

5177600

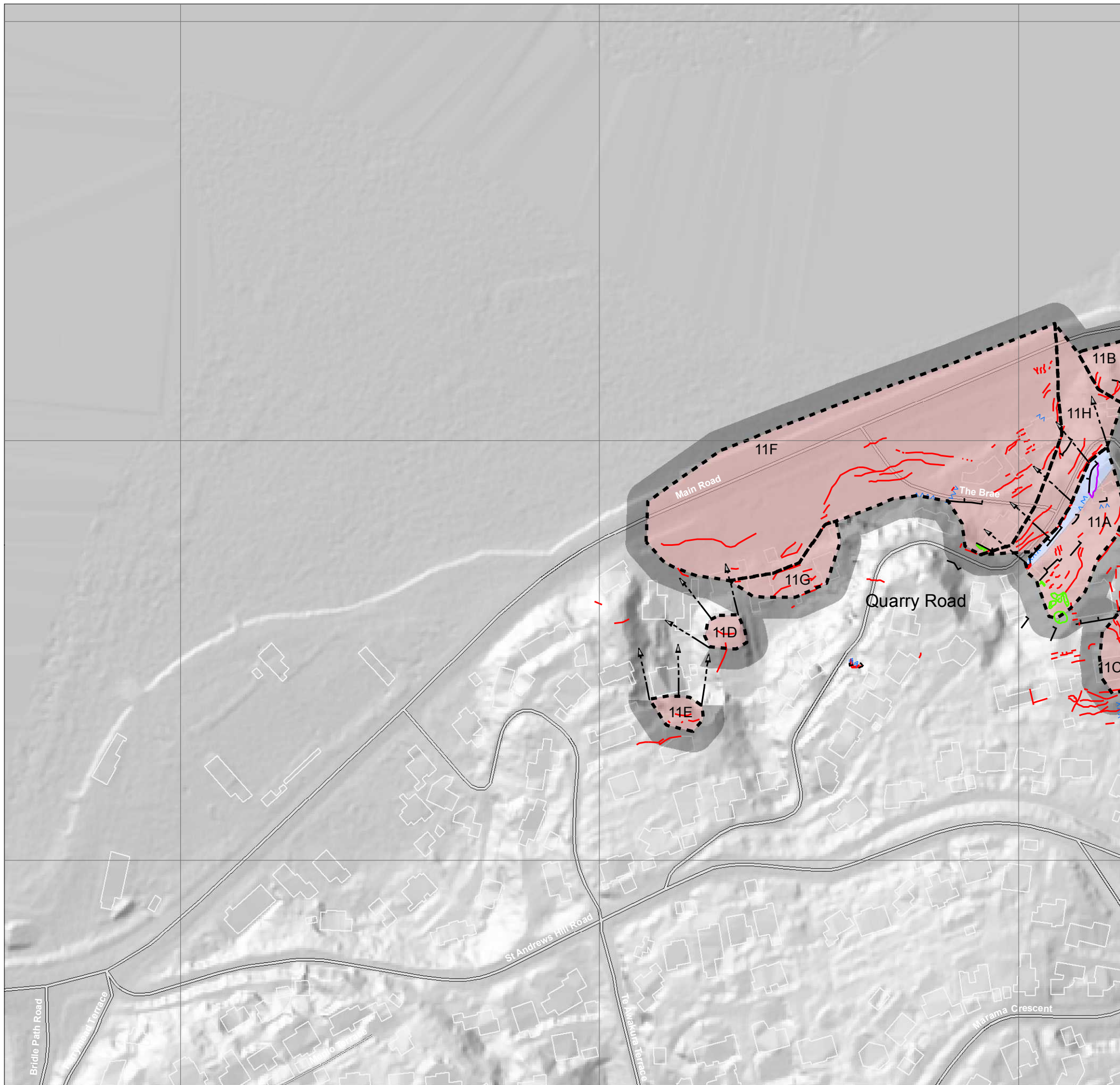
5177400

5177200

1576600

1576800

1577000



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

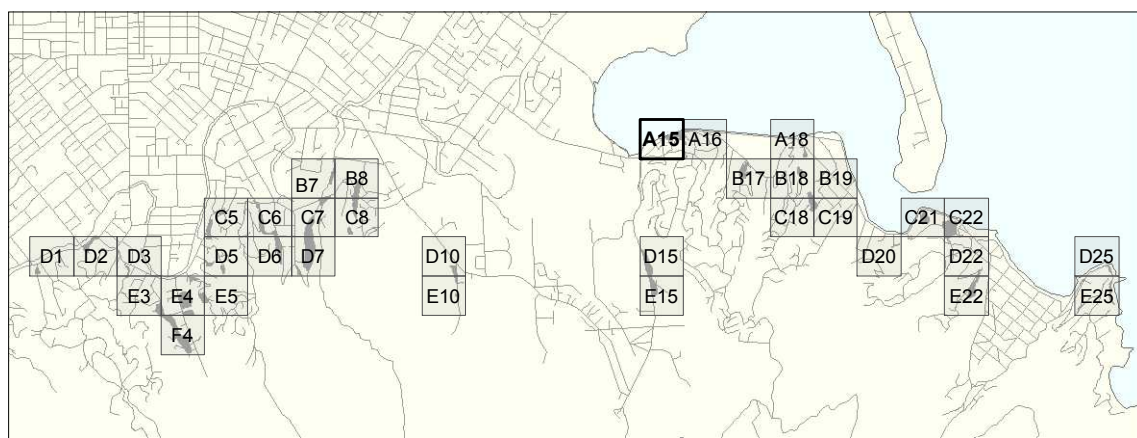
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



SCALE BAR: 0 50 100 m

**EXPLANATION:**

Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012). PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map A15**

