I have recently completed the measurement of a builder's bill (not SMM) for a project where we were issued with both PDF drawings and an IFC model. We utilise the model to assist us in BQ production but rely on the formal drawn information. I have explored how we can use BIM for BQ/Estimate production on the link below, some features I have considered include:

- The 'automated' take off, how real is this?
- Model Mapping
- Non-modelled items
- BIM for QA
- BIM for Schedules.

Please feel free to follow the link below for more information.

## How we use BIM for BOQ Measurement.



My team has recently completed the measurement of a BOQ for a scheme in Australia. In measuring this we were issued with the PDF tender issue drawings as well as civil, structural, and architectural models. I thought that it was interesting to share how we use BIM and design models to assist us in the preparation of Estimates and BOQ production.

The RICS says that "Building Information Modelling (BIM) can help quantity surveyors to speed up the estimating process by supporting the use of the New Rules of Measurement"<sup>1</sup>. Utilising BIM allows a surveyor to extract quantities from the model and in a sense 'automate' the take-off process. The advantage of utilising BIM for measurement is that the model can become a data hub for building information. The measurements that are traditionally 'taken-off' drawings are already captured within eh Building Information model. Below is an example of the Model Schedule which you can see includes measurements for building elements.

<sup>&</sup>lt;sup>1</sup> Rushton Trevor, BIM is key to future of QS professions says RICS, <u>https://watts.co.uk/bim-is-key-to-future-of-</u> <u>qs-profession-says-rics</u>, Accessed September 2022

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| 0.1          | 310 m <sup>2</sup> |   |             |           | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |
| 0.1          | 20 m <sup>2</sup>  |   |             |           | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |
| 0.1          | 270 m <sup>2</sup> |   |             | MAIN SLAB | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |
| 0.1          | 90 m <sup>2</sup>  |   |             |           | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |
| 0.1          | 60 m <sup>2</sup>  |   |             | MAIN SLAB | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |
| 0.1          | 300 m <sup>2</sup> |   |             | MAIN SLAB | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |
| 0.1          | 670 m <sup>2</sup> |   |             | MAIN SLAB | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |
| 0.1          | 740 m <sup>2</sup> |   |             | MAIN SLAB | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |
| 0.1          | 210 m <sup>2</sup> |   |             | MAIN SLAB | CONCRETE FLOOR SLAB TO ENGINEER'S DRAWING |

## Automatic Measurement

Much is made of BIM's ability to seemingly 'automate' measurement and hence speed up the traditional take off process. However how do we take the above information which lacks specification information, is not sorted for trade for procurement and produce a tool that is useful for tendering and managing a construction project. We do this via a process called 'model mapping'.

Creating a model map is relatively straight forward for a qualified and experienced quantity surveyor. It is a process similar in application to a traditional take-off. The QS looks at the information that has been prepared, the BIM objects in the model, identifies elements that they intend to measure, int the above example this concrete, and maps this achieve an output that is in a format that can be used for tendering. This format might be aligned with the NRM1/ACMM Vol 1 if cost planning or NRM2/A&NZSMM1 if measurement is undertaken for a BOQ. A widely used tool, Costx allows the Surveyor to create 'Dimension Group' for measurement from 2D drawings. The model mapping process allows the Surveyor to create these dimension groups by extracting quantities from objects within the model and mapping them to output dimension groups that are created to align with the required method of measurement. I have included some screen shots of the model mapping process below.

