Override	Any integer. If a number greater than 0 is assigned the program will use this value and ignore the room area & room density, which is useful when the capacity is based on head count. Reset to 0 to cancel the override.
Density Override	Any number, If a number greater than 0 is assigned the program will use this value together with the area to calculate the room capacity, which is useful when the room use is not defined in code of practice of MOE. Reset to 0 to cancel the override.
MOE Group Name	By default, ACS will calculate the floor exit requirements for all rooms/areas under same level. If you have several towers at same

level, and want to split the floor calculation tower by tower, assign unique group name for all rooms/areas under same tower. ACS will split the calculation accordingly. It is highly recommended to use the format of "01 G/F Tower 1" for MoE Group Name, where 01 represents floor display order, G/F represents floor name, Tower 1 represents sub group name. Remember to unhide the field **MOE_Group_Name under the floor exit schedule to present the result.

Revit has sorting problem for empty field parameter. To prevent sorting problem in floor exit schedule, if you are going to use the default calculation method and leave all MOE Group Name as empty field, turn off sorting by **MOE_Group_Name of the floor exit schedule. If you are going to

	assign value to the MOE Group Name, make sure no MOE Group Name is empty.
Class 5a => 12m above G/F	Only applicable under FS code 2011. Default set to false. If an UFA is set to true, requirement on exit route for room, compartment and floor will be upgraded accordingly.

Under the input parameters you can enter the room name of the UFA. This is optional and does not affect the calculation result.

In general, areas classified for MOE Calculation are also used for SanFit Calculation. Select the area(s) representing UFA again and select "External Tools\SanFit Classification "under Add-Ins tab. Under essential parameters you can find a list of options under the SanFit Classification Box which are defined according to Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations and Education

Ordinance. Pick the appropriate option and apply. If you have a small area that only provide one toilet for both male & female, select the option "SanFit-13-Single Toilet Provision". Or if the use is not within all the listed options, leave the area / room as unclassified and then you can input all the requirements manually.

Next step is to instruct ACS how you want to summarize the SanFit Calculations by means of grouping. Select all areas belonging to the same group, select the SanFit classification tool and assign a **unique** SanFit group name under essential parameters. For example, if your project has 5 floors and you want to summarize the SanFit Calculation in one group from G/F to 3/F, one group for 4/F and one group for 5/F, simply assign a unique group name "SF GROUP 01 : G/F – 3/F" for all UFAs from G/F to 3/F, group name "SF GROUP 02 : 4/F" for all UFAs at 4/F & group name "SF GROUP 03 : 5/F" for all UFAs at 5/F. ACS will then complete

the calculation according to this grouping.

Under override parameters edit the following parameter if necessary:

Property	Information Required
Exclude from MOE	Default is "False", If it is switched to "True" the program will exclude the room capacity for MOE Calculation. Useful for room such as lobby and pantry.

MOE & SanFit Classification is finished. Refer section 2.4 for running calculation.

By default, the Sanfit calculation follows the current Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations. If you decide to run the SanFit Calculation according to PNAP 297, or the follow the old regulations, select "External Tools\ACS Setting" under Add-Ins tab. Then go to SanFit tab to adjust the setting.

ACS supports to use either "room" or "area" for MOE & SanFit calculation. select "External Tools\ACS Calculation

Setting" under Add-Ins tab. Then go to MoE and SanFit tab to adjust the setting.

4.5.3 FRC Calculation

First select area(s) representing fire compartment and then select "External Tools\FRC Classification" under Add-Ins tab. FRC classification tool will appear.

Under essential parameters, you can find a list of options under the FRC Classification Box which are defined according to code. Pick the appropriate option and apply. If you have plant rooms requiring 1 / 2 / 4 hour fire resistance period, classified it as special hazard area with specified fire resistance period.

If necessary, provide floor height for the area(s). Use the FRC Classification tool again. Enter the floor height in metre then click the "apply" button.

Next assign the compartment name through the FRC classification tool. Apply a **unique** compartment name for

all areas belong to same compartment. Different compartment must have a different and unique compartment name.

Under override parameters you can override the area if necessary.

4.6 Run calculation

Before you run the calculation, we suggest you to have a quick check and make sure all essential data are assigned and correct. Click the schedule with name starting with "checking", e.g., for GFA Calculation, switch to the schedule named "Checking for GFA", make sure all areas are defined under the parameter "*GFA_Classification" and fields are left blank for parameter "*UFA_Room_Use_Classification" & "*FRC_Classification". Make sure the value of override parameters is correct. Repeat same procedures for Site Area, Site Coverage, Lift Shaft, UFA & FRC.

Make sure areas shown here are defined as UFA, and are not messed up with GFA & FRC Classification. You can select any row, right click and select show to find the area location
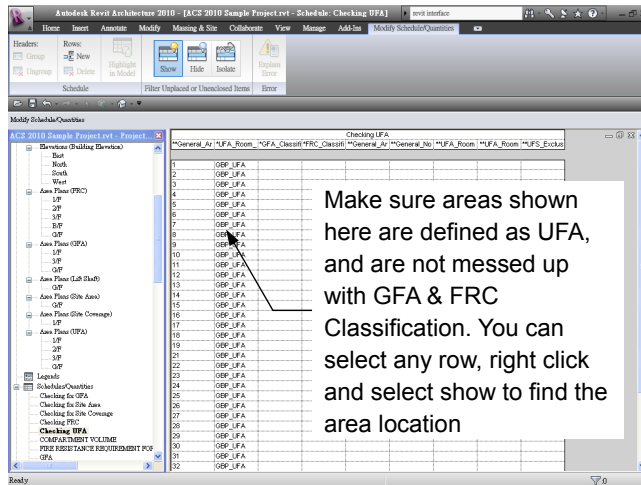
If you want to check the assigned value on plan view, select the area tag, choose "Edit Family" under Modify Area Tags tab. Open the area tag for editing. Select Label under design bar then choose the parameter you wanted to show on plan view.