REPORT: CR2012/317 DATE: July 2013

5177600

5177400

5177200

1577200

1577400



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

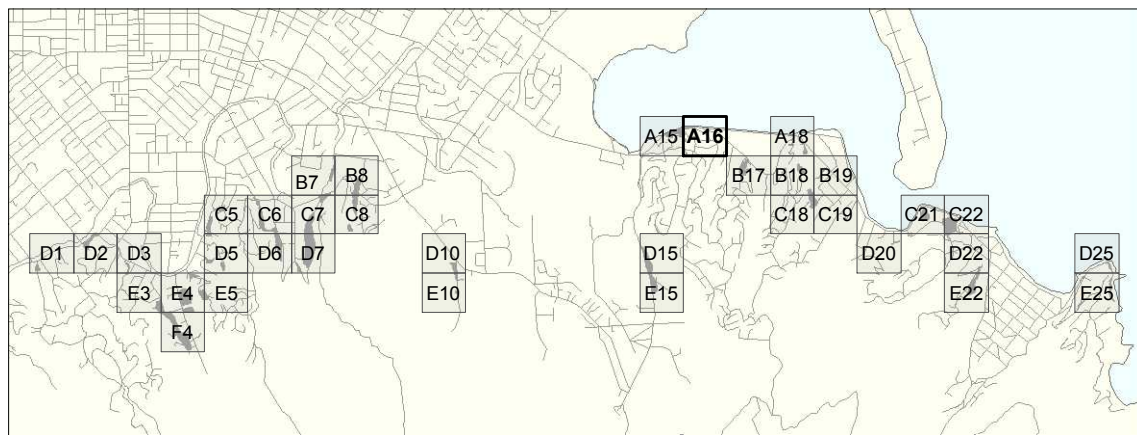
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



SCALE BAR: 0 50 100 m

**EXPLANATION:**

Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012). PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map A16**