This process is not new and has been considered by industry for a long time. Mitchel Brandtman put out a video of this process on YouTube back in 2012. This is a good example of how utilising a model map and rate library can improve take off processes and worth watching if you are interested. They state it is the "wisdom"<sup>3</sup> behind the model that is important. This is right the model needs to be able to extract the required information whether this be coded into the model or mapped by the surveyor. A link to Mitchel Brandtman's video is here:

## How MB use CostX for 5D BIM (Building Information Modeling) - Mitchell Brandtman - YouTube

This process can allow the Surveyor to utilise the information contained within the model, but it will not allow for items that are not created as objects within the model. For example, taking our

<sup>3</sup> How MB use CostX for 5D BIM (Building Information Modelling),

<sup>&</sup>lt;sup>2</sup> Example Project (Confidential), August 2022, Australia

https://www.youtube.com/watch?v=FHeKpo-YbuQ, Feb 2012, Accessed September 2022.

example of concrete, the A&NZSMM1 requires that a surveyor measure items that are not objects within the model. These items might include items that are workman ship related such as 'scabbling'. The A&NZSMM1 requires that scabbling be measured in area and in length where less than or equal to 250mm wide.



The model in our example does not model these elements and therefore if required the surveyor would need to review the information and measure this out traditionally. Relying therefore on the model to 'automate' the measurement process is to rely solely on a model designer's skill to prepare a capture that captures all required works. This is highly unlikely, and whilst the model mapping process is useful and can speed up the measurement process in our example this will only provide areas of concrete slab. This element of 'take-off' is relatively quick even if undertaken traditionally off A1 drawings. The Surveyor will still need to interrogate the information to ensure that the correct items are captured to suit the level of detail required by the chose SMM for their BoQ.

## Using BIM Models to 'Supplement' Measurement

An alternative approach is to utilised BIM models to supplement the traditional measurement and take off process. This can be where a traditional set of PDF drawings is issued for BOQ production. The team utilises this set for the BoQ measurement, but reference to the BIM Model is used to help the team understand how the building is to be constructed. Form and function can quickly be seen in 3d. Elements such as a steel frame can be more readily understood. Below are some 'snips' taken from our example project which show how much more readily these types of elements can be understood by a surveyor when viewing in 3D as opposed to a 2D plan.

<sup>&</sup>lt;sup>4</sup> AIQS, Australian and New Zealand Standard Method of Measurement of Building Works (A&NZSMM1), 2018 Edition,



A further example of use of the BIM model to supplement the traditional measurement process in in QA and bulk checking. The model includes large broad quantities, and these can be cross checked against the detailed measurement undertaken in the BoQ. A very useful cross check. I find this especially useful when consider items such as Furniture and fittings. These 'layers' of 'object' can be isolated int eh mode and scheduled produced from the model. There are some clear speed advantages here when measuring such items. Below is an extract of doors from the model and as you can see the Model Schedule has already itemised these and the Surveyor's process need now be one of extract, cross check and measure items not models, such as frames (if required) hardware and so on.

