

Appendix A-1

Structural Engineers Report
for
City of Vincent
Administration & Civic Centre

Structerre reference number: S870561

30 January 2018

The Manager
City Of Vincent
244 Vincent Street
LEEDERVILLE WA 6007

Attn: James Hopper

Dear Manager

**SOLAR PANEL INSTALLATION
AT
ADMINISTRATION AND CIVIC CENTRE - #244 VINCENT ST LEEDERVILLE**

In response to your recent request, a representative from this Office visited the above-mentioned site on 30 January 2018.

1. PURPOSE

The purpose of the visit was to inspect the structural steelwork of the existing building and comment upon its structural adequacy to support the proposed solar panels.

2. OBSERVATIONS

Information provided by you via email indicated that solar panels were to be fixed on the roof of the building, as shown on the below outlined in red in Figure 1. It can be seen that solar panels are to be installed over the roof.

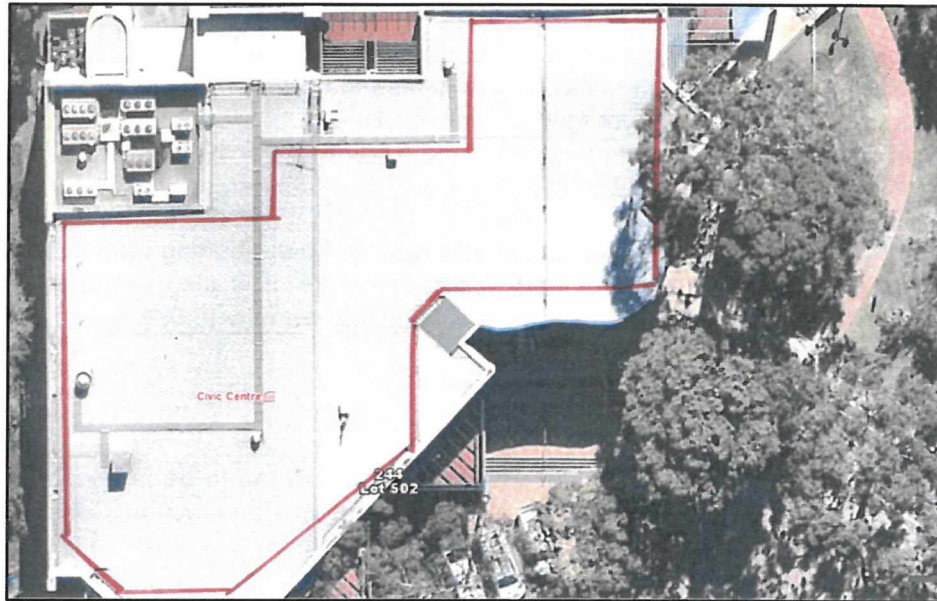


Figure 1

Proposed solar panel layout provided to this Office.

Typically solar panels will impose an additional loading of less than 0.15kPa over the roof area to which they will be installed. If panels are to be installed that will impose a weight greater than 0.15kPa, refer back to this Office.

The panels are to be fixed to the roof with a proprietary panel mounting system. The panel mounting system is to be fixed in accordance with the manufacturer's specifications.

Refer to the attached Site Notes & Measurements document, which outlines the construction of the building inspected.

The purlin gauges could not be determined on site. The client supplied engineering drawings to this office. Figures 2 and 3 refer to the engineering drawings and the associated member schedule respectively.

3. COMMENTS & RECOMMENDATIONS

Engineering drawings supplied to this office along with the findings during the inspection indicated that Lysaght Z200.24 purlins were utilised.

A review of the manufacturer's design tables revealed that the purlins have adequate strength to support the additional loads of the solar panel installation.

The panels are to be installed supported on proprietary brackets. These brackets are to be fixed in strict accordance with the manufacturer's specifications.

All fixings for the solar panels and supporting elements are to be installed in accordance with the manufacturer's specifications.

The existing supporting structures were also considered to have adequate capacity to support the additional loads of the solar panels. This assessment is formed on the basis that the additional 0.15kPa loading from the solar panels is less than the minimum design imposed load required for a roof designed in accordance with Table 3.2 of *Australian Standard 1170.1 – Structural Design Actions*. The recent inspection indicated that the existing supporting structures have been designed in accordance with relevant Australian Standards.