REPORT: CR2012/317 DATE: July 2013

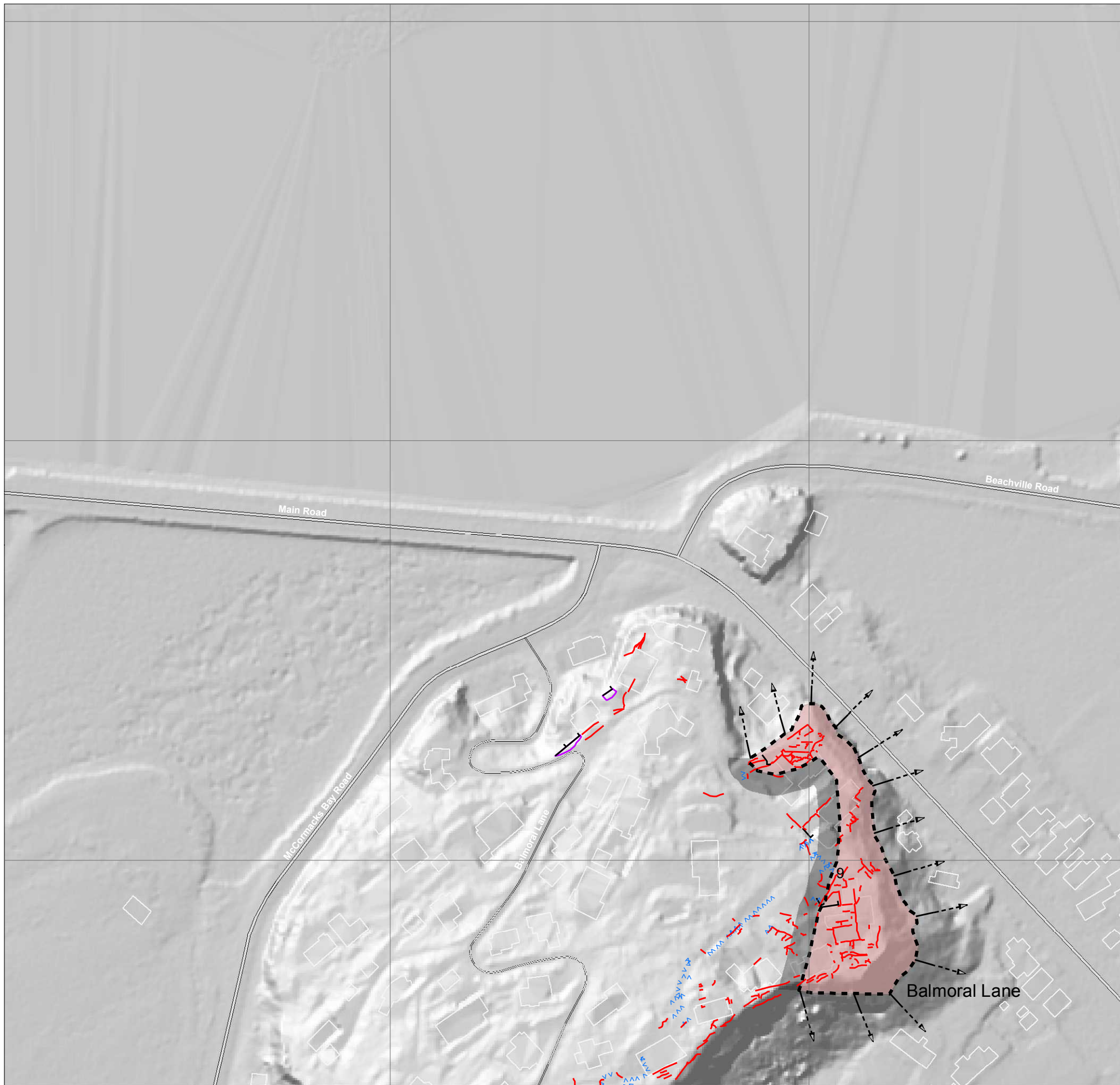
5177600

5177400

5177200

1578200

1578400



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

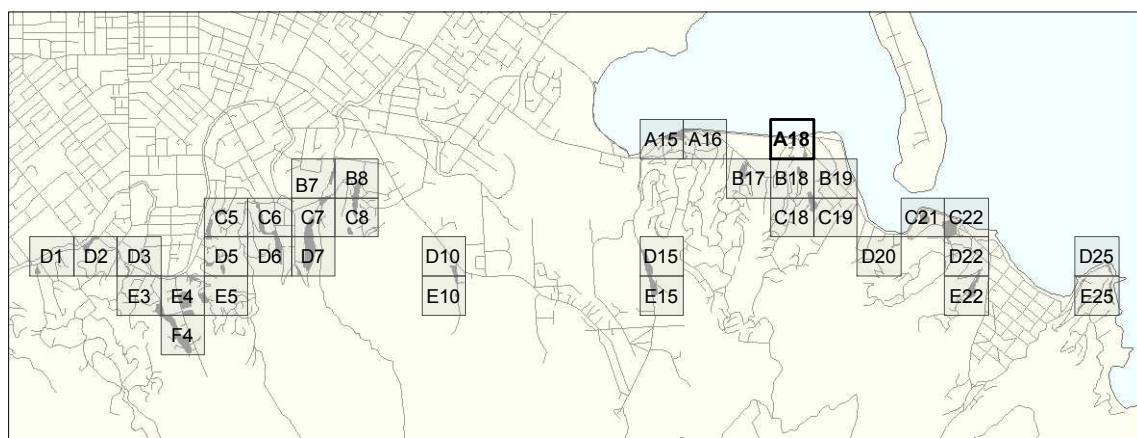
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map A18**