After checking, you can use the External Tools\GFA, MOE SanFit and FRC Calculation under Add-Ins tab to generate the result.

Refer below section for detail descriptions. Also in certain cases you may need to modify the schedule settings to present the result. Please refer to Appendix B.2.

A sample can be found at a sample located at

C:\Program Files (x86)\ACS@Revit release year\sample project\ACS Sample Project. Lots of useful tips can be found on GFA, UFA and FRC sheets. You can also find another useful sample at C:\Program Files (x86)\ACS@Revit release year \sample project\area breakdown\AB Sample Project.rvt.

4.6.1 GFA Calculation

Results are presented through the tags of site area. Breakdown of GFA & Site Coverage areas are listed automatically under the preset schedules "GFA", "Non-Accountable GFA" & "Site Coverage". If discount in % are all 100%, quantity are all equal to 1, then hide the column accordingly.

A floor summary can be found under preset schedule "GFA Floor Summary". It is a comprehensive summary listing all kind of domestic, non-domestic GFA, dedicated area and concession area floor by floor. Hide schedule columns which are irrelevant to the project. To ensure the results are presented properly, create at least one GFA for

floor with summary to be presented. For example, if there are discountable GFA and lift shaft on 10/F, always create at least one GFA on 10/F as well. You can set the area override to 0 for that area so that it won't have any material effect to GFA calculation.

If GFA group name or GFA Concession group name is assigned, amend Group Name under column header. There are group 1 to 5 preset under Domestic/Non-Domestic GFA, and part of GFA Concession such as plant room, recreation facilities and projections etc. It will be arranged according to alphabetic order. For example, if group names such as "management office", "flat a", "flat c", "flat b" and "(empty group name)" are assigned. It will then be arrange in the order of "(empty group name)", "flat a", "flat b", "flat c" and "management office". The order can also be found under "Non-Accountable GFA Schedule". If no group name is assigned, hide the column. Ungroup column header if

necessary. And if 5 groups are not adequate, add extra group. For detail of adding extra group refer Appendix B2 description on schedule GFA Floor Summary. If it is required to unhide a hidden column, it will be easier to unhide a range of columns nearby, and then move the cursor to the unwanted columns, right click and hide again under "edit schedule".

Amend group name if it is assigned. Otherwise hide it.
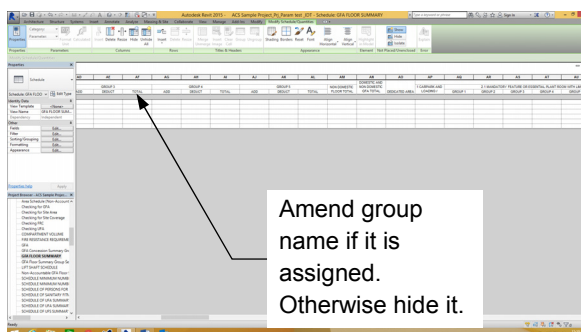
"A Concession Summary" will also be prepared automatically. If more than one type of Non Domestic (ND) GFA exist, i.e. general ND, office and hotel, then you are required to present the "Non-accountable Non Domestic GFA Summary" also.

4.6.2 UFA Calculation

All calculations are presented under the preset schedules. "SCHEDULE OF PERSONS FOR MEANS OF ESCAPE" presents MoE data per room and from here on defined as "level 1 schedule". "UFA FLOOR SUMMARY", "UFA COMPARTMENT SUMMARY" & "UFS GROUP SUMMARY" present total area of each floor, each compartment & each sanitary fitment group respectively and from here on defined as "level 2 schedules". "UFA CAPACITY FLOOR SUMMARY", "UFA CAPACITY COMPARTMENT SUMMARY" & UFS CAPACITY SUMMARY" present total capacity on each floor, each compartment & each sanitary fitment group respectively and from here on defined as "level 3 schedules". "SCHEDULE MINIMUM NUMBER & WIDTH OF EXIT DOOR & EXIT ROUTE FROM EACH FLOOR / COMPARTMENT" & "SCHEDULE OF SANITARY FITMENTS PROVISIONS" present MoE and Sanitary Fitment

statutory requirements and from here on defined as "level 4 schedules". The whole calculation is presented step by step from level 1 to level 4.

You can alter the calculation method for the total number of people under same group. There are two options, "group by group" and "room by room". The setting affects the result. For example, if there are two offices each of 3 sq.m, the total number of people under group by group setting will be equal to roundup of (3+3) / 9 = 1. Or if the setting is changed to room by room, the total number of people will become roundup of 3 / 9 + roundup of 3 / 9 = 2. To switch the calculation method, select External Tools\ACS Calculation Setting under Add-Ins tab.   Change the setting under MoE and Sanfit tab.

If you use group by group setting, you may want to hide MoE room requirements under "SCHEDULE OF PERSONS FOR MEANS OF ESCAPE". Switch the view to the schedule, select edit "formatting" under "property

windows", hide all the fields with name starting with "A_UFA" & "I_UFA".

If you use room by room setting, adopt the following procedures:

1. On Level 1 Schedule of Persons for Means of Escape, turn off calculated total for "area". Turn on calculated total for "room capacity". Also under schedule "sorting/grouping", under "sort by level", turn on footer and show total. So that you can obtain total people number per floor for next round of calculation.

2. On Level 2 schedules, you are not required to present "UFA Floor Summary" as total capacity can be found under level 1 schedule. For UFA Compartment Summary and UFS Group Summary, hide column "area", unhide column "capacity".

3. *No need to present level 3 schedules.*

There are two schedules presenting the

sanitary fitment requirements: "SCHEDULE OF SANITARY FITMENTS PROVISIONS" & "SCHEDULE OF SANITARY FITMENTS PROVISIONS FOR RESIDENTIAL". The first schedule filters to show the use that does not contain "DOMESTIC". It is used to present the requirements for non-domestic use. The second schedule filters to show the use that contains "DOMESTIC". It is used to present the requirements for domestic use. Keep both schedules for composite buildings, otherwise ignore or delete the schedule that is not applicable.