It is to be noted that our certification is for the strength of the supporting structure and does not comment on the strength of the proprietary fixing elements. It is also assumed that the roof sheeting has been fixed in accordance with the sheeting manufacturer's specifications and is structurally adequate.

4. APPLICABLE STANDARDS

The recommendations provided within this Report are considered to be in accordance with the intent of the relevant Australian Standards and the National Construction Code (NCC); these include but are not limited to the following:

- NCC Volume One
- Australian Standard 4100 – Steel structures
- Australian Standard 4600 – Cold-formed steel structures
- Australian Standard 1170.1 – Permanent, imposed and other actions
- Australian Standard 1170.2 – Wind actions

5. CONCLUSION

It is considered that the existing building has adequate capacity to support the installation of the nominated areas of solar panels, still with an acceptable safety factor. As such, the building is considered suitable to support the installation of the solar panels.

Thank you for the opportunity to assist you in this matter. If this Office can be of further assistance, please do not hesitate to contact us again.

Yours faithfully



Darren Kenneally
 Structural Engineer
 BEng (Hons.) MEng

Authorisation

Report reviewed and authorised for release



Shane Just
 Division Manager
 BE (Civil/Structural), MIEAust

Enclosed:

Figures 1 - 3

Site Notes & Measurements

Disclaimer:

This report is at the request of the addressee for submission to Council and no liability is accepted by StrucTerre Consulting Engineers to any other person reading or relying upon the report, not withstanding any rule of law and/or equity to the contrary, and that this report is strictly confidential and intended to be read and relied upon only by the addressee, and the Council.

Job #	Revision	Authored	Checked	Authorised
S870561	0	DKE	SG	SJU

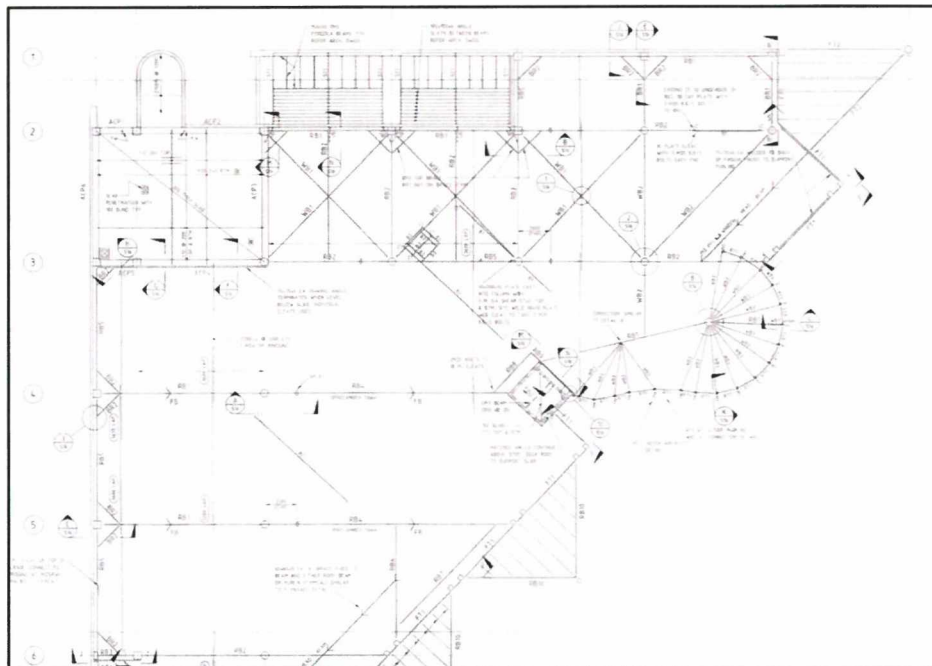


Figure 2 Engineering drawings for the library (supplied by the client)

