

Before an Independent Hearings Panel  
Appointed by Christchurch City Council

---

*under:* the Resource Management Act 1991

*in the matter of:* proposed Plan Change 14 to the Christchurch District  
Plan

*and:* **Church Property Trustees**  
(Submitter 825)

Statement of evidence of Peter Carney on behalf of Church  
Property Trustees (Structural Engineering)

---

Dated: 20 September 2023

---

Reference: Jo Appleyard (jo.appleyard@chapmantripp.com)  
Annabel Hawkins (annabel.hawkins@chapmantripp.com)

chapmantripp.com  
T +64 3 353 4130  
F +64 4 472 7111

PO Box 2510  
Christchurch 8140  
New Zealand

Auckland  
Wellington  
Christchurch



## **STATEMENT OF EVIDENCE OF PETER CARNEY ON BEHALF OF CHURCH PROPERTY TRUSTEES**

### **INTRODUCTION**

- 1 My full name is Peter Edward Carney.
- 2 I hold a Bachelor's of Science and Master's of Science in Engineering from the University of Washington in Seattle (United States of America).
- 3 I am the Structures Manager for the Christchurch office of Holmes NZ LP, a role I have held since 2022. My previous role was as a Project Director at Holmes.
- 4 I have 15 years' experience in the structural engineering field. Relevant to this evidence, I have worked on and led a number of heritage strengthening and restoration projects, including the St. Mary's Church (Timaru), Hawke's Bay Opera House, Hastings Municipal Building, the Arts Centre of Christchurch, and Christ Church Cathedral.

### **CODE OF CONDUCT**

- 5 While this is not an Environment Court hearing, I note that in preparing my evidence I have reviewed the Code of Conduct for Expert Witnesses contained in Part 9 of the Environment Court Practice Note 2023. I have complied with it in preparing my evidence. I confirm that the issues addressed in this statement of evidence are within my area of expertise, except where I state that I am relying on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

### **SCOPE OF EVIDENCE**

- 6 My evidence will address the following:
  - 6.1 My comments on the Aurecon Group (*Aurecon*) 2011 strengthening scheme; and
  - 6.2 My comments on the evidence of Clara Caponi for the Council.
- 7 In preparing this evidence I have:
  - 7.1 Reviewed the evidence of Clara Caponi for the Council as relating to the St. James Riccarton Church; and
  - 7.2 Carried out a high-level desktop review of the following documents prepared by Aurecon:

- (a) St. James Riccarton, Strength & Repair Assessment for Godfrey & Company (*Strength and Repair Assessment*);<sup>1</sup>
- (b) St. James Church Re-Strengthening drawings (*Re-Strengthening drawings*).<sup>2</sup>

### **COMMENTS ON AURECON STRENGTHENING SCHEME**

- 8 I have carried out a high-level review of Aurecon's Strength and Repair Assessment and Re-Strengthening Drawings only. I note that in the time available I have not yet visited the site and am only familiar with the building through the photographs provided in the Strength and Repair Assessment.
- 9 My suggested amendments/additions to Aurecon's strengthening scheme are based on my past experience with buildings similar to the St. James Church (i.e. unreinforced masonry/concrete buildings with timber roofs).
- 10 The document attached to my evidence as **Appendix 1** outlines the amendments/additions to the Aurecon strengthening scheme I see as being required to achieve a seismic capacity of 67% NBS IL2.
- 11 The primary addition I recommend to the Aurecon strengthening scheme involves work to connect perimeter walls into the existing roof structure and, where required, strengthen that roof structure to resist anticipated loads.
- 12 The Aurecon Strength & Repair Assessment makes no mention of the church's foundation performance forming part of the assessment. The scope of work listed in Aurecon's report includes the provision of a "Concept strengthening design if the building proves to be earthquake prone". It is not unusual for a concept scheme to be completed without the completion of geotechnical investigations that allow for structural assessment of foundation performance. However, I would typically note this as a risk to clients and, should a strengthening project proceed, recommend geotechnical investigations be completed, foundation performance assessed, and, if foundation performance issues are identified, design for appropriate strengthening. In the context of the current discussion regarding the St. James Church, I note foundation performance as a risk item that could potentially result in higher strengthening costs.

---

<sup>1</sup> Aurecon *St. James Riccarton, Strength & Repair Assessment for Godfrey & Company* (03 August 2011).

<sup>2</sup> Aurecon *St. James Church Re-Strengthening drawings* (28 July 2011).

### COMMENTS ON THE ENGINEERING EVIDENCE OF MS CAPONI

- 13 My main takeaway from Ms Caponi's evidence lies in her Conclusion, which reads:

*There are viable engineering options available to repair the building to a safe and useable condition.*

- 14 I do not disagree – there are viable engineering options available. However, in my opinion Aurecon's previous scheme, which I understand is the basis of the Council's current evidence and cost estimate, does not achieve the level of strength required due to inadequate strength in the roof diaphragm and its connections to perimeter walls.

- 15 Ms Caponi's evidence also talks about strengthening and changing the use of the building to make it a more attractive purchase. Aurecon's strengthening scheme is based on achieving a target seismic capacity of 67% NBS IL2. Section 115 of the Building Act 2004 states (my emphasis in **bold**):

*An owner of a building must not change the use of the building –*

*...*

*(b) in any other case, unless the territorial authority gives the owner written notice that the territorial authority is satisfied, on reasonable grounds, that the building in its new use, --*

*(i) will comply, as near as is reasonably practicable, **with every provision of the building code that relates to the following:***

*(A) means of escape from fire, protection of other property, sanitary facilities, **structural performance** and fire-rating performance.*

- 19 This raises a question of whether the Council would accept a seismic strength of 67% NBS IL2 for the building even if it underwent a change of use.
- 20 While in some cases Council has accepted 67% NBS IL2 for strengthening existing buildings with a change of use, it is also possible that they would require it to achieve 100% NBS IL2. In the latter case, an engineering scheme could be provided that would achieve this level of seismic strength, however it would require more intervention and structural work.

**Peter Carney**

**20 September 2023**

# ST JAMES CHURCH RE-STRENGTHENING 69 RICCARTON ROAD CHRISTCHURCH



**FOR COSTING**  
NOT FOR CONSTRUCTION

Project No.	213970	Drawing No.	S-00-00	Revision	02
-------------	--------	-------------	---------	----------	----

20 10 0 10 20 30 40 50 100mm

## GENERAL NOTES

- STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION, ARCHITECTURAL, CIVIL AND BUILDING SERVICES DOCUMENTS.
- UNLESS NOTED OTHERWISE, ALL REDUCED LEVELS (RLs) ARE IN METRES, AND ALL DIMENSIONS ARE IN MILLIMETRES
- DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM DRAWINGS.
- ANY DISCREPANCIES ON THE DRAWINGS SHALL BE REFERRED TO THE ARCHITECT FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.
- THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION, INCLUDING TEMPORARY WORKS DESIGN, IS THE RESPONSIBILITY OF THE CONTRACTOR.
- THE METHOD OF EXCAVATION AND TEMPORARY SUPPORT OF ALL CUT FACES IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRANT CODES OF PRACTICE EXCEPT WHERE VARIED BY SPECIFICATION OR THE DRAWINGS
- WHERE PROPRIETARY PRODUCTS ARE SPECIFIED IN THE DOCUMENTS THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE PRODUCT FOR APPROVAL. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION.
- ALL NON-LOAD BEARING WALLS SHALL BE KEPT CLEAR OF THE UNDERSIDE OF SLABS AND BEAMS BY 20mm UNLESS OTHERWISE SHOWN.
- THE ENGINEER SHALL INSPECT STRUCTURAL DETAILS TO CM3 AS DEFINED IN THE ACENZ/IPENZ MODEL CONDITIONS. TYPICALLY INSPECT PRIOR TO:
  - MAJOR CONCRETE POURS
  - STRUCTURAL STEEL BEING CONCEALED
  - LININGS BEING PLACED OVER TIMBER BRACING DETAILS

CONTACT THE ENGINEER AT LEAST 48 HOURS PRIOR TO ARRANGE INSPECTION WHEN REQUIRED

## STANDARD ABBREVIATIONS

### 1. GENERAL ABBREVIATIONS AS FOLLOWS:

ALT - ALTERNATING  
 ARCH - ARCHITECT(S)  
 BOS - BOTTOM OF STEEL  
 BLDG - BUILDING  
 CC - CENTRE TO CENTRE  
 CJ - CONSTRUCTION JOINT  
 COS - CHECK ON SITE  
 CONC - CONCRETE  
 COV - COVER TO REINFORCEMENT  
 CVR - COVER TO REINFORCEMENT  
 CL - CENTRE LINE  
 CRS - CENTRES  
 CW - COMPLETE WITH  
 DFT - DRY FILM THICKNESS  
 DPM - DAMP-PROOF MEMBRANE  
 DIA - DIAMETER  
 FFL - FINISHED FLOOR LEVEL  
 FPBW - FULL PENETRATION BUTT WELD  
 FWAR - FILLET WELD ALL ROUND  
 GALV - GALVANISED  
 GL - GROUND LEVEL  
 HD - HOLDING DOWN (BOLT)  
 ID - INSIDE DIAMETER  
 IL - INVERT LEVEL  
 LG - LONG  
 MAX - MAXIMUM  
 MIN - MINIMUM  
 MS - MILD STEEL  
 NOM - NOMINAL  
 NTS - NOT TO SCALE  
 O/A - OVERALL  
 OD - OUTSIDE DIAMETER  
 PC - PRECAST CONCRETE  
 RAD - RADIUS  
 REQD - REQUIRED  
 RL - REDUCED LEVEL  
 SED - SMALL END DIAMETER  
 STGD - STAGGERED  
 SPEC - SPECIFICATION  
 SQ - SQUARE  
 SS - STAINLESS STEEL  
 TOS - TOP OF STEEL  
 THRU - THROUGH  
 TYP - TYPICAL  
 US - UNDERSIDE  
 UNO - UNLESS NOTED OTHERWISE  
 WP - WELD PLATE  
 ø - DRILL DIAMETER

### 2. ABBREVIATIONS FOR REINFORCED CONCRETE

B - BOTTOM  
 Bb - BOTTOM BARS, BOTTOM LAYER  
 Bt - BOTTOM BARS, TOP LAYER  
 T - TOP  
 Tb - TOP BARS, BOTTOM LAYER  
 Tt - TOP BARS, TOP LAYER  
 EW - EACH WAY  
 EF - EACH FACE  
 FF - FAR FACE  
 NF - NEAR FACE  
 REBAR - REINFORCING BARS  
 REINF - REINFORCEMENT  
 STR(S) - STIRRUP(S)  
 STR(S) - STARTER(S)  
 R - PLAIN ROUND REBAR GRADE 300  
 eg. R20 REFERS TO GRADE 300  
 PLAIN ROUND REBAR 20mm DIA.  
 HR - PLAIN ROUND REBAR GRADE 500  
 eg. HR20 REFERS TO GRADE 500  
 PLAIN ROUND REBAR 20mm DIA.  
 D - DEFORMED REBAR GRADE 300  
 eg. D20 REFERS TO GRADE 300  
 DEFORMED REBAR 20mm DIA.  
 HD - DEFORMED REBAR GRADE 500  
 eg. H20 REFERS TO GRADE 500  
 DEFORMED REBAR 20mm DIA.  
 RB - DEFORMED REID BAR (GRADE 500)  
 eg. RB20 REFERS TO DEFORMED  
 REID BAR 20mm DIA.  
 M - MESH  
 eg. M665 REFERS TO 665 MESH  
 GRADE 500 REFERS TO GRADE 500E MA

### 3. ABBREVIATIONS FOR STRUCTURAL STEEL

UB - UNIVERSAL BEAM  
 UC - UNIVERSAL COLUMN  
 PFC - PARALLEL FLANGE CHANNEL  
 TFC - TAPER FLANGE CHANNEL  
 TFB - TAPER FLANGE BEAM  
 EA - EQUAL ANGLE  
 UA - UNEQUAL ANGLE  
 SHS - SQUARE HOLLOW SECTION  
 RHS - RECTANGULAR HOLLOW SECTION  
 CHS - CIRCULAR HOLLOW SECTION