If you have domestic use that provides separate toilets for male and female, such as a dormitory, you are required to change the schedule setting to present the result properly. Turn off the filter for the non-domestic schedule, then under "formatting", unhide the last four fields related to bath.

The preset level 1 to 4 schedules are

capable to present a step by step calculation even for very complicated projects. Some of the schedules may not be required for simple projects.

Default ACS setting provides MoE summary per floor, you can break the floor to several sub zones. This is useful, e.g., when you have several towers on same floor, MoE are independent to each other and you want summary presented per tower. In this case, follow the instruction under classification section to input MoE group name. Then for level 1 to 4 schedules, use MoE group name to sort instead of floor.

Some of the fields under the schedules are outstanding. These includes "room use", "no. and width of exit routes and doors provided", & "no. of sanitary fitments provided". Enter all outstanding fields to finish the schedule. If you have classified a "room" or "area" as single toilet provision, you are also required to provide its use under "SCHEDULE OF SANITARY FITMENTS PROVISIONS".

Starting from 2009, you may use the new MOE input tool to assign exit route provisions of room over a number of areas/rooms simultaneously. Select the areas/rooms representing UFA. Select "External Tools\MOE input tool" under Add-Ins tab, a window will appear.

Auto-Generation of provisions based on MOE min. requirement
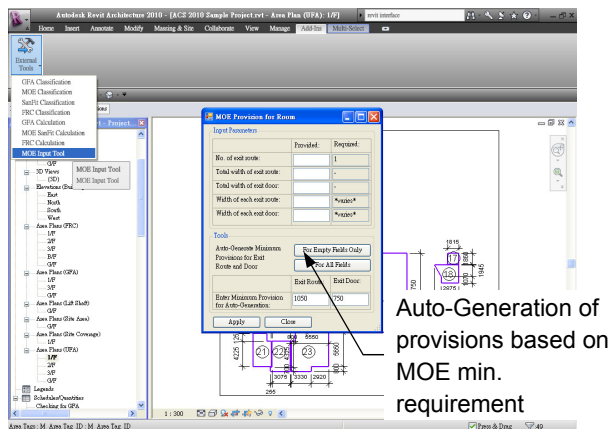
Enter the empty field manually, or use the auto-generation tool. The provisions will then be calculated & assigned based on the MOE minimum requirements together with the minimum width of each exit door / route set at bottom of the window.

4.6.3 FRC Calculation

All calculations are presented under the

preset schedules "COMPARTMENT VOLUME", "COMPARTMENT VOLUME SUMMARY" & "FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION". If you have assigned a "room" or "area" as special hazard area, you are required to provide its class under the schedule "FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION". There are other parameters representing elements of construction that you may want to call in some projects. Refer to Appendix B for description.

If you want to display the area value by tags or schedules, remember to select the parameter named "A_General_Display_Area" instead of "Area". There are discrepancies found in "Area" when exported to Autocad and is rectified in "A_General_Display_Area" provided by ACS.

The final procedure is to setup a sheet by dragging the view of the area plans & schedules to a sheet. Refer to Revit's help for instruction.

5.0 Export to Autocad

5.1 After completing the calculation, you are required to export the Revit file to Autocad for electronic submission, select "Export\Cad Format\DWG" under Application Menu. Select "no overrides" for layers and properties tabs. You can also request Revit to convert all areas to closed polyline during export. Finally follow PNAP 272 to rename the layer name.
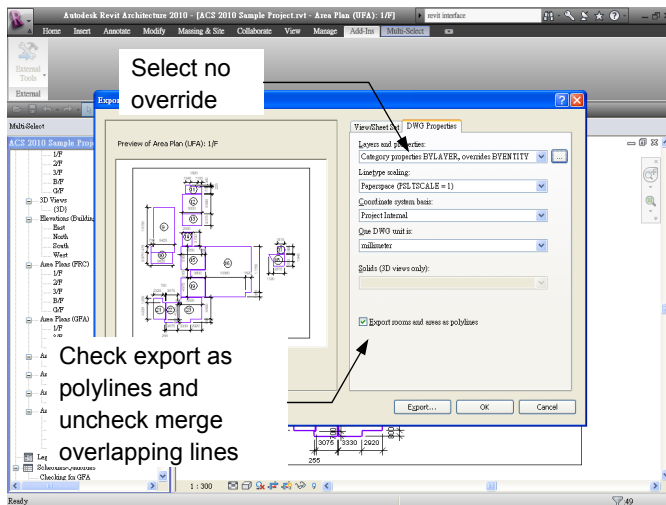
6.0 Other tools

6.1 Upgrade Revit Files

The command upgrades and saves a batch of

Revit files. Select External Tools\Upgrade Revit Files under Add-Ins tab. Select folder containing Revit files. Next then confirm options of upgrade: 1) include files under all subfolders, 2) include read only files, 3) include linked Revit files. For (3), further confirm to include primary linked files or all nested linked files. Select Apply to proceed.

7.0 Troubleshooting

7.1 Manual input required for a few area

In some cases for MOE, Sanfit and FRC calculation, you may want ACS to stop the automatic calculation for a number of areas. Simply leave the area as "unclassified" then ACS will not do the automatic calculation for that particular area. The area will still be listed under the Schedule for MOE, SanFit or FRC Summary and you can enter the data manually.

7.2 Customize GFA Summary

The current version of ACS only supports one level of site coverage calculation. So in some cases you may need to modify the presentation of GFA summary, edit the family

of the GFA summary annotation symbol. You can re-arrange the presentation of the GFA Summary or delete any unwanted calculation. Save the family in another name and reload to your project.