MEMBER SCHEDULE		
MARK No	SIZE	COMMENTS
RB1	360 UB 44	BOLT TO SIDE OF LIFT SHAFT
RB2	250 UB 26	
RB3	150 PFC	
RB4	360 UB 50	
RB5	310 UB 32	
RB7	200 UB 22	
RB8	150 PFC	
RB9	150 PFC	
RB10	200 PFC	
RT1	75x75x6 EA	
BR1	125 SHS 4.0	SEE DETAIL 10 PLATE TOP CAP PLATE, 2-M20 8.8/S BOLTS
BR2	48 CHS 3.2	
BR3	100x10 PLATE	
WB1	100x100x6 EA	
WB2	114 CHS 4.8	
WB3	75x75x6 EA	
M1	CASTELLATED SECTION	
C1	75x75x4.0 SHS	
B1	200 UB 25	
B2	360 UB 45	
B3	150 PFC	
ST1	150x100x5 RHS	
UB	100x4.8 CHS	

Figure 3 Member schedule for the library (supplied by the client)

SITE NOTES AND MEASUREMENTS

BUILDING INSPECTED:	
Roof Cladding	Metal
Roof Construction	UB portals with z section purlins
Building width	~ 43000mm
Wall Type	Masonry walls
Main Roof Beams	360 UB at 9600mm centres spanning ~ 14000mm
Purlins	Z200.24 at 1200mm centres spanning ~ 9600mm
Purlin-to-Beam Fixing	Cleat and bolt
Bridging	Mid-span
Comments	
Building Elevation	
Roof Construction	

Appendix A-2

Structural Engineers Report
for
City of Vincent
Beatty Park Leisure Centre

Structerre reference number: S870550

30 January 2018

The Manager
City Of Vincent
244 Vincent Street
LEEDERVILLE WA 6007

Attn: James Hopper

Dear Manager

**SOLAR PANEL INSTALLATION
AT
BEATTY PARK LEISURE CENTRE - #220 VINCENT ST NORTH PERTH**

In response to your recent request, a representative from this Office visited the above-mentioned site on 30 January 2018.

1. PURPOSE

The purpose of the visit was to inspect the structural steelwork of the existing building and comment upon its structural adequacy to support the proposed solar panels.

2. OBSERVATIONS

Information provided by you via email indicated that solar panels were to be fixed on the roof of the building, as shown on the below Figure 1. It can be seen that solar panels are to be installed over two sections of roof (Section 1 and Section 2),



Figure 1

Proposed solar panel locations provided to this Office.

Typically solar panels will impose an additional loading of less than 0.15kPa over the roof area to which they will be installed. If panels are to be installed that will impose a weight greater than 0.15kPa, refer back to this Office.

The panels are to be fixed to the roof with a proprietary panel mounting system. The panel mounting system is to be fixed in accordance with the manufacturer's specifications.

Refer to the attached Site Notes & Measurements document, which outlines the construction of the building inspected. All observations were undertaken from ground level.

3. COMMENTS & RECOMMENDATIONS

Engineering drawings previously supplied to this office along with the findings during the inspection indicated that the Lysaght Z150.19 for Section 1 and Z200.15 for Section 2.

A review of the manufacturer's design tables revealed that the purlins have adequate strength to support the additional loads of the solar panel installation.

The panels are to be installed supported on proprietary brackets. These brackets are to be fixed in strict accordance with the manufacturer's specifications.

All fixings for the solar panels and supporting elements are to be installed in accordance with the manufacturer's specifications.

The existing supporting structures were also considered to have adequate capacity to support the additional loads of the solar panels. This assessment is formed on the basis that the additional 0.15kPa loading from the solar panels is less than the minimum design imposed load required for a roof designed in accordance with Table 3.2 of *Australian Standard 1170.1 – Structural Design Actions*. The recent inspection indicated that the existing supporting structures have been designed in accordance with relevant Australian Standards.

It is to be noted that our certification is for the strength of the supporting structure and does not comment on the strength of the proprietary fixing elements. It is also assumed that the roof sheeting has been fixed in accordance with the sheeting manufacturer's specifications and is structurally adequate.

4. APPLICABLE STANDARDS

The recommendations provided within this Report are considered to be in accordance with the intent of the relevant Australian Standards and the National Construction Code (NCC); these include but are not limited to the following:

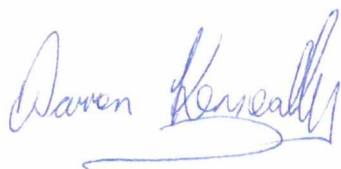
- NCC Volume One
- Australian Standard 4100 – Steel structures
- Australian Standard 4600 – Cold-formed steel structures
- Australian Standard 1170.1 – Permanent, imposed and other actions
- Australian Standard 1170.2 – Wind actions

5. CONCLUSION

It is considered that the existing building (Section 1 and Section 2) has adequate capacity to support the installation of the nominated areas of solar panels, still with an acceptable safety factor. As such, the building is considered suitable to support the installation of the solar panels.