## NOTES ON REINFORCED CONCRETE

### 1. MINIMUM CONCRETE STRENGTHS SHALL BE AS FOLLOWS UNLESS NOTED ON DRAWINGS:

- FOUNDATION CONCRETE - 25MPa
- SUSPENDED CONCRETE SLABS, TOPPING, BEAMS AND COLUMNS - 30MPa
- PRECAST CONCRETE - 30MPa
- GROUT INFILL TO BLOCK WALLS - 17.5MPa
- TIDY SLABS OR ANY OTHER NON-STRUCTURAL CONCRETE - 10MPa
- BALCONY CONCRETE - 40MPa

### 2. WHERE THE DRAWINGS OR SPECIFICATIONS STATE THE SIZE OF CONCRETE ELEMENTS, THE STATED SIZE DOES NOT INCLUDE THICKNESS OF ANY APPLIED FINISHES. WHERE BEAM SIZES ARE NOTED ON THE DRAWINGS, THE WIDTH IS STATED FIRST AND THE DEPTH SECOND. THE DEPTH INCLUDES THE THICKNESS OF THE SLAB (IF ANY)

### 3. SHRINKAGE CONTROL

- SLABS ON GRADE SHALL BE POURED IN ALTERNATE PANELS NOT EXCEEDING 25m<sup>2</sup> OR 7m ON ANY ADJACENT PANELS. ALTERNATIVELY SAWCUT WITHIN 8 HOURS OF POURING, AFTER THE CONCRETE HAS HARDENED SUFFICIENTLY THAT IT WILL NOT BE DAMAGED BY THE CUTTING, BUT BEFORE SHRINKAGE CAN OCCUR (SOFT CUT METHOD). THE POSITIONS OF THE SAWCUT JOINTS ARE TO BE TO THE PATTERN SHOWN ON THE DRAWINGS OR AS AGREED WITH THE ENGINEER PRIOR TO POURING THE SLAB. SAWCUT JOINT SHALL BE PLACED TO ELIMINATE RE-ENTRANT CORNERS. THIS WILL USUALLY REQUIRED DIAMOND SHARED SAWCUTS AROUND COLUMNS. SAWCUTS MAY BE WIDENED LATER IF REQUIRED, AND ARE TO BE CLEANED OUT AND FILL TO THE ARCHITECT'S SPECIFICATION AS LATE AS POSSIBLE IN THE JOB.
- SLABS THAT REQUIRE CONSTRUCTION OR SHRINKAGE CONTROL JOINTS HAVE REQUIREMENTS GOVERNED BY THE SIZE OF THE POUR, SIZE OF THE SLAB, THICKNESS OF SLAB, SITE CONDITIONS AND MIX DESIGN. THESE JOINTS MAY VARY FROM A SIMPLE KEVED CONSTRUCTION JOINT TO SOPHISTICATED PROPRIETARY MOVEMENT JOINTS, INCLUDING ADDITIONAL LAYERS OF DPM TO FACILITATE A SLIP PLAIN. THE FINAL SOLUTION SHALL BE DETERMINED BY THE ENGINEER AFTER CONSULTATION WITH THE CONTRACTOR AND ANY NECESSARY SUB-CONTRACTORS.

### 4. NO PENETRATIONS, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE ELEMENTS WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.

### 5. SURFACE FINISHES TO THE CONCRETE SHALL BE AS STATED IN THE SPECIFICATION.

### 6. THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS OF ALL PRECAST ELEMENTS FOR REVIEW PRIOR TO MANUFACTURE.

### 7. PROPRIETARY PRECAST ELEMENTS REFERRED TO IN THE DRAWINGS (IF ANY) SHALL BE DESIGNED AND DETAILED BY SUPPLIER AND A COPY OF THE DOCUMENTATION SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO MANUFACTURE.

### 8. CONCRETE PLACING AND MOULDING TOLERANCES ARE TO BE AS STATED IN THE SPECIFICATION.

### 9. ALL PENETRATIONS THROUGH CONCRETE SLABS SHALL BE TRIMMED BY 2-H12 BARS TO EACH EDGE OF THE PENETRATIONS UNLESS OTHERWISE NOTED. TRIMMER BARS ARE TO EXTEND 750mm BEYOND THE EDGE OF THE PENETRATIONS.

### 10. ALL BEAMS SHALL BE FULLY PROPPED DURING CONSTRUCTION.

### 11. WELDING OF REINFORCEMENT IS NOT PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER. IN PILES AND CIRCULAR COLUMN, SPIRAL TIES MAY BE SUBSTITUTED BY WELDED HOOPS. REFER TO LAP WELDING DETAIL FOR REQUIREMENTS

### 12. TOP AND BOTTOM REINFORCEMENT IN SLABS SHALL BE ADEQUATELY SUPPORTED TO ENSURE ALL REINFORCING STAYS IN PLACE DURING CONCRETE POURING, BY HIGH CHAIRS OR OTHER APPROVED METHODS, PRECAST BLOCKS ARE NOT TO BE USED.

### 13. HOOKS AND BENDS TO REBAR ARE TO BE IN ACCORDANCE WITH NZS3109 UNLESS NOTED OTHERWISE ON THE DRAWINGS.

### 14. BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE SITE BENT UNLESS SHOWN ON THE DRAWINGS OR SPECIFICALLY APPROVED BY THE ENGINEER.

### 15. REINFORCEMENT SHALL BE GRADE 500E MA UNLESS NOTED OTHERWISE

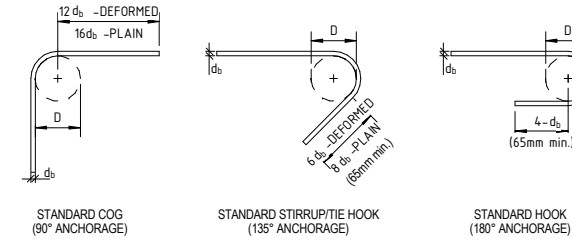
### 16. NO REINFORCEMENT SPLICES SHALL BE MADE, OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS, WITHOUT THE PRIOR APPROVAL OF THE ENGINEER. UNLESS NOTED OTHERWISE ON THE DRAWINGS, ALL REINFORCEMENT LAPS IN CONCRETE TO COMPLY WITH THE TABLE BELOW.

### 17. SPLICING OF REINFORCEMENT WHETHER BY LAPPING, WELDING OR MECHANICAL SPLICE, SHALL BE CARRIED OUT AS SHOWN ON THE DRAWINGS OR AS SPECIFICALLY APPROVED BY THE ENGINEER, EXCEPT AS NOTE BELOW: - WELDED WIRE MESH SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS. - REINFORCEMENT IN SLABS ON GRADE AND IN TOPPING SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS.

### 18. LAYERS OF BEAM REINFORCEMENT SHALL BE SEPARATED BY THE LARGER OF R25 OR NOMINAL DIAMETER BARS AT 1500 CENTRES.

### 19. ALL HOOKS ON STIRRUPS AND TIES MUST FIT CLOSELY AROUND MAIN BARS UNLESS NOTED OTHERWISE. FIRST STIRRUP NOT TO BE PLACED FURTHER THAN THE LESSER OF 1/2 STIRRUP SPACING OR 50mm FROM SUPPORT FACE

BAR SIZE	MAIN STEEL	STIRRUPS AND TIES
6	30	22
10	50	32
12	60	40
16	80	60
20	100	70
25	150	.....
32	195	.....
40	240	.....

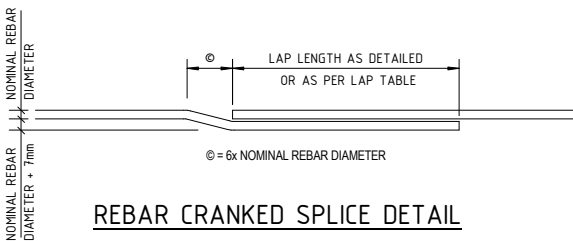


MINIMUM FORMER PIN DIAMETERS  
 "D" FOR BENDING REINFORCING BARS

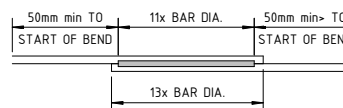
## REINFORCING BENDING DETAILS

ENVIRONMENT	CONCRETE COMPRESSIVE STRENGTH f <sub>c</sub> (MPa)		
	25	30	40
SURFACES CAST AGAINST AND EXPOSED TO EARTH	75	75	75
SURFACES CAST AGAINST DPM ON EARTH	50	50	50
EXTERIOR ENVIRONMENT WITHIN 500m OF HIGH TIDE MARK	50	45	40
OTHER EXTERIOR ENVIRONMENT	40	35	30
SURFACES EXPOSED TO EARTH (NON-AGGRESSIVE OR PROTECTED BY D.P.M.)	40	35	30
INTERIOR ENVIRONMENT NOT SUBJECTED TO REPEATED WETTING OR DRYING	25	20	20

NOTE:  
 CONCRETE COVERS ARE THE MINIMUM DISTANCE TO ANY REINFORCING STEEL, INCLUDING STIRRUPS AND TIES



## REBAR CRANKED SPLICE DETAIL



## SINGLE LAP WELD DETAIL

SEE AS1554-PART 3

NOTE:  
 IF LAP LENGTHS ARE NOT SPECIFICALLY STATED ON THE DRAWINGS THE FOLLOWING SHALL BE USED.

LAP LENGTHS FOR DEFORMED BARS (mm)	10	12	16	20	25	32
GRADE 300 (D)	400	480	640	800	1000	1280
GRADE 500 (HD)	600	720	960	1200	1500	1920

**FOR COSTING**  
 NOT FOR CONSTRUCTION

Rev.	Date	Revision Details	Des.	Ver.	App.
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**

Aurecon New Zealand Limited  
 Unit 1, 150 Cavendish Road (PO Box 1061)  
 Christchurch, New Zealand  
 Telephone: +64 3 366 0821  
 Facsimile: +64 3 379 6955  
 Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
 1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
 2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

Client:

ANGELICAN CHURCH  
 PROPERTY TRUSTEES

Project:

ST JAMES CHURCH, 69 RICCARTON  
 ROAD, CHRISTCHURCH

Drawn	Signed	Date	Drawing Title:
TDD	Signed	Issue Date	STANDARDS NOTES
Designed	Signed	Issue Date	
Verified	Signed	Issue Date	
Approved	Signed	Issue Date	
GKW	Signed	Issue Date	

Project No.	213970
Scale	As indicated
Drawing No.	S-00-01
Sheet Size	A1
Revision	01