7.3 <u>ACS tools has no response under Revit</u>

By default ACS will be installed under C:\Program Files\. Under a few cases ACS will be installed in another location, e.g. C:\x86\Program Files. In this case the revit addin file is required to update manually. Open the BIT_ACS.addin file. For Windows XP, it is located at C:\Documents and Settings\All Users\Application Data\Autodesk\Revit\Addins \2012\. For Windows Vista and 7, it is located at C:\ProgramData\Autodesk\Revit\Addins \2012\. Find a section in below format:

`<VendorId>BIT1</VendorId>`

The value BIT1 confirms the addin file is generated by for ACS. Next find a section started with `<Assembly>`. You can find a dll path next to it, e.g. C:\Program Files\ACS@Revit 2011\dll\GBP_Classification\GBP_Classificati on.dll. Modify the path to where your ACS dll

files are located. Search the dll file location by windows if necessary.

7.4 <u>Not all ACS tools shown under Revit</u>

Check whether you have started the authorization process by double click the RevitRegister.exe in C:\Program Files\ ACS@Revit release year\Register. If you have started the authorization but still no ACS tools are shown under Revit, check the "revit addin path". For Windows XP, it is located at C:\Documents and Settings\All Users\Application Data\Autodesk\Revit\Addins \2012\. For Windows Vista and 7, it is located at C:\ProgramData\Autodesk\Revit\Addins \2012\. Check if the file BIT_ACS.addin exists. If not then copy and paste the addin file from C:\Program Files\ACS@Revit release year\Addin\BIT_ACS.addin to the "revit addin path". If the file BIT_ACS.addin exists, open the file and find a section in the format of $\langle VendorId \rangle BIT1 \langle /VendorId \rangle$. If the value between $\langle VendorId \rangle$ does not equal to BIT1, copy the addin file from C:\Program Files\ACS@Revit release year\Addin \BIT_ACS.addin. Rename the addin file to

another unique name, e.g. BIT_ACS1.addin, and then paste the file to "revit addin path".

7.5 Error received when running ACS

For project upgraded from previous version of Revit Architecture, you may receive an error message "Object reference not set to an instance of an object.GBP_Calculation " when running ACS auto-calculation. This is because some of the "areas" are corrupted and can't be detected by ACS. You are required to delete the corrupted areas and rebuild them. To find the corrupted areas, select a number of areas and call the ACS classification tool. If there is no response then some of the selected areas are corrupted. Use this principle to find the corrupted areas.

8.0 Support

8.1 If you have any question or suggestion, contact us by sending e-mail to info@bit-world.net.

A Transfer ACS Template Settings

If you start a project without using the ACS Template or if the project is created from previous ACS version, refer to the following paragraphs for transferring the template settings. If you upgrade project from version 2011 or earlier, delete parameter "A_FRC_Volume".

A.1 Transfer Project Parameters, Colour Fill Schemes and Area and Volume Computations

Open the ACS Template. If area breakdown is required and available, select the template ACS Template UFA by Room AB customized under C:\Program Files\ ACS@Revit release year \project template\area breakdown. Otherwise select the template ACS Template UFA by Room under C:\Program Files\ACS@Revit release year\Project Template. Two templates are provided which use "room" and "area" respectively for UFA calculation. Select the one using the same approach as per your original project. Then open your own project. Select "Transfer Project Standards" under Manage tab. and check Project Parameters, Colour Schemes and Area and Volume Computations. If same colour schemes have already been loaded in

the project, cancel the action and reselect Project Parameters and Area and Volume Computations only.

A.2 Transfer Preset Schedules

Select "Insert from File\Insert Views from File "under Insert tab. If area breakdown is required and available, select "AB customized Schedule Views UFA by room / area" under C:\Program Files\ACS@Revit release year\project template\Area Plan and Schedule View File, otherwise select "ACS Area Plan and Schedule View File UFA by room / area" under same location. Select the schedule that is missing in the project.

A.3 Load Area Tag

Select "Load Family" under Insert tab. The area tags can be found under C:\Program Files\ACS@Revit release year\Project Template\Area Tag Family. Select the tag that is missing in the project.

A.4 Confirm ACS Setting

Select External Tools\ACS calculation setting under Add-Ins tab. The tool will appear. Check if all settings are defined properly.

B Introduction of ACS Parameters

B.1 Naming System

There are basically four types of ACS parameters and are described as follows:-

Name of Parameter	Description
Start with one *	Essential Parameter, data must be assigned for ACS to generate the calculation
Start with two *	Override Parameter, data are optional for ACS calculation, and is useful in some situations
Start with "A"	Auto-Generated Parameter, data are automatically generated by ACS
Start with "I"	Input Parameter, data not generated by ACS and manual input is required.

B.2 Description of Parameters under preset schedules

Description of parameters are as follows, refer this table if you want to customize your tag and schedules:-

GFA

Heading	Parameter	Remark

LEVEL	Level	Default set as hidden field
GFA CLASS-FICAT-ION	*GFA_ Classification	Type of GFA, including Domestic, Non-domestic, Office & Hotel. Default set as hidden field. It is used for sorting
AREA ID	**General_Area_ID	
AREA (SQ.M)	A_General_ Display_Area	
DISCO-UNT IN %	**Area_Discount	Area Discount in %, **Hide it if all are 100%.**
DISCO-UNTED AREA (SQ.M)	A_General_ Discounted_Area	= Area x Discount Default set as hidden field.
QTY.	**General_No_of_ Repeated_Flr	Quantity of area, **Hide it if all quantity is 1**
QUANT-TITY X AREA (SQ.M)	A_General_ Multiplied_Area	= Area x Quantity. Default set as hidden field.
QUANT-	A_General_	= Area x Discount in

TITY X DISCO-UNTED AREA (SQ.M)	Multiplied_ Discounted_Area	% x Quantity. **Hide it if all quantity is 1 and all discount % is 100%**

Sorting = LEVEL > GFA CLASSIFICATION > AREA ID

NON-ACCOUNTABLE GFA

Heading	Parameter	Remark
AREA TYPE	A_GFA_Concession _Type	Default set as hidden field. It is used to sort (1) office, (2) hotel, (3) other non-domestic area, (4) domestic area, (5) lift shaft & (6) dedicated area. Sub-total of the six categories will be used for calculation.
LEVEL	Level	Default set as hidden field
AREA ID	**General_Area_ID	
CONCE-SSION	A_GFA_Concession _ID_Classification_	Default set as hidden field.