Thank you for the opportunity to assist you in this matter. If this Office can be of further assistance, please do not hesitate to contact us again.

Yours faithfully



Darren Kenneally
 BEng (Hons.) MEng

Authorisation

Report reviewed and authorised for release



Shane Just
 Division Manager
 BE (Civil/Structural), MIEAust

Enclosed:
Site Notes & Measurements

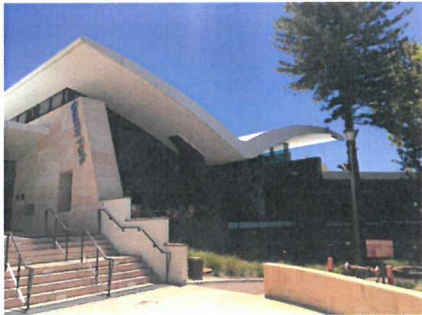
Disclaimer:
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Job #	Revision	Authored	Checked	Authorised
S870550	0	DKE	SG	SJU

SITE NOTES AND MEASUREMENTS

BUILDING INSPECTED: Section 1	
Roof Cladding	Metal
Roof Construction	310 UB supported on 90 SHS and equal angle sitting on masonry wall with Z section purlins over
Building width	~ 8700mm
Wall Type	Masonry wall
Main Roof Beams	310 UB spanning ~ 2000mm
Purlins	Z150.19 at 1200mm centres spanning ~6000mm
Purlin-to-Beam Fixing	Cleat and bolt
Bridging	Mid-span
Comments	
Building Elevation	
Roof Construction	

SITE NOTES AND MEASUREMENTS

BUILDING INSPECTED: Section 2	
Roof Cladding	Metal
Roof Construction	UB portals with Z section purlins over
Building width	~ 32000mm
Wall Type	Concrete panels and glass
Main Roof Beams	460 UB spanning ~ 11000mm at 8100mm centres
Purlins	Z200.15 at 1200mm centres spanning 8100mm
Purlin-to-Beam Fixing	Cleat and bolt
Bridging	Mid-span
Comments	
Building Elevation	
Roof Construction	

Appendix A-3

Structural Engineers Report
for
City of Vincent Library

Structerre reference number: S870551

30 January 2018

The Manager
City Of Vincent
244 Vincent Street
LEEDERVILLE WA 6007

Attn: James Hopper

Dear Manager

**SOLAR PANEL INSTALLATION
AT
LOFTUS CENTRE - #99 LOFTUS ST LEEDERVILLE**

In response to your recent request, a representative from this Office visited the above-mentioned site on 30 January 2018.

1. PURPOSE

The purpose of the visit was to inspect the structural steelwork of the existing building and comment upon its structural adequacy to support the proposed solar panels.

2. OBSERVATIONS

Information provided by you via email indicated that solar panels were to be fixed on the roof of the building, as shown on the below outlined in red in Figure 1. It can be seen that solar panels are to be installed over the roof.