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| 458c-bff5-3ee17008a8eb<br>458c-bff5-3ee17008a2e5<br>458c-bff5-3ee17008a2e5   | Existing Fabric He<br>No<br>No   | ader Stroud   Family Hame<br>AP ACCESS PAREL - SINCE DOOR<br>AP ACCESS PAREL - SINCE DOOR<br>AP ACCESS PAREL - SINCE DOOR  | Fire Rating | Frame Reveal Height<br>1763<br>1763   | Frane Sector Type<br>Door Jamb - Steel Frame - Single Swing - Irnulated Door<br>Door Jamb - Steel Frame - Single Swing - Irnulated Door<br>Door Jamb - Steel Frame - Single Swing - Innulated Door<br>Door Jamb - Steel Frame - Single Swing - Innulated Door   | Fran  |
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| 458c-bff5-3ee17008a9eb<br>458c-bff5-3ee17008a95<br>458c-bff5-3ee17008a428<br>458c-bff5-3ee17008a428  | Existing Fabric He<br>No<br>No<br>No<br>No   | ader Stroud   Family Hame<br>AP ACCESS PAREL - SINGLE DOOR<br>AP ACCESS PAREL - SINGLE DOOR   | Fire Rating | Frame Reveal Height<br>1763<br>1763<br>1763<br>1763   | Frame Section Type<br>Door Jamb - Steel Frame - Single Swing - Irsulated Door<br>Door Jamb - Steel Frame - Single Swing - Irsulated Door<br>Door Jamb - Steel Frame - Single Swing - Irsulated Door<br>Door Jamb - Steel Frame - Single Swing - Irsulated Door  | Fran<br>0<br>0<br>0   |
| 458c-bff5-3ee17008a9eb<br>458c-bff5-3ee17008a925<br>458c-bff5-3ee17008a423<br>458d-970-133a9e2b33400   | Existing Fabric He<br>No<br>No<br>No<br>No<br>No   | ader Struck   Family Hame<br>AP ACCESS PAREL - SINALE DOOR<br>AP ACCESS PAREL - SINALE DOOR   | Fire Rating | Frame Reveal Height<br>1763<br>1763<br>1763<br>1763<br>1763   | Frame Section Tope<br>Door Jano - Steel Frame - Snyle Swing - Insulated Door<br>Jano - Steel Frame - Snyle Swing - Insulated Door<br>Door Jano - Steel Frame - Snyle Swing - Insulated Door<br>Door Jano - Steel Frame - Snyle Swing - Insulated Door<br>Door Jano - Steel Frame - Snyle Swing - Insulated Door   | Fran<br>0<br>0<br>0<br>0  |
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| 458c-bff5-3ee17008a9eb<br>458c-bff5-3ee17008a428<br>458c-bff5-3ee17008a428<br>458c-bff5-3ee17008a428<br>4564-97b1-3326e25.034c0<br>416-927b-43701823eec<br>4697-8ec6-0bc72xb94566  | Existing Fabric He<br>No<br>No<br>No<br>No<br>No<br>No<br>No   | ader Stroud   Pamily Name<br>AP ACCESS PAKEL - SINGLE DOOR<br>AP ACCESS PAKEL - SINGLE DOOR<br>AP ACCESS PAKEL - SINGLE DOOR<br>AP ACCESS PAKEL - SINGLE DOOR<br>Double Door Janey Door<br>Double Door Janey Door<br>Double Door Janey Door  | Fire Rating | Frame Reveal Height<br>1763<br>1763<br>1763<br>1763<br>1763<br>2062<br>2062<br>2062<br>2062                         | Frame Section Type<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>MH12-092/4040<br>MH12-092/4040   | Fran<br>0<br>0<br>0<br>0<br>10<br>10  |
| 458-bff5-3ee170083eb<br>458-bff5-3ee17008425<br>458-bff5-3ee17008423<br>456-bff5-3ee17008425<br>4564-5ff5-3ee17008445<br>4564-26-11701825eec<br>4569-429-11701825eec<br>4569-429-11701825eec<br>4569-429-11701825eec   | Existing Pabric He<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No   | ader Stroud Family Name AP ACCESS PAREL - SINALE DOOR Double Doer_Jonery Loor  | Fire Rating | Frame. Reveal Height<br>1763<br>1763<br>1763<br>1763<br>1763<br>2062<br>2062<br>2062<br>2062<br>2062                | Frame Section Troje<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Mel12-692/440<br>Mel12-692/440   | Fran<br>0<br>0<br>0<br>0<br>10<br>10<br>10  |