ID, CLASSI-FICAT-ION & GROUP	Group_Name	Example is 02.2 Mandatory feature….: Transformer Room, where 02.2 is the concession ID defined under PNAP, Mandatory feature…. Is the concession type, Transformer Room is concession sub group. It is used for sorting
CONCE-SSION CLASSI-FICAT-ION & GROUP	A_GFA_Concession _Classification_ Group_Name	Similar to above parameter except without concession ID. A backup parameter for sorting.
CONCE-SSION TYPE	**GFA_Concession _Classification	Similar to above parameter except without group name. A backup parameter for sorting

CONCE-SSION GROUP	**GFA_Concession _Group_Name	Default set as hidden field. Concession Group Name. A backup parameter for sorting.
AREA (SQ.M)	A_General_ Display_Area	
DISCO-UNT IN %	**Area_Discount	Area Discount in %, **Hide it if all are 100%.**
DISCO-UNTED AREA (SQ.M)	A_General_ Discounted_Area	= Area x Discount Default set as hidden field.
QTY.	**General_No_of_ Repeated_Flr	Quantity of area, **Hide it if all quantity is 1**
QUANT-TITY X AREA (SQ.M)	A_General_ Multiplied_Area	= Area x Quantity. Default set as hidden field.
QUANT-TITY X DISCO-UNTED	A_General_ Multiplied_ Discounted_Area	= Area x Discount in % x Quantity. **Hide it if all quantity is 1 and all discount %**

AREA (SQ.M)		**is 100%**

Sorting = AREA TYPE>LEVEL> CONCESSION ID, CLASSIFICATION & GROUP> AREA ID

NON-ACCOUNTABLE NON DOMESTIC GFA SUMMARY

Heading	Parameter	Remark
AREA TYPE	A_GFA_Concession _Type	Default set as hidden field. It is used to sort (1) office, (2) hotel, (3) other non-domestic area.
LEVEL	Level	Default set as hidden field
AREA ID	**General_Area_ID	
CONCE-SSION ID, CLASSI-FICAT-ION & GROUP	A_GFA_Concession _ID_Classification_ Group_Name	Default set as hidden field. Example is 02.2 Mandatory feature….: Transformer Room, where 02.2 is the concession ID

		defined under PNAP, Mandatory feature…. Is the concession type, Transformer Room is concession sub group. It is used for sorting
CONCE-SSION CLASSI-FICAT-ION & GROUP	A_GFA_Concession _Classification_ Group_Name	Similar to above parameter except without concession ID. A backup parameter for sorting.
CONCE-SSION TYPE	**GFA_Concession _Classification	Similar to above parameter except without group name. A backup parameter for sorting
CONCE-SSION GROUP	**GFA_Concession _Group_Name	Default set as hidden field. Concession Group Name. A backup parameter for sorting.

| QUANT-TITY X DISCO-UNTED AREA (SQ.M) | A_General_ Multiplied_ Discounted_Area | = Area x Discount in % x Quantity. **Hide it if all quantity is 1 and all discount % is 100%** |

Sorting = LEVEL> CONCESSION ID, CLASSIFICATION & GROUP> AREA TYPE

GFA Floor Summary

Heading	Parameter	Remark
LEVEL	Level	
AREA WITH FLOOR SUMMARY INFO	A_GFA_Floor_L owest_ID	Auto and Hidden Parameter. It will be set to true if ID of an area is smallest on one level. It will first find the smallest numeric ID. If it doesn't exist, then it will find the ID according to alphabetic order. All floor summary will be presented in such lowest ID

		object.
DOMESTIC GFA, and is broken down in 15 columns	15 parameters, subdivided into 5 groups, each group with: <u>add</u> - A_GFA_Floor_ Summary_GFA_ D _group_X <u>deduct</u> - A_GFA_Floor_S ummary_GFA_ Non_Accountabl e_D _group_X <u>total</u> - A_GFA_Floor_S ummary_GFA_T otal_D _group_X where X = 1 to 5	Total Domestic GFA per floor. It is subdivided under 5 groups, each group with 3 sub columns "add", "deduct" and "total. If extra group is required, follow parameter naming standard, then add group 6, 7, 8…etc.
DOMESTIC FLOOR TOTAL	A_GFA_Floor_S ummary_GFA_T otal_D	Sum of total domestic GFA under different groups.
HOTEL, broken down into 3	<u>add</u> - A_GFA_Floor_ Summary_GFA_	

columns	Hotel deduct - A_GFA_Floor_Summary_GFA_Non_Accountable_Hotel total - A_GFA_Floor_Summary_GFA_Total_Hotel	
OFFICE, broken down into 3 columns	add - A_GFA_Floor_Summary_GFA_Office deduct - A_GFA_Floor_Summary_GFA_Non_Accountable_Office total - A_GFA_Floor_Summary_GFA_Total_Office	
NON-DOMESTIC GFA, and is	15 parameters, subdivided into 5 groups, each	Total Non-Domestic GFA other than office and hotel per

broken down in 15 columns	group with: <u>add</u> - A_GFA_Floor_Summary_GFA_Other_ND_group_X <u>deduct</u> - A_GFA_Floor_Summary_GFA_Non_Accountable_Other_ND_group_X <u>total</u> - A_GFA_Floor_Summary_GFA_Total_Other_ND_group_X where X = 1 to 5	floor. Extra group can be added. Refer above remark under Domestic GFA.
NON DOMESTIC FLOOR TOTAL	A_GFA_Floor_Summary_GFA_Other_ND	Sum of Hotel, Office and other Non-Domestic GFA per floor
DOMESTIC AND NON DOMESTIC GFA TOTAL	A_GFA_Floor_Summary_GFA_Total_D&ND	Sum of Domestic and Non-Domestic GFA