REPORT: CR2012/317    DATE: July 2013



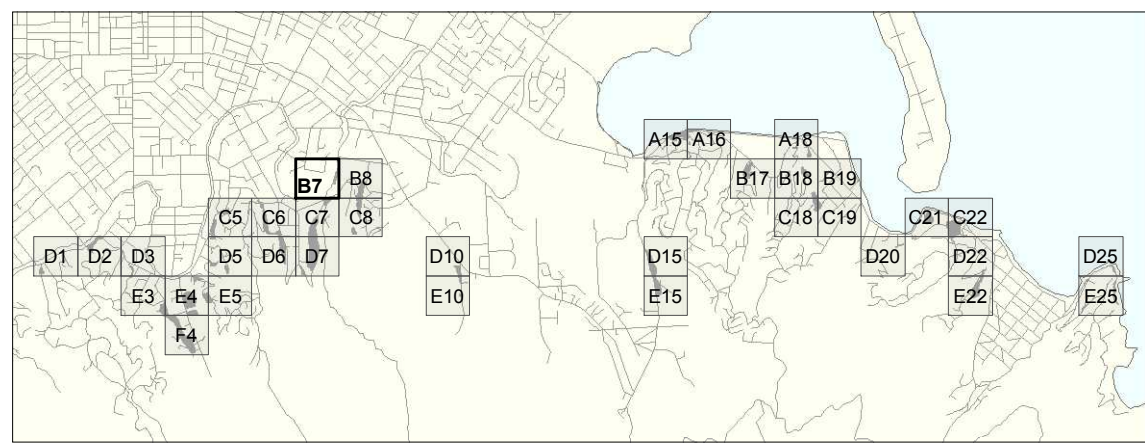
- Surface deformation\***
- Tension crack
  - Complex zone of cracking
  - Subsidence
  - ~~~~~ Compression zone
  - Tunnel gully
  - Tilted/deformed retaining wall/fence
  - Spring

- Current mass movements**
- Inferred mass movement boundary (June 2013)