## GENERAL NOTES

- ALL STEELWORK FABRICATION TO BE IN ACCORDANCE WITH NZS 3404:1997
- MINIMUM BOLT PLATE EDGE DISTANCES TO BE:  
**PLATE EDGE:**  
 M12 - 20 mm  
 M16 - 28 mm  
 M20 - 35 mm  
 M24 - 42 mm  
 M30 - 55 mm  
 M32 - 58 mm  
 DISTANCES BASED ON MACHINE FLAME CUT, SAWN OR PLANED EDGES. DISTANCES TO BE ADJUSTED TO NZS 3404 IF ALTERNATIVE CUTTING PROCEDURES ARE ADOPTED.
- MINIMUM BOLT CLEARANCE DISTANCES & c/c DISTANCES TO BE:  
**(CLEARANCE)**  
 M12 - 24 mm  
 M16 - 32 mm  
 M20 - 40 mm  
 M24 - 48 mm  
 M30 - 57 mm  
 M32 - 64 mm  
**(c/c)**  
 30mm  
 40mm  
 50mm  
 60mm  
 75mm  
 90mm
- ALL UB AND ANGLE MEMBERS TO BE GRADE 300 STEEL UNO.
- ALL HOLLOW SECTIONS TO BE GRADE 350 STEEL UNO.
- ALL PLATES TO BE GRADE 250 STEEL U.N.O.
- ALL EXTERNAL STEELWORK TO BE EITHER HOT DIP GALVANISED AND SEAL COATED AFTER FABRICATION, OR PAINTED TO AN EXTERNAL PAINTING SPECIFICATION (ALL EXTERNAL STEEL IN CONTACT WITH EXPOSED TIMBER TO HAVE 150 MICRONS OF EPOXY POWDER COATING OR HIGH BUILD EPOXY COATING). REFER TO SPECIFICATION FOR PAINT COATINGS AND FINISHES.
- ALL WELDING TO 6 mm FWAR UNLESS NOTED OTHERWISE. ALL WELDING TO BE SP GRADE.
- SHOP DRAWINGS TO BE PROVIDED AND REVIEWED FOR STRUCTURAL CONTENT PRIOR TO CONSTRUCTION.
- ALL BOLTS TO BE GRADE 8.8: UNO.
- BOLTS - DESIGNATED BY THE NUMBER, DIAMETER, GRADE AND TIGHTENING PROCEDURE E.G. 4M16 4.6/S DENOTES 4 NO. M16 COMMERCIAL GRADE BOLTS, SNUG TIGHT 6M20 8.8/TF DENOTES 6 NO. M20 HIGH STRENGTH STRUCTURAL BOLTS FULLY TENSIONED IN A NO SLIP JOINT 6M24 8.8/TB DENOTES 6 NO. M24 HIGH STRENGTH STRUCTURAL BOLTS FULLY TENSIONED IN A BEARING JOINT (SOME SLIP ALLOWED)
- CONTACT SURFACES OF TF CONNECTIONS SHALL BE LEFT UNPAINTED AND FREE OF SCALE UNLESS OTHERWISE SPECIFIED. (INORGANIC ZINC SILICATE PAINT IS ACCEPTABLE IN 8.8/TF JOINTS.)
- LOAD INDICATING WASHERS OR TURN OF NUT METHOD SHALL BE USED TO VERIFY TIGHTENING OF BOLTS IN TF AND TB CONNECTIONS. TORQUE WRENCHES SHALL NOT BE USED. A HARDENED WASHER SHALL BE USED UNDER THE BOLT HEAD OR NUT, WHICH IS ROTATED THE RE-USE OF FULLY TENSIONED BOLTS IS PROHIBITED.
- THE ENDS OF ALL TUBULAR MEMBERS ARE TO BE SEALED WITH NOMINAL THICKNESS PLATES AND CONTINUOUS FILLET WELDED UNLESS NOTED OTHERWISE.
- ALL HOT DIP GALVANISED MEMBERS SHALL BE PROVIDED WITH VENT AND DRAINAGE HOLES IN ACCORDANCE WITH THE GALVANISER'S RECOMMENDATIONS.
- WHERE MEMBERS SHOWN ON THE STRUCTURAL OR ARCHITECTURAL DRAWINGS ARE REQUIRED TO BE CURVED, BENT OR ROLLED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE METHODS REQUIRED TO ACHIEVE THE REQUIRED SHAPES WITHOUT LOCALISED DISTORTION OF THE MEMBERS.
- THE CONTRACTOR SHALL PROVIDE AND LEAVE IN PLACE, UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED, SUCH TEMPORARY BRACING AS IS NECESSARY TO STABILISE THE STRUCTURE DURING ERECTION.

## DEMOLITION

- ALL DEMOLITION MATERIALS TO REMAIN THE PROPERTY OF THE OWNER
- THE CONTRACTOR SHALL ALLOW TO REUSE SALVAGED BUILDING MATERIALS WHERE POSSIBLE
- THE CONTRACTOR IS TO LOCATE ALL EXISTING SERVICES BOTH ABOVE AND BELOW GROUND PRIOR TO COMMENCING ANY WORK
- ALLOW TO PROVIDE ALL NECESSARY PROPPING TO ENSURE CONTINUAL VERTICAL AND LATERAL SUPPORT OF THE ROOF AND WALLS DURING CONSTRUCTION

## SERVICES

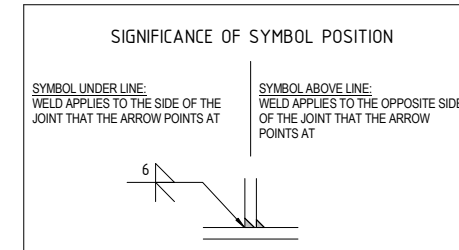
- CONTRACTOR TO ENSURE ALL INGROUND AND ABOVE GROUND SERVICES NOT ADVERSELY AFFECTED BY CONSTRUCTION ACTIVITIES. LOCATION OF ALL SUCH SERVICES TO BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION COMMENCES. NOTIFY THE ENGINEER PRIOR TO WORKS COMMENCING SHOULD THERE BE A CONFLICT WITH ANY CONSTRUCTION WORKS.

## WELD SYMBOLS

LOCATION	FILLET	V BUTT	BEVEL BUTT	SQUARE BUTT	U BUTT	J BUTT	EDGE OR SEAL	PLUG WELD	LAP WELD (FOR REBAR)
ARROW SIDE									
OTHER SIDE									NOT USED
BOTH SIDES							NOT USED	NOT USED	

## WELD DIMENSIONS

SIZE OF FILLET WELDS	FILLET WELDS WITH UNEQUAL LEGS	LENGTH OF WELD	INTERMITTENT WELDS
LEG LENGTH OF WELD IN mm AHEAD OF WELD SYMBOL	BOTH LEGS IN mm. REFER TO DRAWINGS FOR ORIENTATION	LENGTH OF WELD IN mm FOLLOWS SYMBOL. IF NO LENGTH SHOWN THE WELD EXTENDS THE FULL LENGTH OF THE JOINT	LENGTH OF WELD SHOWN UNBRACKETED. LENGTH OF GAP SHOWN BRACKETED

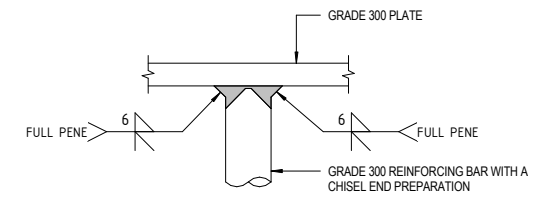


## SUPPLEMENTARY SYMBOLS

WELD ALL AROUND AND FIELD (SITE) WELD	PROCEDURE OR SPECIFICATION	GRIND FLUSH	BACKING STRIP	SEALING RUN BEHIND WELDS
WELD ALL AROUND INDICATED BY AN OPEN CIRCLE. FIELD WELD BY A FLAT IN AN EASTERLY WIND.	INDICATED BY A TAIL ON THE ARROW BEARING A REFERENCE TO A PROCEDURE, SCHEDULE OR SPECIFICATION CLAUSE.	INDICATED BY A LINE APPEARING ABOVE OR/AND BELOW THE SYMBOL. BELOW FOR ARROW SIDE AND ABOVE FOR OTHER SIDE.	BUTT WELDS ONLY. INDICATED BY 2 SINGLE LINES ABOVE EACH OTHER POSITIONED ON THE OPPOSITE SIDE TO THE SYMBOL.	INDICATED BY A HALF CIRCLE POSITIONED ON THE OPPOSITE SIDE TO THE SYMBOL.

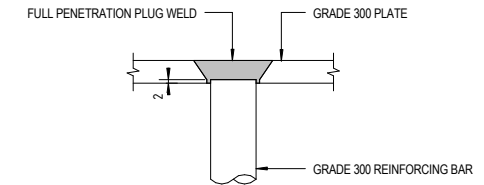
## NOTES:

- REFER DRAWING S-00-01 FOR STANDARD NOTES



### WELD PLATE ANCHOR BAR BUTT WELD DETAIL

THIS DETAIL IS DRAWN SHOWING A 12mm PLATE WITH D25 ANCHOR BARS. REFER TO THE DETAILED CASE FOR THE ACTUAL PLATE AND ANCHOR BAR SIZES.



### WELD PLATE ANCHOR BAR PLUG WELD DETAIL

THIS DETAIL IS DRAWN SHOWING A 12mm PLATE WITH D25 ANCHOR BARS. REFER TO THE DETAILED CASE FOR THE ACTUAL PLATE AND ANCHOR BAR SIZES.

### WELD PLATE ANCHOR BAR DETAIL

Rev.	Date	Revision Details	Des.	Ver.	App.
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

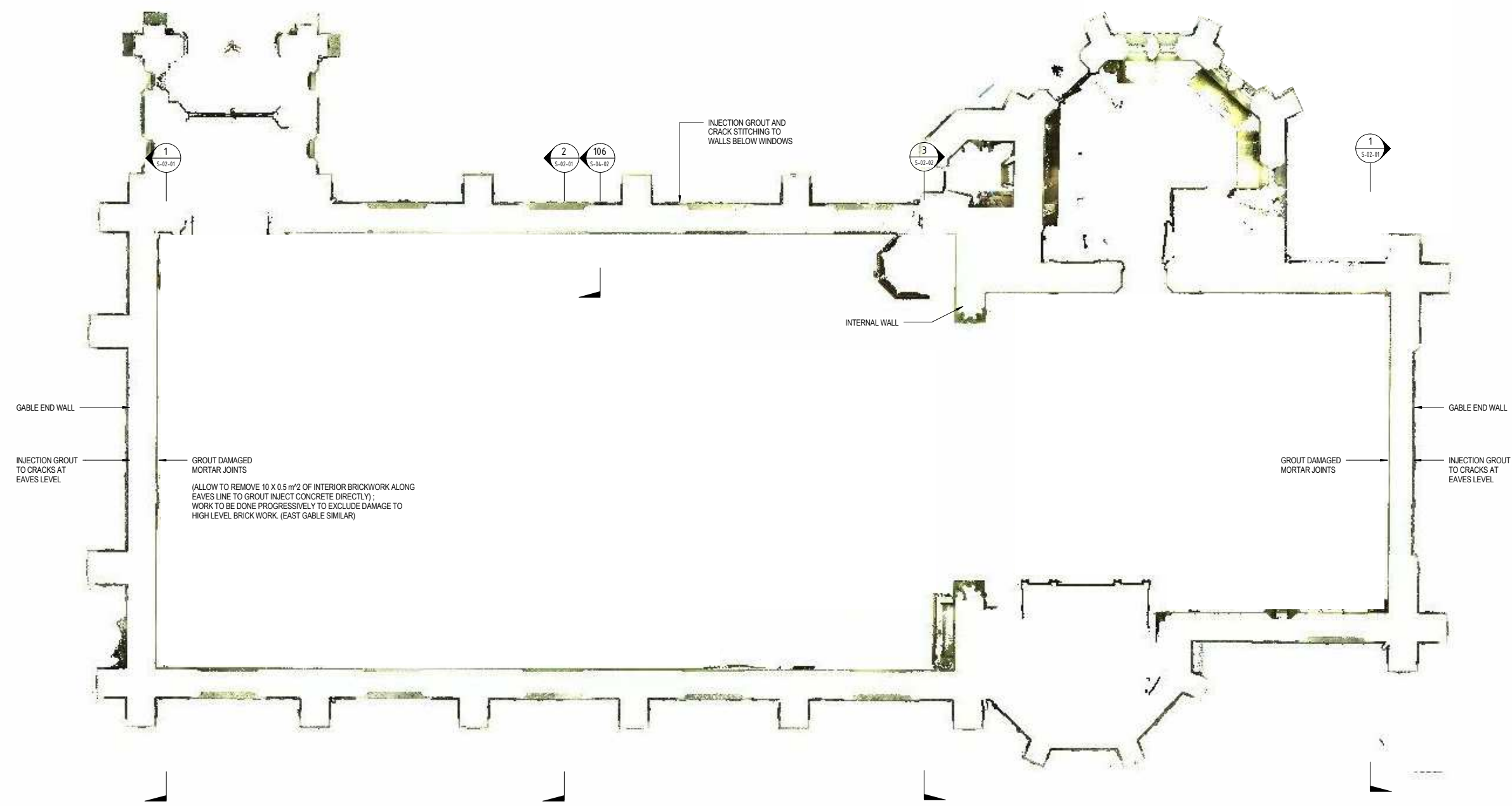
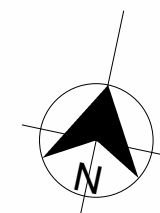
**aurecon**

Aurecon New Zealand Limited  
 Unit 1, 150 Gaiwardish Road (PO Box 1061)  
 Christchurch, New Zealand  
 Telephone: +64 3 366 0821  
 Facsimile: +64 3 379 6955  
 Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
 1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
 2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