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| 458- bff5-3ee 17008a8b<br>458- bff5-3ee 17008a2b<br>458- bff5-3ee 17008a2b<br>458- bff5-2ee 17008a4b<br>4564 cfb-28-14708a2b<br>4564 cfb-28-14708a2b<br>4564 cfb-28-14708a2b<br>4564 cfb-2748bc 4768<br>4564 cfb-2748bc 4768<br>4564 cfb-2748bc 4768<br>4564 cfb-2748bc 4768<br>4564 cfb-2748bc 4768<br>4564 cfb-2748bc 4788<br>4564 cfb-2748bc 4788bc   | Existing Pabric He<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No   | ader Shroud Venity Name AP ACCESS PARE SINALE DOOR Double Doer_Jonery Door Penze_Damink Gate-Single  | Fire Rating | Prame Reveal Height<br>1763<br>1763<br>1763<br>1763<br>1763<br>2062<br>2062<br>2062<br>2062<br>2062<br>2062<br>2062 | Frame Section Type<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Mel12-032/44-0<br>Mel12-032/44-0<br>Mel12-032/44-0<br>Mel12-032/44-0<br>Mel12-032/44-0  | Fram<br>0<br>0<br>0<br>10<br>10<br>10<br>10<br>10   |
| 458- cHF5-3ee 17008abb<br>458- cHF5-3ee 17008abb<br>458- cHF5-3ee 17008abb<br>458- cHF5-3ee 17008abb<br>456-473-13701382deec<br>458-430-473542182-437051182deec<br>458-430-4735421474bd156<br>458-430-4735421474bd156<br>458-430-4735421494234b<br>459-548-47333945041   | Existing Fabric He<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No   | ader Stroud Pamily Name AP ACCESS PAKEL - SINGLE DOOR Double Doer_Janery Door  | Fire Rating | Frame Reveal Height<br>1763<br>1763<br>1763<br>1763<br>2062<br>2062<br>2062<br>2062<br>2062<br>2062<br>2062         | Prane Section Type<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Mel 12-052/4040<br>Mel 12-052/4040<br>Mel 12-052/4040<br>Mel 12-052/4040 | Fram<br>0<br>0<br>0<br>10<br>10<br>10<br>10<br>10   |
| 458- bff5-3ee 17008a8b<br>458- bff5-3ee 17008a2b<br>458- bff5-3ee 17008a2b<br>458- bff5-3ee 17008a2b<br>458- d75-3ee 17008a4b<br>456-d76-1708a2be<br>456-d20-47708a2be<br>456-d20-47708a2be<br>456-d20-4778a5b<br>456-d20-4778a5b<br>456-d20-4778a5b<br>456-d20-4778a5b<br>456-d20-4778a5b<br>456-d20-4778a5b<br>456-d20-4778a5b<br>456-d20-4778a5b<br>456-d20-4778a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-478a5b<br>456-d20-47 | Existing         Fabric He           No         No           No         No | ader Shroud Franky Name AP ACCESS PARE SINALE DOOR Double Doer_Jonery Door Poenze_Dhanink Gate-Single Fernez_Dhanink Gate-Single Fernez_Dhanink Gate-Single  | Fire Rating | Prame Reveal Height<br>1763<br>1763<br>1763<br>1763<br>1763<br>2062<br>2062<br>2062<br>2062<br>2062<br>2062<br>2062 | Frame Section Type<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Met12-032/44-0<br>Met12-032/44-0<br>Met12-032/44-0<br>Met12-032/44-0<br>Met12-032/44-0  | Fram<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0 |
| 450- 6475-3ee 17008abb<br>450- 6475-3ee 17008abb<br>450- 6475-3ee 17008abb<br>450-6475-3ee 17008abb<br>450-6475-1-338-283-28-30<br>450-6475-4ee-30-8273054107<br>450-640-6473054105<br>450-640-6473054105<br>450-640-64733094064<br>450-640-647331995064<br>450-640-647331995064<br>450-640-647331995064   | Existing Pabric He<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No   | ader Stroud Pamily Name AP ACCESS PAKEL - SINGLE DOOR Double Doer_Janery Door Penze_Danink Gate Single Penze_Danin | Fre Rabrg   | Prame Reveal Height<br>1763<br>1763<br>1763<br>1763<br>1763<br>1763<br>2062<br>2062<br>2062<br>2062<br>2062<br>2062 | Prime Section Type<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Mel 12-062/4040<br>Mel 12-062/4040<br>Mel 12-062/4040<br>Mel 12-062/4040  | Fram<br>0<br>0<br>0<br>0<br>0<br>10<br>10<br>10<br>10<br>10   |