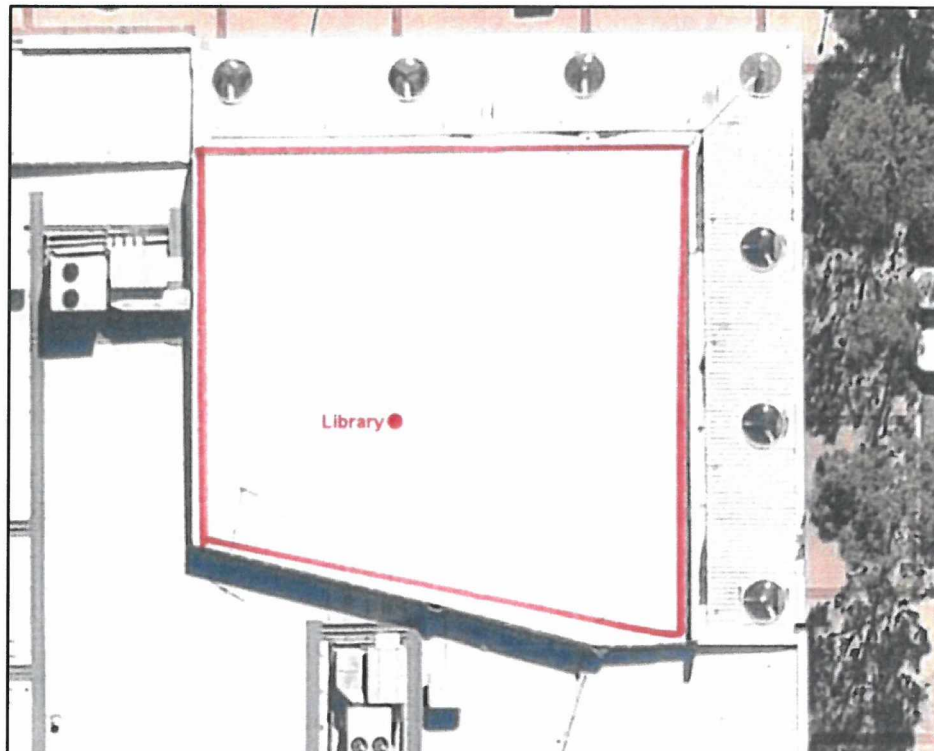


Figure 1

Proposed solar panel layout provided to this Office.

Typically solar panels will impose an additional loading of less than 0.15kPa over the roof area to which they will be installed. If panels are to be installed that will impose a weight greater than 0.15kPa, refer back to this Office.

The panels are to be fixed to the roof with a proprietary panel mounting system. The panel mounting system is to be fixed in accordance with the manufacturer's specifications.

Refer to the attached Site Notes & Measurements document, which outlines the construction of the building inspected.

The roof members could not be determined on site as it was a flat roof with a lined ceiling. The client supplied engineering drawings to this office. Figures 2 and 3 refer to the engineering drawings and the associated member schedule respectively.

3. COMMENTS & RECOMMENDATIONS

Engineering drawings supplied to this office indicated that Lysaght Z200.19 purlins were utilised.

A review of the manufacturer's design tables revealed that the purlins have adequate strength to support the additional loads of the solar panel installation.

The panels are to be installed supported on proprietary brackets. These brackets are to be fixed in strict accordance with the manufacturer's specifications.

All fixings for the solar panels and supporting elements are to be installed in accordance with the manufacturer's specifications.

The existing supporting structures were also considered to have adequate capacity to support the additional loads of the solar panels. This assessment is formed on the basis that the additional 0.15kPa loading from the solar panels is less than the minimum design imposed load required for a roof designed in accordance with Table 3.2 of *Australian Standard 1170.1 – Structural Design Actions*. The recent inspection indicated that the existing supporting structures have been designed in accordance with relevant Australian Standards.

It is to be noted that our certification is for the strength of the supporting structure and does not comment on the strength of the proprietary fixing elements. It is also assumed that the roof sheeting has been fixed in accordance with the sheeting manufacturer's specifications and is structurally adequate.

4. APPLICABLE STANDARDS

The recommendations provided within this Report are considered to be in accordance with the intent of the relevant Australian Standards and the National Construction Code (NCC); these include but are not limited to the following:

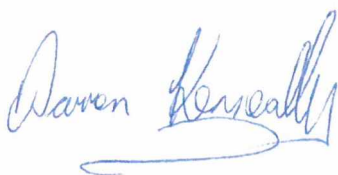
- NCC Volume One
- Australian Standard 4100 – Steel structures
- Australian Standard 4600 – Cold-formed steel structures
- Australian Standard 1170.1 – Permanent, imposed and other actions
- Australian Standard 1170.2 – Wind actions

5. CONCLUSION

It is considered that the existing building has adequate capacity to support the installation of the nominated areas of solar panels, still with an acceptable safety factor. As such, the building is considered suitable to support the installation of the solar panels.

Thank you for the opportunity to assist you in this matter. If this Office can be of further assistance, please do not hesitate to contact us again.