Client:	Project:	Drawn:	Signed:	Date:	Drawing Title:
ANGELICAN CHURCH PROPERTY TRUSTEES	ST JAMES CHURCH, 69 RICcarton ROAD, CHRISTCHURCH	TDD		Issue Date	STEELWORK NOTES
		Designed:	Signed:	Date:	
		HD		Issue Date	
		Verified:	Signed:	Date:	
		GKW		Issue Date	
		Approved:	Signed:	Date:	
		GKW		Issue Date	
<b>FOR COSTING</b>					
<b>NOT FOR CONSTRUCTION</b>					
Project No. 213970					Sheet Size A1
Scale As indicated					Revision 01
Drawing No. S-00-02					

NOTES:  
1. REFER DRAWING S-00-01 FOR STANDARD NOTES



Rev.	Date	Revision Details	Des.	Ver.	App.
02	13-04-12	ISSUED FOR COSTING	HD	GKW	GKW
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**

Aurecon New Zealand Limited  
Unit 1, 150 Gairdner Road (PO Box 1061)  
Christchurch, New Zealand  
Telephone: +64 3 366 0821  
Facsimile: +64 3 379 6955  
Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

Client:  
**ANGLICAN CHURCH  
PROPERTY TRUSTEES**

Project:  
**ST JAMES CHURCH, 69 RICCARTON  
ROAD, CHRISTCHURCH**

Drawn TDD	Signed	Date Issue Date
Designed HD	Signed	Date Issue Date
Verified GKW	Signed	Date Issue Date
Approved GKW	Signed	Date Issue Date

Drawing Title:  
**GROUND FLOOR PLAN**

<b>FOR COSTING NOT FOR CONSTRUCTION</b>	
Project No. 213970	Sheet Size A1
Scale 1:50	Revision 02
Drawing No. S-01-01	



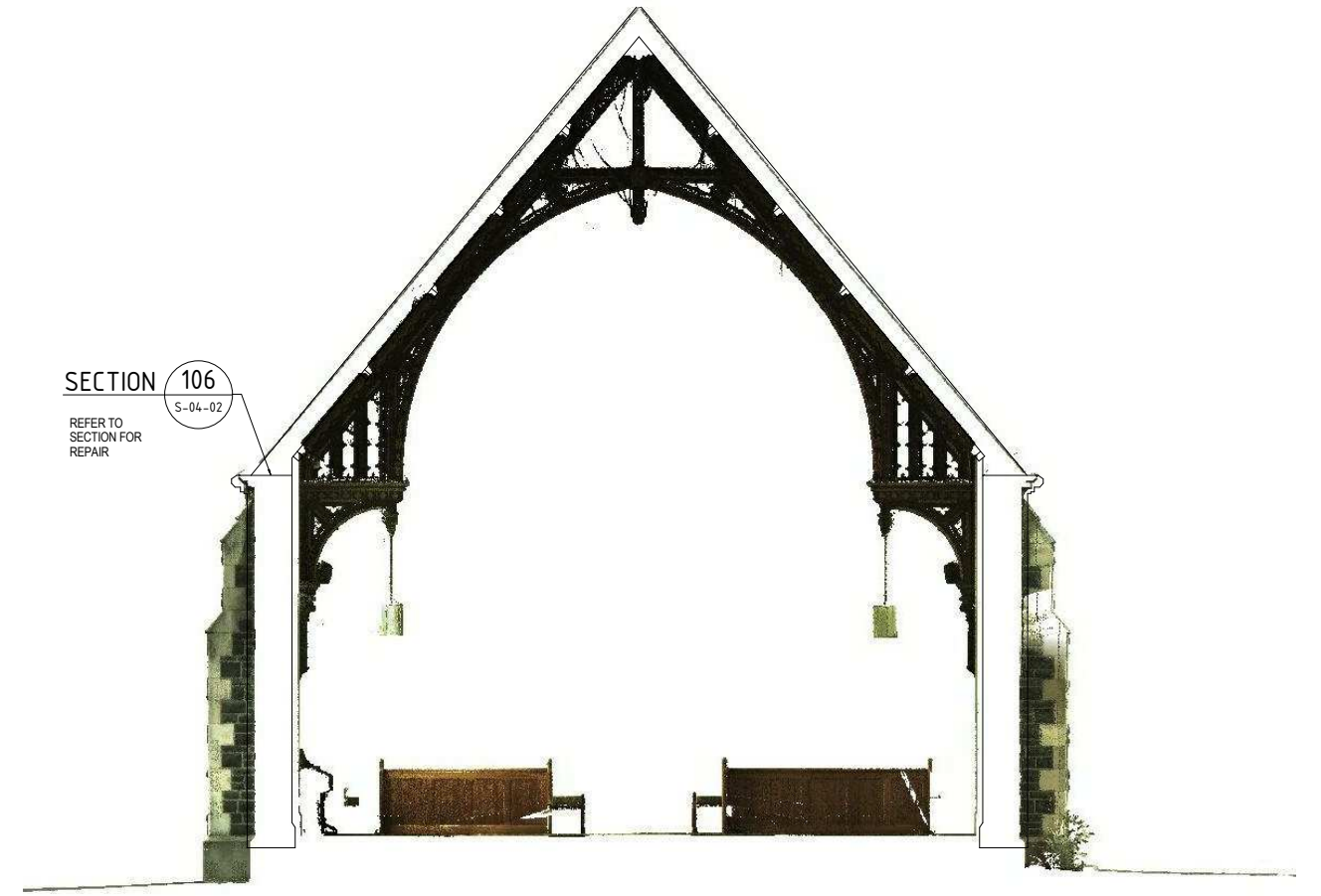


NOTES:  
1. REFER DRAWING S-00-01 FOR STANDARD NOTES



WESTERN WALL-INTERNAL ELEVATION (EASTERN WALL SIMILAR)

SECTION 1  
S-01-01



SECTION 2  
S-01-01

Rev.	Date	Revision Details	Des.	Ver.	App.
02	13-04-12	ISSUED FOR COSTING	HD	GKW	GKW
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**

Aurecon New Zealand Limited  
Unit 1, 150 Gavendish Road (PO Box 1061)  
Christchurch, New Zealand  
Telephone: +64 3 366 0821  
Facsimile: +64 3 379 6955  
Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

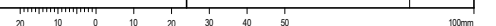
Client:  
**ANGLICAN CHURCH  
PROPERTY TRUSTEES**

Project:  
**ST JAMES CHURCH, 69 RICCARTON  
ROAD, CHRISTCHURCH**

Drawn TDD	Signed	Date Issue Date
Designed HD	Signed	Date Issue Date
Verified GKW	Signed	Date Issue Date
Approved GKW	Signed	Date Issue Date

Drawing Title:  
**BUILDING CROSS SECTIONS - SHEET 1**

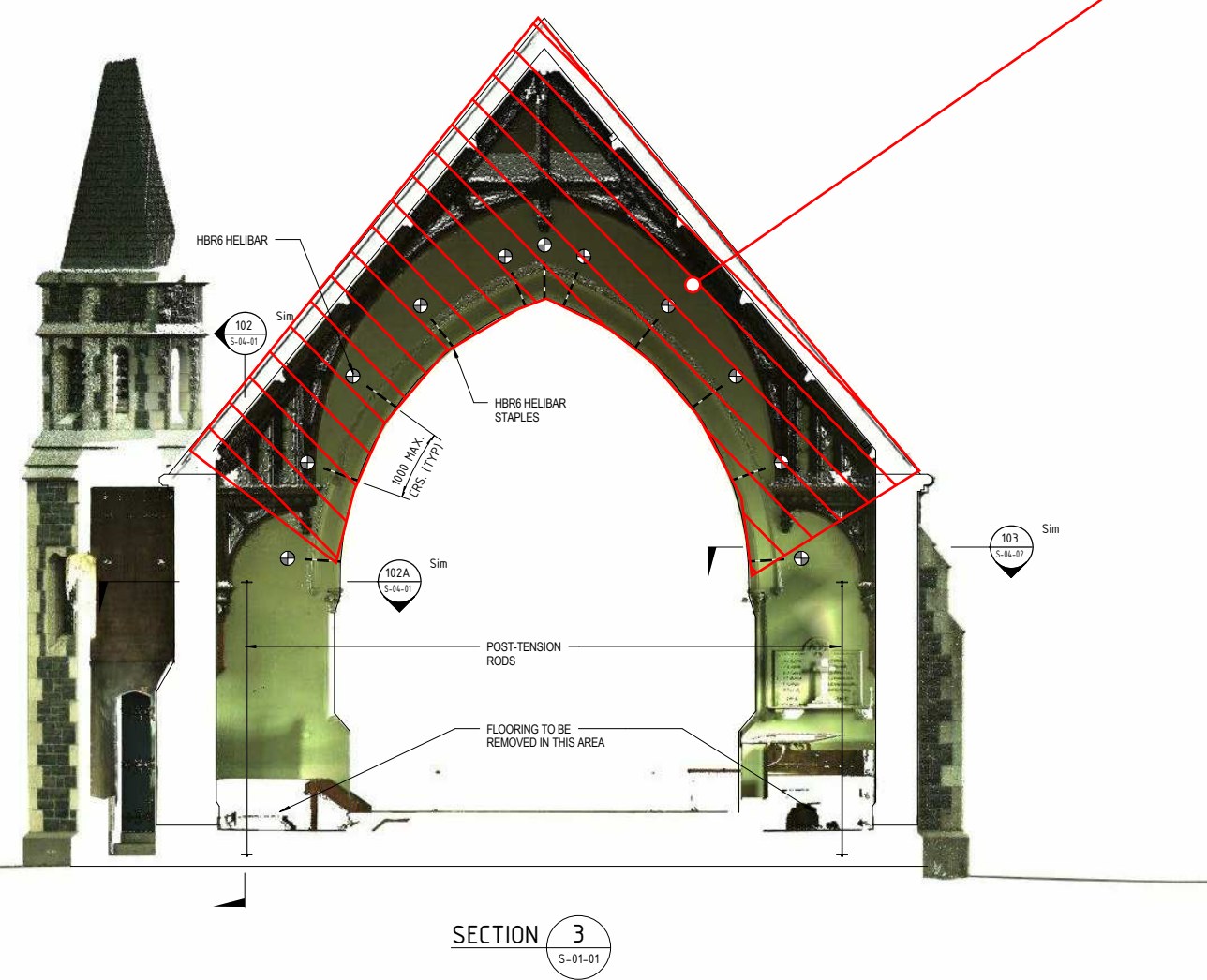
<b>FOR COSTING NOT FOR CONSTRUCTION</b>	
Project No. 213970	Sheet Size A1
Scale 1:50	Revision 02
Drawing No. S-02-01	



Aurecon report calls for:

Apply 30 mm engineered cementitious composites (ECC) on the wall face to add strength against pounding forces from the roof.