  - Mainly extensional area
  - Mainly translational area
  - Mainly compressional area
- Potential future enlargement of mass movements**
- 10 m enlargement area
  - Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



**EXPLANATION:**  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

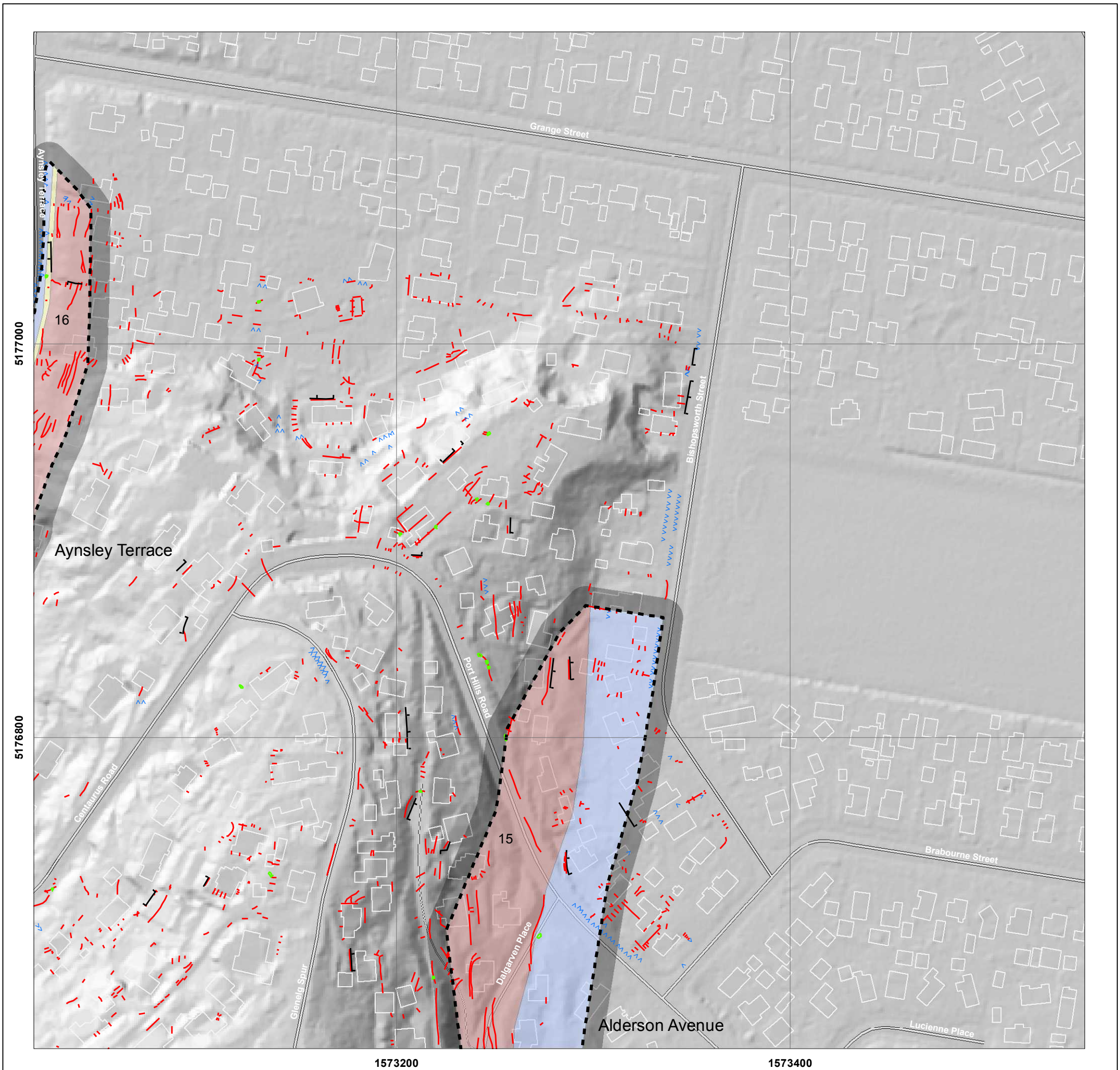