| 458c-bff5-3ee17008a8bb<br>458c-bff5-3ee17008a8bb<br>458c-bff5-3ee17008a451<br>458c-bff5-3ee17008a451<br>458c-467-3ee1708a456<br>456c-400-4718132eec<br>456c-400-4718454<br>456c-400-4718454<br>456c-400-4718454<br>456c-400-4718454<br>456c-400-4718454<br>456c-400-4718454<br>456c-400-4718454<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-471845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-470845<br>456c-400-400-400-400-400-4                                    | Existing Fabric He No  | ader Shroud Franky Name AP ACCESS PAREL - SINALE DOOR COUGE Door_Jonery Door Dougle Door_Jonery Door Penze_Dannink Gate-Single Pen | Fire Rating | Franc Reveal Height<br>1763<br>1763<br>1763<br>1763<br>2062<br>2062<br>2062<br>2062<br>2062                         | Frame Section Type<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Door Jamb - Steel Frame - Single Siving - Insulated Door<br>Met12-692/44-0<br>Met12-692/44-0<br>Met12-692/44-0<br>Met12-692/44-0<br>Met12-692/44-0  | Fram<br>0<br>0<br>0<br>0<br>10<br>10<br>10<br>10<br>10  |
| 450- 6475-3ee 17008abb<br>540- 6475-3ee 17008abb<br>450- 6475-3ee 17008abb<br>450- 6475-3ee 17008abb<br>450- 6475-13130eb 2034<br>450- 640-64730eb 1701325eec<br>450- 640-64730b 41730b<br>450- 640-64730b 41730b<br>450- 640-647330b 4180<br>446- 640-647330b 4180<br>446- 640-647330b 4180<br>450- 640-473319950b 4<br>450- 640-47340 4<br>450- 640-473319950b 4<br>450- 640-473319950b 4<br>450- 640-473319950b 4<br>450-470-470-470-470-470-470-470-470-470-47  | Existing Fabric He<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No   | ader Stroud Pamily Name AP ACCESS PAKEL - SINGLE DOOR Double Doer_Janery Door Perse_Dannink Gate Single Perse_Dann | Fire Rating | Prane Reveal Height<br>1783<br>1783<br>1783<br>1783<br>1783<br>1783<br>1783<br>1783                                 | Prime Section Type<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Door Jamb - Steel Frame - Single Swing - Insulated Door<br>Mell 2-062/4040<br>Mell 2-062/4040<br>Mell 2-062/4040<br>Mell 2-062/4040  | Fram<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0 |
| 456- 6H5-3ee 1700848eb<br>456- 6H5-3ee 17008478<br>456- 6H5-3ee 17008478<br>456- 6H5-3ee 17008478<br>456- 6H5-3ee 17008478<br>456- 640-477018266<br>456- 640-647304565<br>455- 648-4723199580e<br>455- 648-4723199580e<br>455- 648-4723199580e<br>455- 648-4723199580e<br>455- 648-4723199580e<br>455- 648-4723199580e   | Existing Fabric He<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No<br>No   | ader Shroud Franky Name AP ACCESS PAREL - SINALE DOOR Double Doer_Jonery Door Penze_Dhanink Gate Single Pe | Fire Rating | Prane Reveal Height<br>1783<br>1783<br>1783<br>1783<br>1783<br>1783<br>1783<br>1783                                 | Frame Section Type<br>Door Jamb - Steel Frame - Single Sining - Insulated Door<br>Door Jamb - Steel Frame - Single Sining - Insulated Door<br>Door Jamb - Steel Frame - Single Sining - Insulated Door<br>Door Jamb - Steel Frame - Single Sining - Insulated Door<br>Met12-692/44-00<br>Met12-692/44-00<br>Met12-692/44-00<br>Met12-692/44-00<br>Met12-692/44-00                                     | Fram<br>0<br>0<br>0<br>10<br>10<br>10<br>10<br>10   |

<sup>5</sup> Example Project (Confidential), August 2022, Australia

<sup>6</sup> Example Project (Confidential), August 2022, Australia