G/F DEDICATED AREA, broken down into 3 columns	add - A_GFA_Floor_ Summary_GFA_ Dedicated_Area _GF deduct - A_GFA_Floor_S ummary_GFA_ Non_Accountabl e_ Dedicated_Area _GF total - A_GFA_Floor_S ummary_GFA_T otal_ Dedicated_Area _GF	
OTHER DEDICATED AREA, broken down into 3 columns	add - A_GFA_Floor_ Summary_GFA_ Dedicated_Area deduct - A_GFA_Floor_S ummary_GFA_ Non_Accountabl	

	e_ Dedicated_Area total - A_GFA_Floor_S ummary_GFA_T otal_ Dedicated_Area	
DOMESTIC GFA CONCESSION, total 37 categories	Parameters start with A_GFA_Floor_S ummary_, follow by description under PNAP-APP151, end with _D	Sub groups are provided for some of the categories such as plant rooms, recreation facilities and projections etc.
NON-DOMESTIC GFA CONCESSION, total 37 categories	Parameter start with A_GFA_Floor_S ummary_, follow by description under PNAP-APP151, end with _ND	

Sorting = LEVEL

CONCESSION SUMMARY

Heading	Parameter	Remark
AREA TYPE	A_GFA_Concession _Type_Simplified	Default set as hidden field. It is used to sort (1) non-domestic and (2) domestic concession area.
CONCE- SSION ID, CLASSI- FICAT- ION- PNAP & GROUP NAME	A_GFA_Concession _ID_Classification_ ModifiedName_ Group_Name	Default set as hidden field. Example is 02.2 Mandatory feature….: Transformer Room, where 02.2 is the concession ID defined under PNAP, Mandatory feature…. Is the concession type, Transformer Room is concession sub group. It is used for sorting
EXEMP- TED AREA	A_General_ Multiplied_ Discounted_	Exempted Area

(SQ.M)	Exempted_Area	
EXEMP-TED AREA SUB-JECT TO 10% OVER-ALL CAP	A_General_ Multiplied_ Discounted_Area _Cap	Exempted Area Subject to Maximum Cap.
EXEMP-TED AREA SUB-JECT TO PNAP APP 151	A_General_ Multiplied_ Discounted_Area _151	Exempted Area Subject to PNAP APP151

Sorting = AREA TYPE> CONCESSION ID, CLASSIFICATION-PNAP & GROUP NAME

Persons for Means of Escape

Heading	Parameter	Remark
LEVEL	Level	Default set as hidden field.
LOCATION	**MOE_Group_ Name	Default set as hidden field. **Turn it on and set as**

		sorting parameter instead of Level if you have assigned MOE Group Name through MOE Classification tool.
COMPART-MENT	**MOE_ Compartment_ Name	Default set as hidden field.
SF MOE CLASSIFI-CATION AND DENSITY FACTOR	A_UFA_SF& MoE_Classifi-cation_&_SF_ Density_Factor	Default set as hidden field.
AREA ID	**General_ Area_ID	
USE	Name	Input figure
UFA (SQ.M)	A_General_ Display_Area	
PERMITTED CAPACITY DENSITY	A_UFA_&_UFS _Combined_ Display_ Capacity_ Density	It is used to display **both** MoE and SF density factor, as MoE and SF density factor are not always

		the same.
ROOM CAPACITY	A_UFA_&_UFS _Combined_ Display_ RoomCapacity	It is used to display **both** MoE and SF capacity, as MoE and SF capacity are not always the same. However, as the parameter value is a text, total capacity cannot be calculated under this parameter. Default set as hidden field. You may consider to unhide it if group by group approach is adopted for MoE and SF calculation.
MOE PERMITTED CAPACITY DENSITY	A_UFA_MOE_ Display_ Capacity_ Density	It is used to display MoE density factor only. Default set as hidden field.
MOE ROOM CAPACITY	A_UFA_MOE_ Display_Room Capacity	Default parameter to display room capacity. The value

		is an integer so total can be calculated. Unhide it if group by group approach adopted for MoE and SF calculation, and MoE requirement per room is not required to present.
SF PERMITTED CAPACITY DENSITY	A_UFA_SanFit_ Display_ Capacity_ Density	It is used to display SF density factor only. Default set as hidden field.
SF ROOM CAPACITY	A_UFA_SanFit_ Display_Room Capacity	Parameter to display SF room capacity, as SF room capacity does not always equal to MoE room capacity. Hide it if both capacity equal each other in project. The value is an integer so total capacity can be

		calculated.
REQ'D MIN. NO. OF EXIT ROUTE	A_UFA_MOE_ Req_Route_ No_per_room	**Set as hidden field if it is not necessary.**
PRO'D MIN. NO. OF EXIT ROUTE	I_UFA_MOE_ Pro_Route_ No_per_room	Input figure
REQ'D MIN. WIDTH OF EXIT DOORS / ROUTE	Parameter name starts with "A_UFA_MOE_ ReqW"	**Set as hidden field if it is not necessary.**
PRO'D MIN. TOTAL WIDTH OF EXIT DOORS / ROUTE	Parameter name starts with "I_UFA_MOE_ ProW"	Input figure
**UFS	**UFS_ Excluded_from _MOE_ Calculation	Default set as hidden field. It is used to filter lobby and pantry which are UFS but not UFA.

Sorting = LEVEL > COMPARTMENT > SF
MOE CLASSIFICATION AND DENSITY
FACTOR > AREA ID

Schedule of Means of Escape per
compartment and per floor are also arranged
similarly.