Alternative recommendation would be to tie the arch into each underpurlin with through-anchors and fabricated brackets, similar to 100/S04-01



Rev.	Date	Revision Details	Des.	Ver.	App.
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**  
 Aurecon New Zealand Limited  
 Unit 1, 150 Gaiwardish Road (PO Box 1061)  
 Christchurch, New Zealand  
 Telephone: +64 3 366 0821  
 Facsimile: +64 3 379 6955  
 Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
 1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
 2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

Client:  
**ANGLICAN CHURCH PROPERTY TRUSTEES**

Project:  
**ST JAMES CHURCH, 69 RICcarton ROAD, CHRISTCHURCH**

Drawn TDD	Signed	Date Issue Date
Designed HD	Signed	Date Issue Date
Verified GKW	Signed	Date Issue Date
Approved GKW	Signed	Date Issue Date

Drawing Title:  
**BUILDING CROSS SECTIONS - SHEET 2**

<b>FOR COSTING NOT FOR CONSTRUCTION</b>	
Project No. 213970	Sheet Size A1
Scale 1:50	Revision 01
Drawing No. S-02-02	

NOTES:  
1. REFER DRAWING S-00-01 FOR STANDARD NOTES

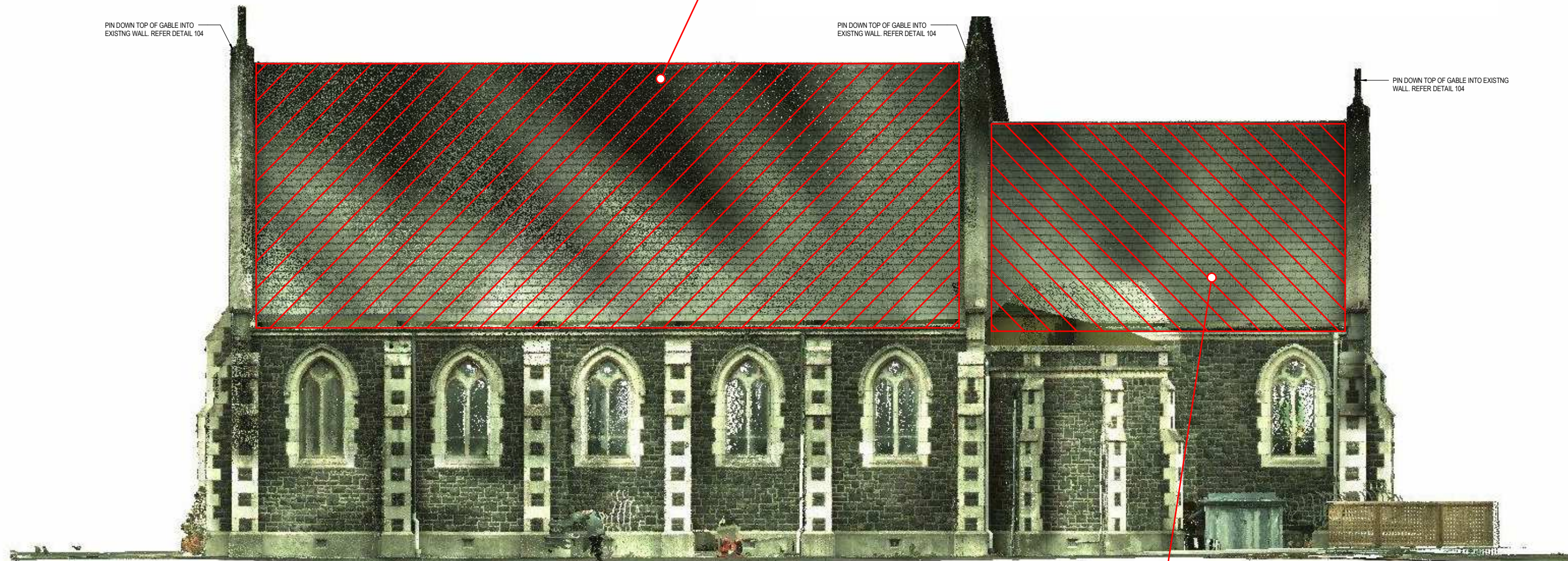
Existing roof/ceiling diaphragm requires strengthening. Allow for one of the following:

1. Temporarily remove and store slates (allowing for wastage/replacement), provide temporary weather protection to exposed roof, apply plywood roof overlay atop existing sarking, reinstate battens and slate roof.

or

2. Temporarily remove existing ceiling lining and store for reinstatement, apply plywood ceiling underlay, reinstate original ceiling lining.

Refer detail 100/ and 100a/S04-01 for further information.



Lower roof does not require new ceiling/roof diaphragm

Allow to tie gable end wall and internal arch to roof framing in line with SSK-002 (i.e. requires temporary ceiling removal)

Allow to expose roof eaves and improve either roof sarking-to-wall or ceiling-to-wall diaphragm connections in line with SSK-004

**FOR COSTING**  
**NOT FOR CONSTRUCTION**

Rev.	Date	Revision Details	Des.	Ver.	App.
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**

Aurecon New Zealand Limited  
Unit 1, 150 Gairdner Road (PO Box 1061)  
Christchurch, New Zealand  
Telephone: +64 3 366 0821  
Facsimile: +64 3 379 6955  
Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

Client:

ANGLICAN CHURCH  
PROPERTY TRUSTEES

Project:

ST JAMES CHURCH, 69 RICcarton  
ROAD, CHRISTCHURCH

Drawn TDD	Signed	Date Issue Date
Designed HD	Signed	Date Issue Date
Verified GKW	Signed	Date Issue Date
Approved GKW	Signed	Date Issue Date

Drawing Title:

SOUTH ELEVATION

Project No.

213970

Scale

1:50

Sheet Size

A1

Drawing No.

S-03-01

Revision

01

20 10 0 10 20 30 40 50 100mm

Existing roof/ceiling diaphragm requires strengthening. Allow for one of the following: **NOTES:**

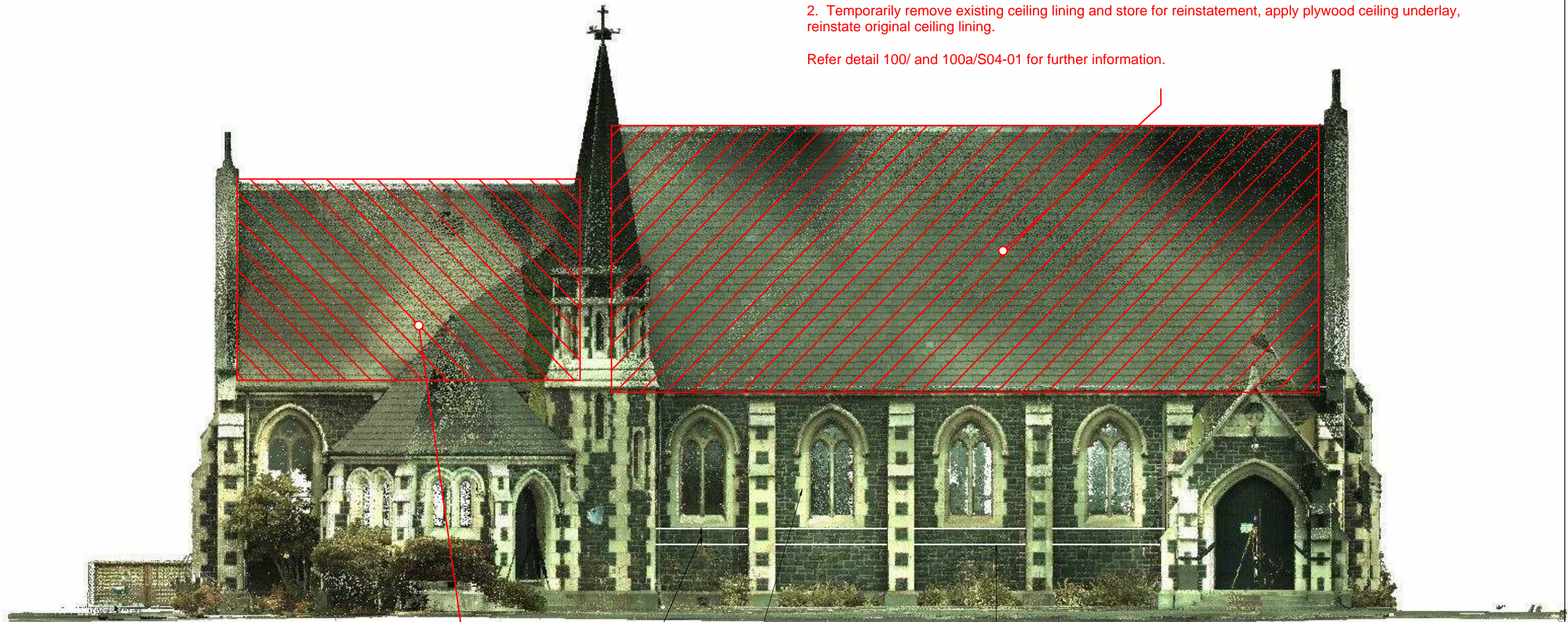
1. REFER DRAWING S-00-01 FOR STANDARD NOTES

1. Temporarily remove and store slates (allowing for wastage/replacement), provide temporary weather protection to exposed roof, apply plywood roof overlay atop existing sarking, reinstate battens and slate roof.

or

2. Temporarily remove existing ceiling lining and store for reinstatement, apply plywood ceiling underlay, reinstate original ceiling lining.

Refer detail 100/ and 100a/S04-01 for further information.



MATCH LOCATION OF  
MOIR JOINTS

ALLOW TO REMOVE INTERIOR PLASTER ON THIS  
PIER WITHIN  
200 mm EITHER SIDE OF VISIBLE CRACK. ALLOW  
TO GROUT  
INJECT CRACKS AND FINISH WALL TO MATCH  
ORIGINAL STONEMASON  
TO CONFIRM METHOD OF REPAIR SLIGHTLY  
DISJOINTED WINDOW  
TRACERY

CRACK STITCHING AND GROUT  
INJECTION TO STONE WORK BELOW  
WINDOWS EACH FACE. REFER DETAIL 105

Lower roof does not require new ceiling/roof diaphragm

Allow to tie gable end wall and internal arch to roof framing in line with SSK-002 (i.e. requires temporary ceiling removal)

Allow to expose roof eaves and improve either roof sarking-to-wall or ceiling-to-wall diaphragm connections in line with SSK-004

Rev.	Date	Revision Details	Des.	Ver.	App.
02	13-04-12	ISSUED FOR COSTING	HD	GKW	GKW
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**  
 Aurecon New Zealand Limited  
 Unit 1, 150 Gaiensh Road (PO Box 1061)  
 Christchurch, New Zealand  
 Telephone: +64 3 366 0821  
 Facsimile: +64 3 379 6955  
 Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
 1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
 2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

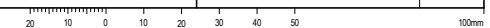
Client:  
**ANGLICAN CHURCH  
PROPERTY TRUSTEES**

Project:  
**ST JAMES CHURCH, 69 RICCARTON  
ROAD, CHRISTCHURCH**

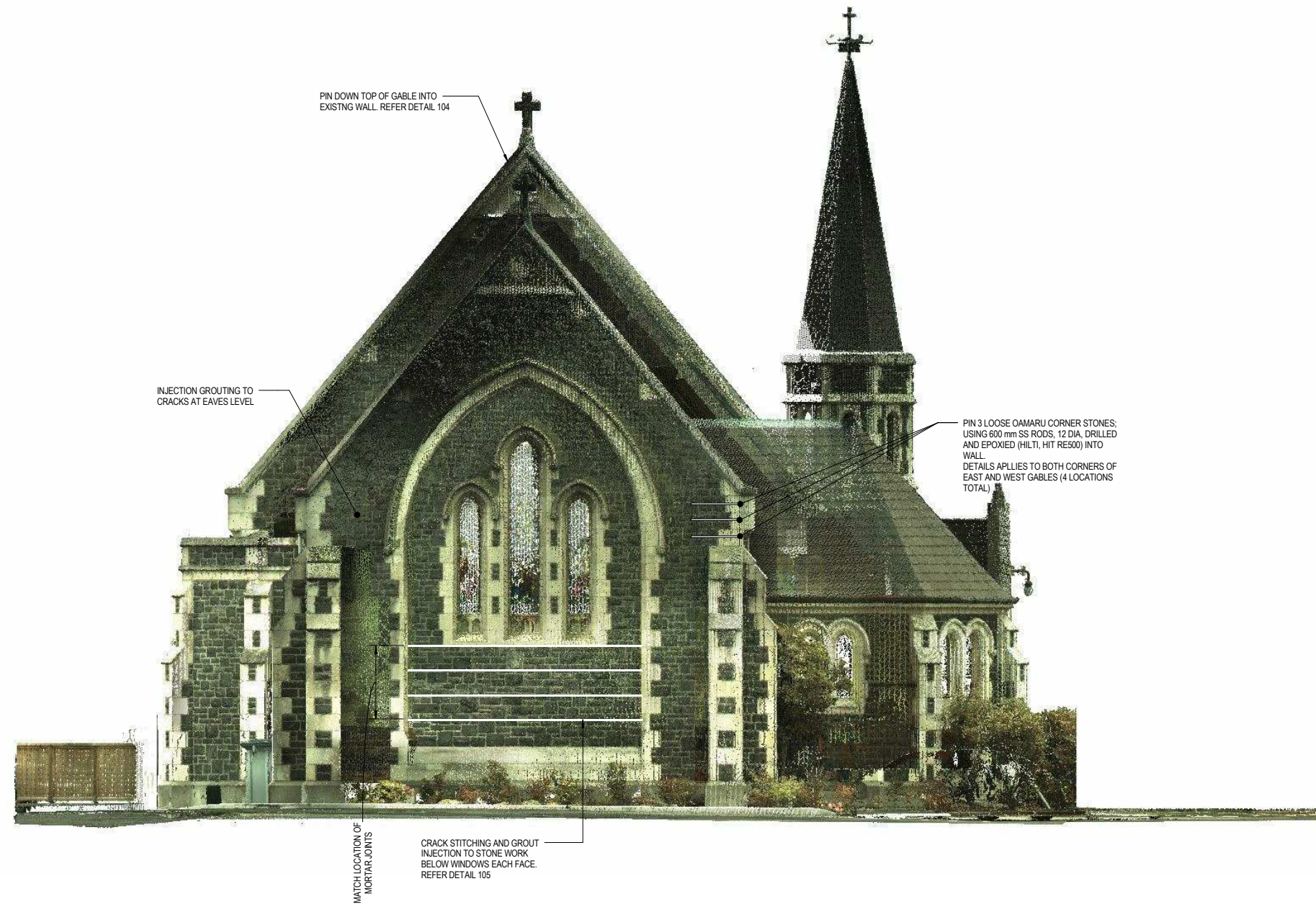
Drawn TDD	Signed	Date Issue Date
Designed HD	Signed	Date Issue Date
Verified GKW	Signed	Date Issue Date
Approved GKW	Signed	Date Issue Date