Yours faithfully



Darren Kenneally
 Structural Engineer
 BEng (Hons.) MEng

Authorisation
 Report reviewed and authorised for release



Shane Just
 Division Manager
 BE (Civil/Structural), MIEAust

Enclosed:
Figures 1 - 3
Site Notes & Measurements

Disclaimer:
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Job #	Revision	Authored	Checked	Authorised
S870551	0	DKE	SG	SJU

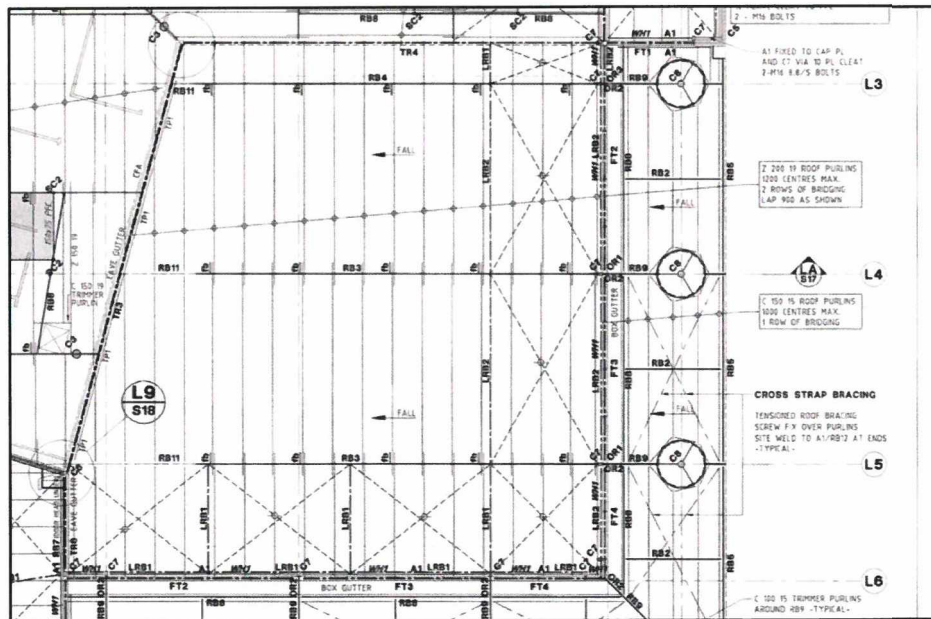


Figure 2 Engineering drawings for the library (supplied by the client)

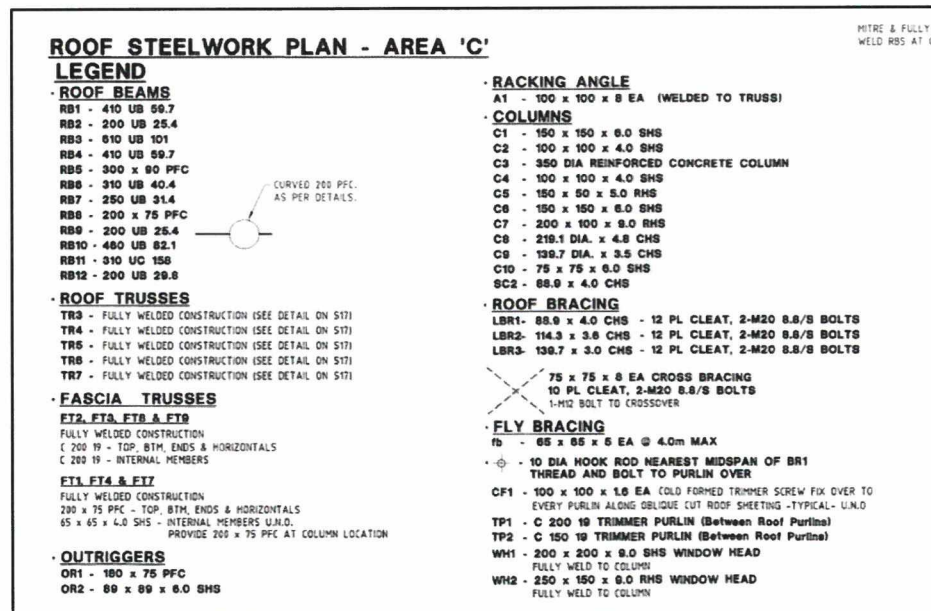


Figure 3 Member schedule for the library (supplied by the client)