UFA FLOOR SUMMARY

Heading	Parameter	Remark
LEVEL	Level	Default set as hidden field.
LOCATION	**MOE_Group_ Name	Default set as hidden field. **Turn it on and set as sorting parameter instead of Level if you have assigned MOE Group Name through MOE Classification tool.**
COMPART-MENT	**MOE_ Compartment_ Name	
SF GROUP	A_UFA_SanFit _Group_Use	

MOE CLASSIFI- CATION AND DENSITY FACTOR	A_UFA_MoE_ Classification _&_MoE_ Density_Factor	Default set as hidden field.
AREA (SQ.M)	A_General_ Display_Area	

Sorting = LEVEL > MOE CLASSIFICATION AND DENSITY FACTOR > COMPARTMENT > SF GROUP

UFA COMPARTMENT SUMMARY

Heading	Parameter	Remark
LEVEL	Level	Default set as hidden field.
LOCATION	**MOE_Group_ Name	Default set as hidden field. **Turn it on and set as sorting parameter instead of Level if you have assigned MOE Group Name through MOE Classification tool.**
COMPART-	**MOE_	

MENT	Compartment_ Name	
SF GROUP	A_UFA_SanFit _Group_Use	
MOE CLASSIFI- CATION AND DENSITY FACTOR	A_UFA_MoE_ Classification _&_MoE_ Density_Factor	Default set as hidden field.
AREA (SQ.M)	A_General_ Display_Area	

Sorting = COMPARTMENT > MOE CLASSIFICATION AND DENSITY FACTOR > LEVEL > SF GROUP

UFS FLOOR SUMMARY

Heading	Parameter	Remark
LOCATION	*UFA_SanFit_ Group_Name	Default set as hidden field.
SF MOE CLASSIFI- CATION AND DENSITY FACTOR	A_UFA_SF_&_ MoE_Classif- ication_&_MoE_ Density_Factor	Default set as hidden field.

LEVEL	Level	
MOE ZONING	**MOE_Group_ Name	Default set as hidden field. **Turn it on and set as sorting parameter instead of Level if you have assigned MOE Group Name through MOE Classification tool.**
COMPART- MENT	**MOE_ Compartment_ Name	
AREA (SQ.M)	A_General_ Display_Area	

Sorting = LOCATION > SF MOE CLASSIFICATION AND DENSITY FACTOR > LEVEL > COMPARTMENT

UFA CAPACITY FLOOR SUMMARY

Heading	Parameter	Remark
LEVEL	Level	Default set as hidden field.
LOCATION	**MOE_Group_ Name	Default set as hidden field. **Set as sorting parameter**

		instead of Level if you have assigned MOE Group Name through MOE Classification tool.
USE	*UFA_Room_ Use_Classif- cation	Default set as hidden field.
AREA (SQ.M)	A_General_ Display_Area	
DENSITY FACTOR	A_UFA_ MoE_ Display_ Capacity_ Density	
CAPACITY	A_UFA_total_ capacity_per_ group_per_ classification	

Sorting = LEVEL > USE > DENSITY FACTOR

UFA CAPACITY COMPARTMENT SUMMARY

Heading	Parameter	Remark
LOWEST LEVEL	A_Compart ment_lowest _level	Lowest level of areas under same compartment. Default as hidden

		field. Used for sorting.
COMPART-MENT	**MOE_ Compartment_ Name	Default set as hidden field.
MOE CLASSIFI-CATION AND DENSITY FACTOR	A_UFA_MoE_ Classification _&_MoE_ Density_Factor	Default set as hidden field. Value shows both MoE classification and density factor. Allowed as back up for sorting.
USE	*UFA_Room_ Use_Classif-cation	
AREA (SQ.M)	A_General_ Display_Area	
DENSITY FACTOR	A_UFA_ MoE_ Display_ Capacity_ Density	
CAPACITY	A_UFA_total_ capacity_per_ compartment_per_ classification	

Sorting = LOWEST LEVEL > COMPARTMENT > USE > DENSITY

FACTOR

UFS CAPACITY SUMMARY

Heading	Parameter	Remark
LOWEST LEVEL	A_Group_ lowest _level	Lowest level of areas under same group. Default as hidden field. Used for sorting.
LOCATION	*UFA_SanFit_ Group_Name	Default set as hidden field.
SF USE	A_UFA_SanFit_ Group_Use	Default set as hidden field.
MOE CLASSIFI-CATION AND DENSITY FACTOR	A_UFA_MoE_ Classification _&_MoE_ Density_Factor	Default set as hidden field. Value shows both MoE classification and density factor.
USE	*UFA_Room_ Use_Classif-cation	
AREA (SQ.M)	A_General_ Display_Area	
DENSITY FACTOR	A_UFA_ SanFit_	

	Display_ Capacity_ Density	
CAPACITY	A_UFS_total_ capacity_per_ group_per_ classification	

Sorting = LOWEST LEVEL > LOCATION > SF USE > MOE CLASSIFICATION AND DENSITY FACTOR

Sanitary Fitment Provisions

Heading	Parameter	Remark
A_Group_ lowest_ level	A_Group_ lowest_ level	Default set as hidden field. It is used to sort the schedule according to the level of SF group.
LOCATION	*UFA_SanFit_ Group_Name	
USE	A_UFA_SanFit _Group_Use	
CAPACITY	Parameter starts with "A_UFA_Group	

	_Capacity"	
REQ'D W.C. / BASIN/ URINAL	Parameter starts with "A_UFA_SanFit _Req"	
PRO'D W.C. / BASIN/ URINAL	Parameter starts with "I_UFA_SanFit _Pro"	Input figure
REQ'D BATH	Parameter starts with "A_UFA_SanFit _ReqBath"	Default set as hidden field. **Turn on if necessary. For Unisex bath, turn on male only.**
PRO'D BATH	Parameter starts with "I_UFA_SanFit _ProBath"	Input figure