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map B7**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

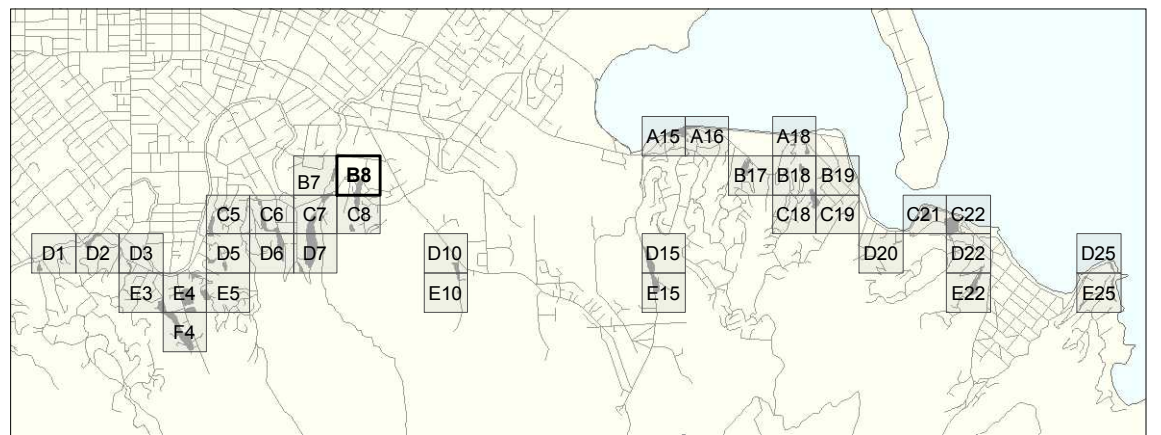
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.

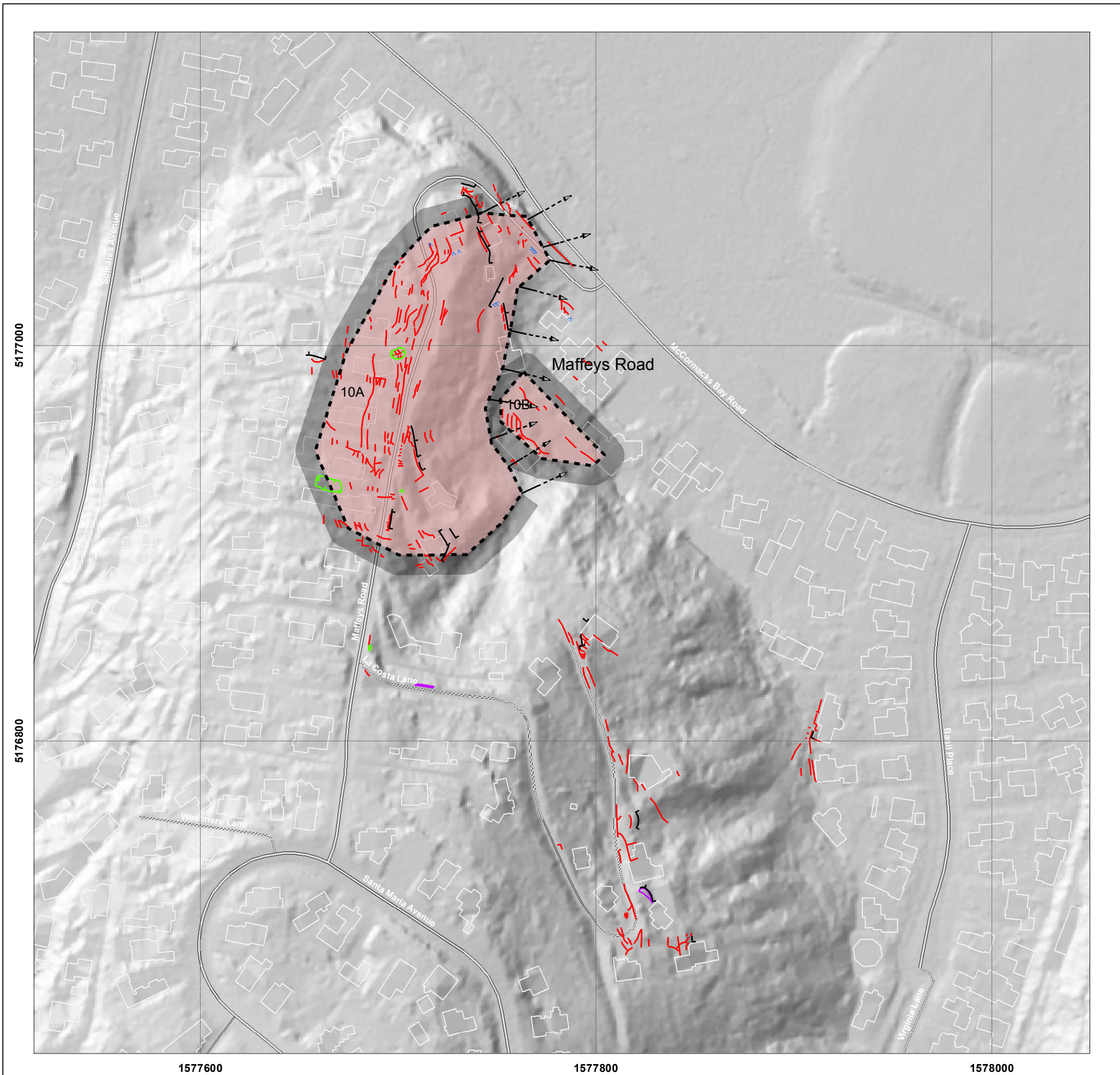


EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