SITE NOTES AND MEASUREMENTS

BUILDING INSPECTED:	
Roof Cladding	Metal
Roof Construction	UB portals with z section purlins
Building width	~ 22000mm for library section of building
Wall Type	Steel walls
Main Roof Beams	UB (Varied sizes as per the engineering supplied to this office) at ~8000mm
Purlins	Z200.19 at 1200mm centres spanning ~ 8000mm
Purlin-to-Beam Fixing	Cleat and bolt
Bridging	2 rows
Comments	
Building Elevation	
Roof Construction	Roof construction not visible as it was a flat roof

Appendix A-4

Structural Engineers Report
for
City of Vincent
Works Depot

Structerre reference number: S870552

30 January 2018

The Manager
City Of Vincent
244 Vincent Street
LEEDERVILLE WA 6007

Attn: James Hopper

Dear Manager

**SOLAR PANEL INSTALLATION
AT
WORKS DEPOT OFFICE - #1 LINWOOD CT OSBORNE PARK**

In response to your recent request, a representative from this Office visited the above-mentioned site on 30 January 2018.

1. PURPOSE

The purpose of the visit was to inspect the structural steelwork of the existing building and comment upon its structural adequacy to support the proposed solar panels.

2. OBSERVATIONS

Information provided by you via email indicated that solar panels were to be fixed on the roof of the building, as shown on the below outlined in red in Figure 1. It can be seen that solar panels are to be installed over Section 1 and Section 2 of the roof.

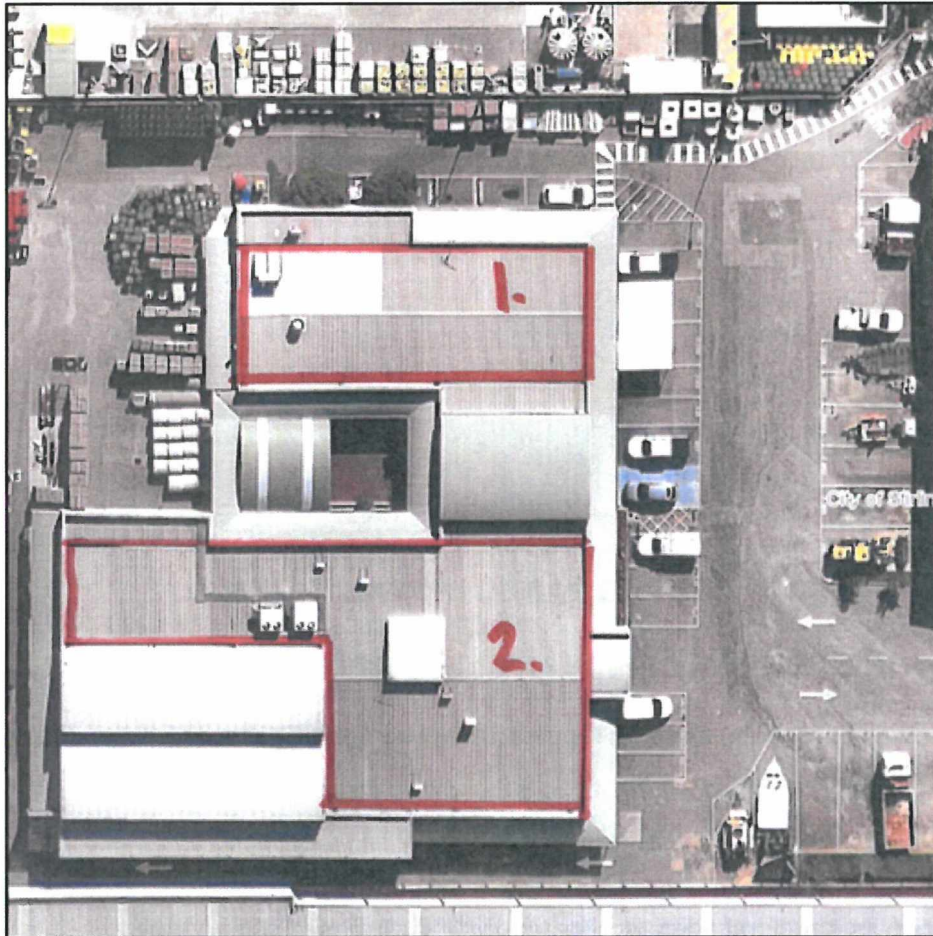


Figure 1

Proposed solar panel layout provided to this Office.