Drawing Title:  
**NORTH ELEVATION**

<b>FOR COSTING NOT FOR CONSTRUCTION</b>	
Project No. 213970	Sheet Size A1
Scale 1:50	Revision 02
Drawing No. S-03-02	



**NOTES:**  
 1. REFER DRAWING S-00-01 FOR STANDARD NOTES



Rev.	Date	Revision Details	Des.	Ver.	App.
02	13-04-12	ISSUED FOR COSTING	HD	GKW	GKW
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**  
 Aurecon New Zealand Limited  
 Unit 1, 150 Gaienshish Road (PO Box 1061)  
 Christchurch, New Zealand  
 Telephone: +64 3 366 0821  
 Facsimile: +64 3 379 6955  
 Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
 1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
 2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

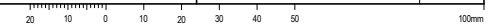
Client:  
**ANGLICAN CHURCH  
 PROPERTY TRUSTEES**

Project:  
**ST JAMES CHURCH, 69 RICcarton  
 ROAD, CHRISTCHURCH**

Drawn TDD	Signed	Date Issue Date
Designed HD	Signed	Date Issue Date
Verified GKW	Signed	Date Issue Date
Approved GKW	Signed	Date Issue Date

Drawing Title:  
**EAST ELEVATION**

<b>FOR COSTING NOT FOR CONSTRUCTION</b>	
Project No. 213970	Sheet Size A1
Scale 1:50	Revision 02
Drawing No. S-03-03	



**NOTES:**  
 1. REFER DRAWING S-00-01 FOR STANDARD NOTES



Rev.	Date	Revision Details	Des.	Ver.	App.
02	13-04-12	ISSUED FOR COSTING	HD	GKW	GKW
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**  
 Aurecon New Zealand Limited  
 Unit 1, 150 Gaiwardish Road (PO Box 1061)  
 Christchurch, New Zealand  
 Telephone: +64 3 366 0821  
 Facsimile: +64 3 379 6955  
 Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
 1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
 2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

Client:  
**ANGLICAN CHURCH  
 PROPERTY TRUSTEES**

Project:  
**ST JAMES CHURCH, 69 RICCARTON  
 ROAD, CHRISTCHURCH**

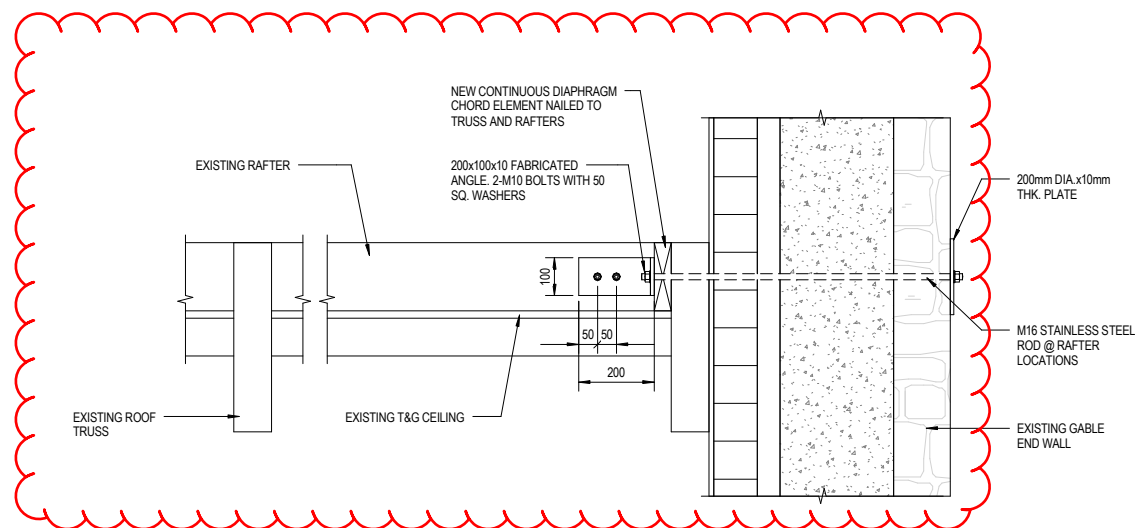
Drawn TDD	Signed	Date Issue Date
Designed HD	Signed	Date Issue Date
Verified GKW	Signed	Date Issue Date
Approved GKW	Signed	Date Issue Date

Drawing Title:  
**WEST ELEVATION**

<b>FOR COSTING NOT FOR CONSTRUCTION</b>	
Project No. 213970	Sheet Size A1
Scale 1:50	Revision 02
Drawing No. S-03-04	



NOTES:  
1. REFER DRAWING S-00-01 FOR STANDARD NOTES

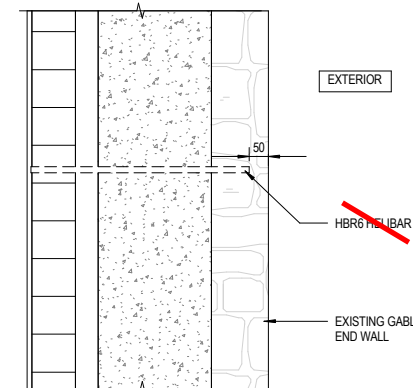


SECTION 100  
1:10  
S-02-01

250 x 250 RC tie beam, formed and poured prior to post-tensioning vertical rods.

refer to appended SSK-001 and -002 for recommended detail

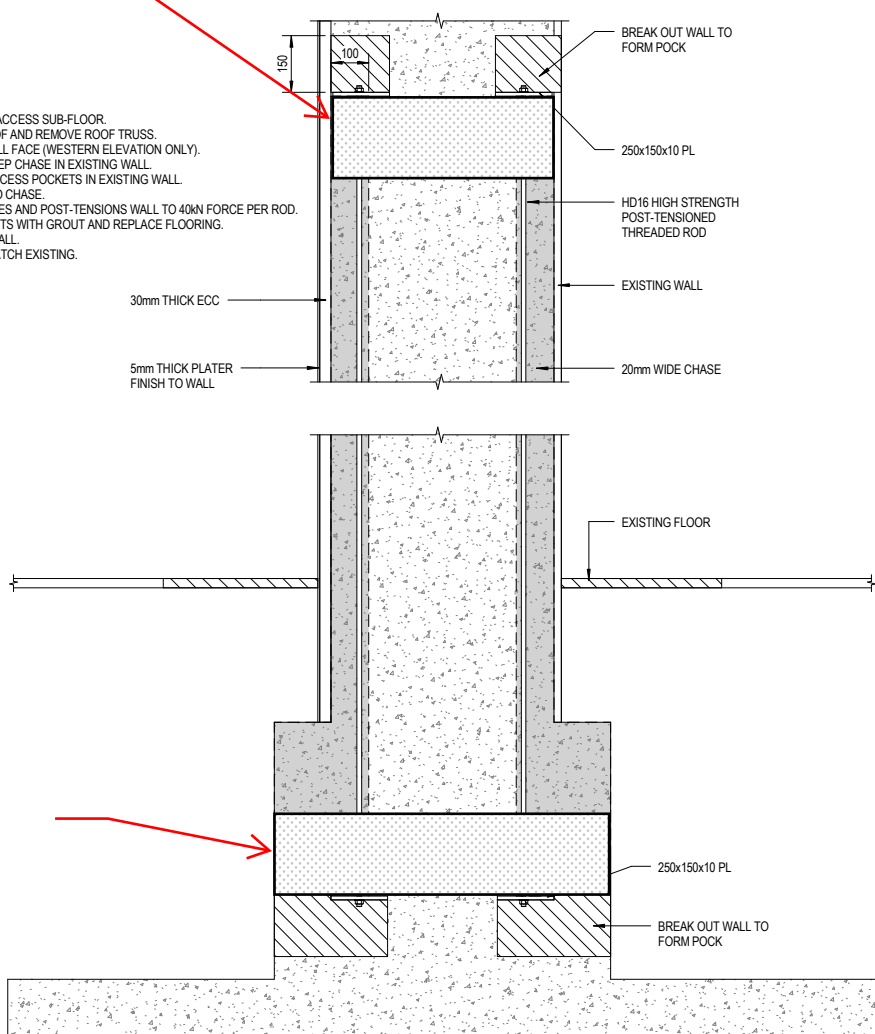
- PHASE OF WORK
1. REMOVE PLASTER AT 'CEMTIE' LOCATIONS.
  2. REMOVE ANY LOOSE BRICKS.
  3. REBUILD WALL WITH LIKE FOR LIKE MATERIALS AND GROUT.
  4. BOND WALL LAYERS TOGETHER USING 'CEMTIE' (GROUTED HELIBAR)
  5. FINISH WALL WITH CEMENT PLASTER TO MATCH EXISTING.



DETAIL 101  
1:10  
S-02-01

Use Python masonry screws @ 500 crs. each way

- PHASE OF WORK
1. REMOVE PART OF FLOOR TO ACCESS SUB-FLOOR.
  2. TEMPORARILY PROP THE ROOF AND REMOVE ROOF TRUSS.
  3. PEEL OFF PLASTER FROM WALL FACE (WESTERN ELEVATION ONLY).
  4. SAWCUT 20mm WIDE X 100 DEEP CHASE IN EXISTING WALL.
  5. CREATE TOP AND BOTTOM ACCESS POCKETS IN EXISTING WALL.
  6. INSERT THREADED RODS INTO CHASE.
  7. GROUT CHASE, SECURE PLATES AND POST-TENSION WALL TO 40kN FORCE PER ROD.
  8. FILL TOP AND BOTTOM POCKETS WITH GROUT AND REPLACE FLOORING.
  9. APPLY 30mm THICK ECC TO WALL.
  10. PLASTER FINISH WALL TO MATCH EXISTING.



SECTION 102  
1:10  
S-02-02

250 x 250 RC tie beam, formed and poured prior to post-tensioning vertical rods.