Sorting = Group lowest level > LOCATION > USE

Compartment Volume

Heading	Parameter	Remark
Level	Level	Default set as hidden field. It is used to sort the

		schedule according to the level of comparment.
FRC Compartment	*FRC_ Compartment _Group_ Name	Compartment Group Name. Default set as hidden field. **Use it for sorting if necessary.**
AREA ID	**General_ Area_ID	
AREA (SQ.M)	A_General_ Display_Area	
HEIGHT (M)	A_FRC_Height	
VOLUME (CU.M)	A_FRC_ Volume	

Sorting = level > AREA ID

Compartment Volume Summary

Heading	Parameter	Remark
Level	Level	
*FRC_ Compartment _Group_ Name	*FRC_ Compartment _Group_ Name	Hidden field. Used for sorting.
AREA ID	**General_ Area_ID	

AREA (SQ.M)	A_General_ Display_Area	
HEIGHT (M)	A_FRC_Height	Hidden field.
VOLUME (CU.M)	A_FRC_ Volume	

Sorting = level > AREA ID

Fire Resistance Requirement

Heading	Parameter	Remark
A_Group_ lowest_ level	A_Group_ lowest_ level	Default set as hidden field. It is used to sort the schedule according to the level of compartment.
COMPART-MENT	*FRC_ Compartment _Group_ Name	
CLASS	A_FRC_ Display_Class	
SIZE	A_FRC_Total _Volume	Compartment size. Either in sq.m or cu.m
FRP REQ'D	A_FRC_FRP_	

	Req	
Requirement on element of construction	Parameter starts with "A_FRC_ ReqThk"	

Sorting = Group lowest level > COMPARTMENT > CLASS

C Solution for deformed area after exported to Autocad

C.1 In Revit previous version polyline may deforms after exported to Autocad when there are loops of area boundary lines within another loop of area boundary lines. This is resolved in current version. However, if this problem still happens you may need to temporary delete the inner / outer loops and export the lines in two separate Autocad files. And then combine the two files in Autocad. If you find that the area is still deformed, draw the polyline directly in Autocad, check the area. And then type such area in Revit under override parameters.

D Area Breakdown

D.1 Setting up

The function of area breakdown can subdivide an "area" into simple geometry, add dimensions and list calculation formulae. By default, dimension created will be offset from the geometry by 0.5m. If you want to change the setting, select "External Tools\ Area Breakdown Setting Up" under Add-Ins tab and change the offset distance.

D.2 <u>Area Breakdown for "area"</u>

To perform area breakdown, select area(s) first, then select "External Tools\ selective orthogonal breakdown" under Add-Ins tab. If you want to select multiple areas, make sure the selected areas belong to the same view plan. And then the programme will cut any selected single loop areas into a nos. of rectangles, add dimensions as much as it can, and perform area breakdown calculation for rectangle, trapezoid, parallelogram, triangle, circle & circle sector. The calculation result can be found under the relevant area schedules. If you have any area that have a loop within another loop, cut that area into single loop by adding area boundaries first.

Check area schedules, see if there is any

empty field under "CALCULATION". Select the empty field, right click and select "show" to switch to the area. If that area is not a simple geometry, select the area first and then select "External Tools\selective triangular breakdown" under Add-Ins tab to cut that area into triangles. Beware, selective triangular breakdown cannot function properly if the subdivided areas are too small, say in 0.01 sq.m. Alternatively you may use "area boundary" to cut the area into simple geometry manually. And if you are required to add dimension for triangle manually, use the following rules: if one of the internal angles is a right angle, add dimensions for the two lines adjoining the right angle; otherwise, add dimension for the longest edge, and then add another dimension from that edge to the opposite point. **Remember to check if all subdivided areas are added after the area breakdown. You may have to add a few areas manually.** If an area is a simple geometry but the formula is not generated, select "External Tools\area breakdown manual input", turn on "manual mode" and enter the breakdown formula and result manually.

D.3 <u>Tag Area</u>

The next step is to attach an area ID tag to the subdivided area. Switch to the relevant view plan, select "Tag All" under Annotate tag. And then select the tag "M_Area Tag_ID".

D.4 <u>Sort Area ID</u>

If you want to assign the area ID automatically, select area(s) first, and then select "External Tools\ sort Area ID" under Add-Ins tab. A window will appear. From which you can select the order to assign Area ID according to the X, Y & Z co-ordinates of the area. For example, if you set the first order as Z in ascending, second order as X in ascending and third order as Y in descending, then the programme will assign the ID of the selected areas incrementally starting from the lowest level, and then for each level the ID will be assigned incrementally starting from upper left corner, from left to right first and then from top to bottom. You can also assign the start no. & select whether you want to assign the ID according to the location point or the corner point of the area.

D.5 <u>Area Breakdown for "room"</u>

For room, automatic calculation is supported

but room breakdown is required to do manually. Cut a room into simple geometry and then use the "External Tools\Area Breakdown Update Calculation" to generate the breakdown formula and result. Prevent cutting a room to a geometry that is too small or too narrow, otherwise Revit will not be able to recognize it as a room.

As the way you break down the room for GBP submission will be different from general design. This means that you are required to create 2 sets of room based on the same Revit model: 1 set for general design plus tender purpose and another set for GBP submission. To do this it is advised to create a separate Revit file links to same Revit model.

D.6 Update calculation of area breakdown

If an "area" or "room" is adjusted but still retain as a simple geometry, i.e. a rectangle, trapezoid, parallelogram, triangle, circle or circle sector, use the "External Tools\Area Breakdown Update Calculation" to update the calculation. If it is no longer a simple geometry then repeat the procedure as stated in section D.1 to D.4 to subdivide it.

D.7 Complete statutory calculation

Refer section "provide essential data" to classify the geometry and finish the statutory calculation.