Typically solar panels will impose an additional loading of less than 0.15kPa over the roof area to which they will be installed. If panels are to be installed that will impose a weight greater than 0.15kPa, refer back to this Office.

The panels are to be fixed to the roof with a proprietary panel mounting system. The panel mounting system is to be fixed in accordance with the manufacturer's specifications.

Refer to the attached Site Notes & Measurements document, which outlines the construction of the building inspected.

3. COMMENTS & RECOMMENDATIONS

The gauge of the purlins could not be determined on site. For the purpose of this report and the associated desktop study, it was assumed that the purlins were Lysaght Z150.19 for both Section 1 and Section 2. It is recommended that the thickness of the steel to the purlins is confirmed to be a minimum of 1.9mm by removing roof cladding/ceiling lining or structural drawings prior to proceeding.

A review of the manufacturer's design tables revealed that the purlins have adequate strength to support the additional loads of the solar panel installation.

The panels are to be installed supported on proprietary brackets. These brackets are to be fixed in strict accordance with the manufacturer's specifications.

All fixings for the solar panels and supporting elements are to be installed in accordance with the manufacturer's specifications.

The existing supporting structures were also considered to have adequate capacity to support the additional loads of the solar panels. This assessment is formed on the basis that the additional 0.11kPa loading from the solar panels is less than the minimum design imposed load required for a roof designed in accordance with Table 3.2 of *Australian Standard 1170.1 – Structural Design Actions*. The recent inspection indicated that the existing supporting structures have been designed in accordance with relevant Australian Standards.

It is to be noted that our certification is for the strength of the supporting structure and does not comment on the strength of the proprietary fixing elements. It is also assumed that the roof sheeting has been fixed in accordance with the sheeting manufacturer's specifications and is structurally adequate.

4. APPLICABLE STANDARDS

The recommendations provided within this Report are considered to be in accordance with the intent of the relevant Australian Standards and the National Construction Code (NCC), these include but are not limited to the following:

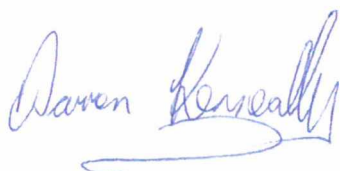
- NCC Volume One
- Australian Standard 4100 – Steel structures
- Australian Standard 4600 – Cold-formed steel structures
- Australian Standard 1170.1 – Permanent, imposed and other actions
- Australian Standard 1170.2 – Wind actions

5. CONCLUSION

It is considered that the existing building (Section 1 and Section 2) has adequate capacity to support the installation of the nominated areas of solar panels, still with an acceptable safety factor. As such, the building is considered suitable to support the installation of the solar panels.

Thank you for the opportunity to assist you in this matter. If this Office can be of further assistance, please do not hesitate to contact us again.

Yours faithfully



Darren Kenneally
 Structural Engineer
 BEng (Hons.) MEng

Authorisation

Report reviewed and authorised for release



Shane Just
 Division Manager
 BE (Civil/Structural), MIEAust

Enclosed:

Site Notes & Measurements for Section 1
Site Notes & Measurements for Section 2

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Job #	Revision	Authored	Checked	Authorised
S870552	0	DKE	SG	SJU

SITE NOTES AND MEASUREMENTS

BUILDING INSPECTED: Section 1	
Roof Cladding	Metal
Roof Construction	UB portals with z section purlins
Building width	~ 12000mm
Wall Type	Masonry walls
Main Roof Beams	310 UB at 7400mm centres spanning ~ 14500mm
Purlins	Z150.19 at 1300mm centres spanning ~ 7400mm
Purlin-to-Beam Fixing	Cleat and bolt
Bridging	Mid-span
Comments	
Building Elevation	
Roof Construction	

SITE NOTES AND MEASUREMENTS

BUILDING INSPECTED: Section 2	
Roof Cladding	Metal
Roof Construction	PFC sections with z section purlins
Building width	~ 22000mm
Wall Type	Masonry walls
Main Roof Beams	180 PFC at 7100mm centres spanning ~ 7100mm
Purlins	Z150.19 at 1500mm centres spanning ~ 7100mm
Purlin-to-Beam Fixing	Cleat and bolt
Bridging	Mis-span
Comments	
Building Elevation	
Roof Construction	