Rev.	Date	Revision Details	Des.	Ver.	App.
02	13-04-12	ISSUED FOR COSTING	HD	GKW	GKW
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**

Aurecon New Zealand Limited  
Unit 1, 150 Cavendish Road (PO Box 1061)  
Christchurch, New Zealand  
Telephone: +64 3 366 0821  
Facsimile: +64 3 379 6955  
Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

Client:  
**ANGLICAN CHURCH  
PROPERTY TRUSTEES**

Project:  
**ST JAMES CHURCH, 69 RICCARTON  
ROAD, CHRISTCHURCH**

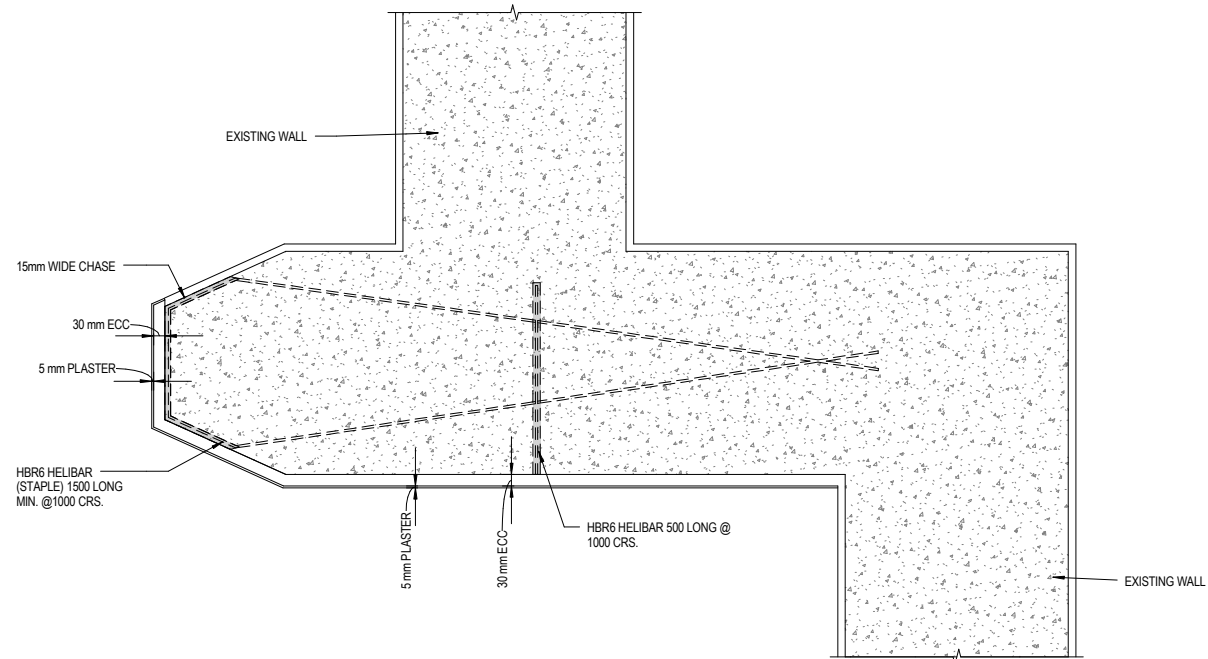
Drawn	Signed	Date
TDD		Issue Date
Designed	Signed	Date
HD		Issue Date
Verified	Signed	Date
GKW		Issue Date
Approved	Signed	Date
GKW		Issue Date

Drawing Title:  
**REPAIR DETAILS - SHEET 1**

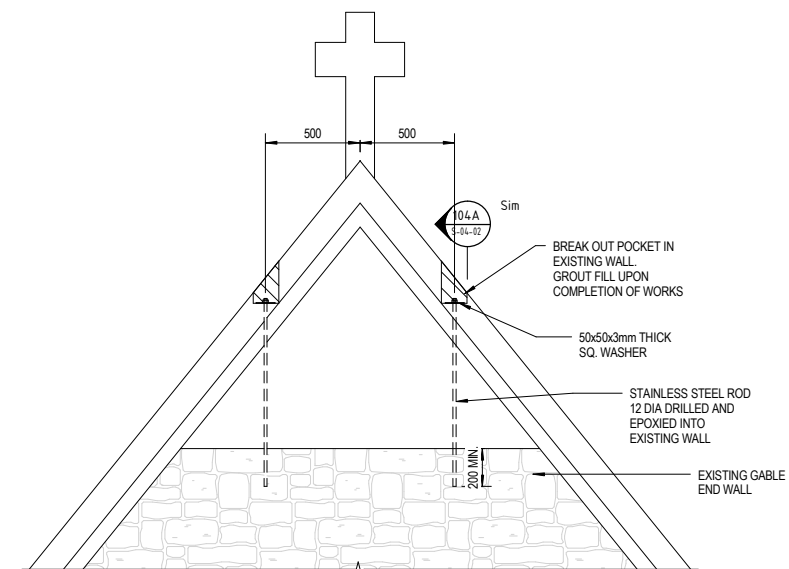
FOR COSTING NOT FOR CONSTRUCTION	
Project No. 213970	Sheet Size A1
Scale 1:10	Revision 02
Drawing No. S-04-01	



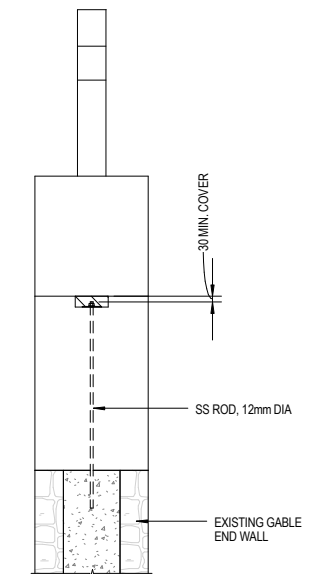
NOTES:  
1. REFER DRAWING S-00-01 FOR STANDARD NOTES



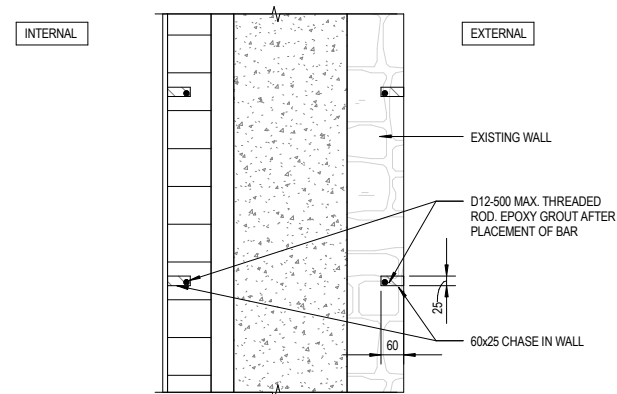
SECTION 103  
1:10 S-02-02



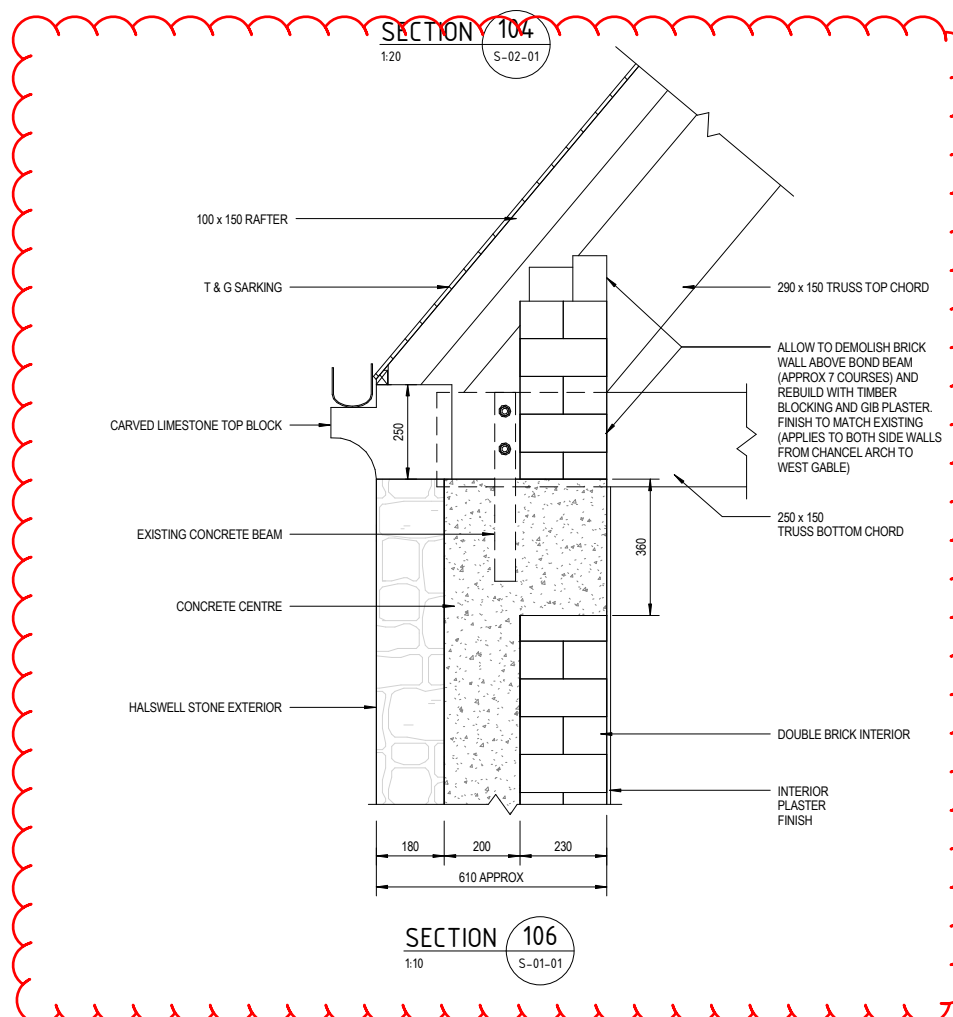
SECTION 104  
1:20 S-02-01



SECTION 104A  
1:20 S-02-01



SECTION 105  
1:10 S-02-01



SECTION 106  
1:10 S-01-01

refer to appended SSK-003 and -004

Rev.	Date	Revision Details	Des.	Ver.	App.
02	13-04-12	ISSUED FOR COSTING	HD	GKW	GKW
01	28-07-11	ISSUED FOR COSTING	HD	GKW	GKW

**aurecon**  
Aurecon New Zealand Limited  
Unit 1, 150 Gavendish Road (PO Box 1061)  
Christchurch, New Zealand  
Telephone: +64 3 366 0821  
Facsimile: +64 3 379 6955  
Email: christchurch@ap.aurecongroup.com

A person using Aurecon drawings and other data accepts the risk of:  
1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;  
2. using the drawings or other data for any purpose not agreed to in writing by Aurecon.

Client:  
**ANGLICAN CHURCH  
PROPERTY TRUSTEES**

Project:  
**ST JAMES CHURCH, 69 RICCARTON  
ROAD, CHRISTCHURCH**

Drawn TDD	Signed	Date Issue Date
Designed HD	Signed	Date Issue Date
Verified GKW	Signed	Date Issue Date
Approved GKW	Signed	Date Issue Date

Drawing Title:  
**REPAIR DETAILS - SHEET 2**

FOR COSTING NOT FOR CONSTRUCTION	
Project No. 213970	Sheet Size A1
Scale As indicated	Revision 02
Drawing No. S-04-02	



(2) new 100w blocks sistered together and placed within each rafter bay up to first internal truss line

fix purlins into underside of blocking with Type 17 wood screws, recessed and holes plugged to maintain heritage appearance

multigrips or similar at each end of each block

new plywood diaphragm

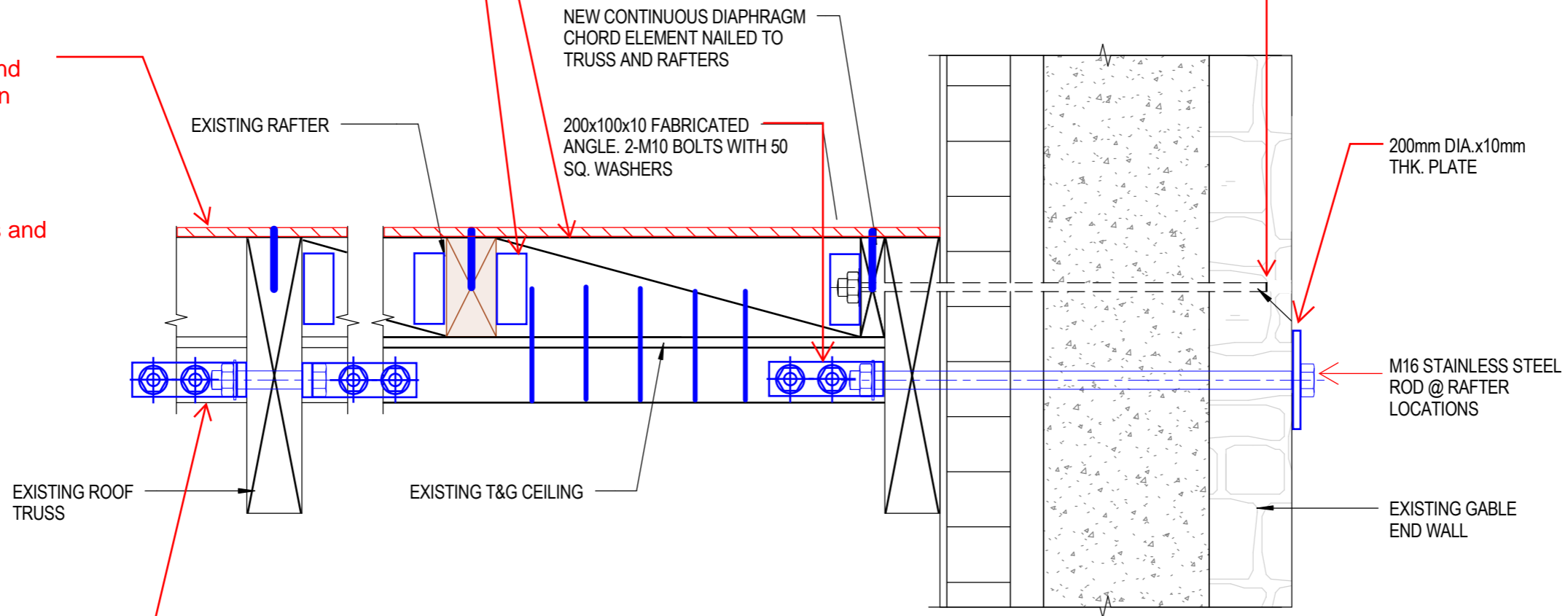
remove existing slates, battens and roofing paper

allow for slate wastage due to damage during removal

allow for temporary scaffolding and shrink wrap for weather protection

fix new plywood diaphragm atop existing roof sarking

install new roofing paper, battens and new/original roof slates



M16 threaded rods epoxied into masonry walls @ 600 crs.

200mm DIA.x10mm THK. PLATE

M16 STAINLESS STEEL ROD @ RAFTER LOCATIONS

EXISTING GABLE END WALL

EXISTING ROOF TRUSS

EXISTING T&G CEILING

NEW CONTINUOUS DIAPHRAGM CHORD ELEMENT NAILED TO TRUSS AND RAFTERS

200x100x10 FABRICATED ANGLE. 2-M10 BOLTS WITH 50 SQ. WASHERS

EXISTING RAFTER

fabricated brackets to continuously tie every second line of purlins across each truss

# SSK-001 - Roof Diaphragm Option #1

	PROJECT: _____
	JOB NO: _____ DATE: _____
	SSK: _____ REV: X

(2) new 100w blocks sistered together and placed within each rafter bay up to first internal truss line

fix purlins into underside of blocking with Type 17 wood screws, recessed and holes plugged to maintain heritage appearance

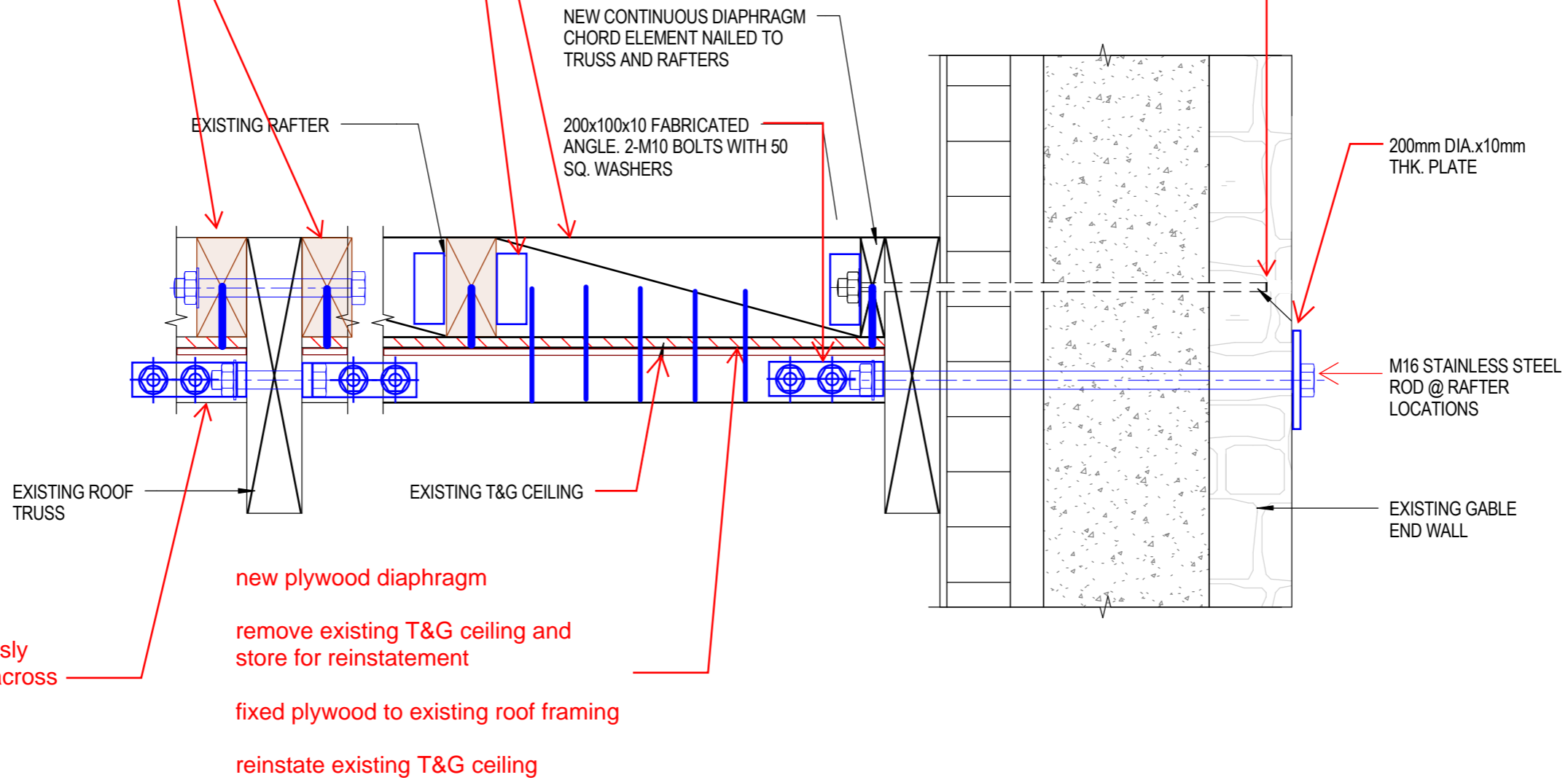
multigrips or similar at each end of each block

continuous blocking each side of each truss chord

fixed through truss chord with bolts @ 600 crs.

plywood diaphragm nailed into blocks

M16 threaded rods epoxied into masonry walls @ 600 crs.



fabricated brackets to continuously tie every second line of purlins across each truss

new plywood diaphragm

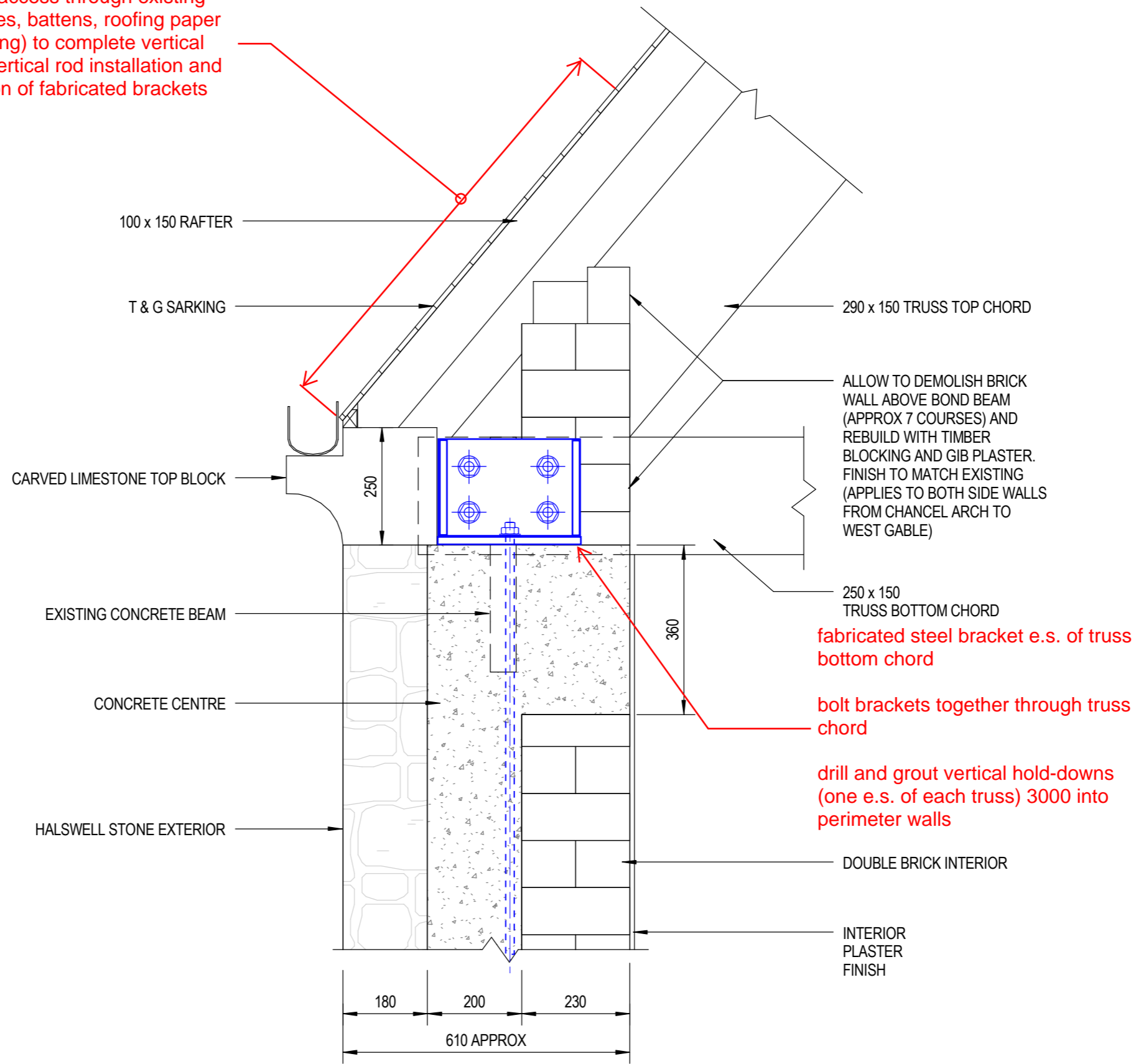
remove existing T&G ceiling and store for reinstatement

fixed plywood to existing roof framing

reinstate existing T&G ceiling

# SSK-001 - Roof Diaphragm Option #2

allow for access through existing roof (slates, battens, roofing paper and sarking) to complete vertical drilling, vertical rod installation and installation of fabricated brackets



SECTION 106  
1:10 S-01-01

if roof diaphragm (Option #1) is preferred, refer to this arrangement

if ceiling diaphragm (Option #2) is preferred, refer to this arrangement

plywood diaphragm

100 x 150 RAFTER

timber stud wall

T & G SARKING

290 x 150 TRUSS TOP CHORD

if roof diaphragm (Option #1) is preferred, eave stones (highlighted yellow) will require temporary removal, storage and reinstatement once roof diaphragm work is complete

CARVED LIMESTONE TOP BLOCK

250

ALLOW TO DEMOLISH BRICK WALL ABOVE BOND BEAM (APPROX 7 COURSES) AND REBUILD WITH TIMBER BLOCKING AND GIB PLASTER. FINISH TO MATCH EXISTING (APPLIES TO BOTH SIDE WALLS FROM CHANCEL ARCH TO WEST GABLE)

EXISTING CONCRETE BEAM

250 x 150 TRUSS BOTTOM CHORD

CONCRETE CENTRE

360

drilled and epoxied threaded rods @ 600 crs.

HALSWELL STONE EXTERIOR

DOUBLE BRICK INTERIOR

INTERIOR PLASTER FINISH

180

200


230

610 APPROX

SECTION 106

1:10

S-01-01

	PROJECT: _____
	JOB NO: _____ DATE: _____
	SSK: _____ REV: X