<b>STAGE 1: MASS MOVEMENTS</b>		<b>Appendix 2</b>	
<b>Port Hills Christchurch</b>		<b>FINAL</b>	
<b>Map B8</b>		<b>Map B8</b>	
REPORT: CR2012/317	DATE: July 2013		



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

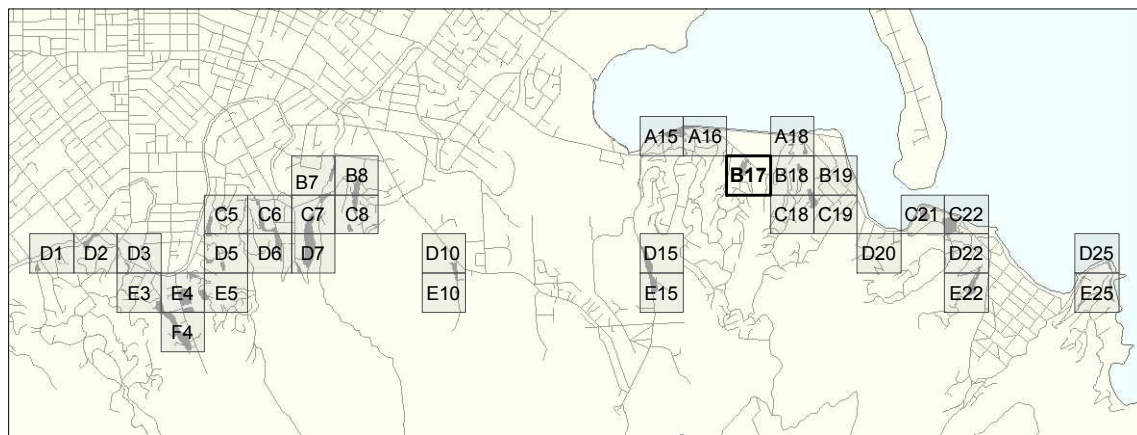
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

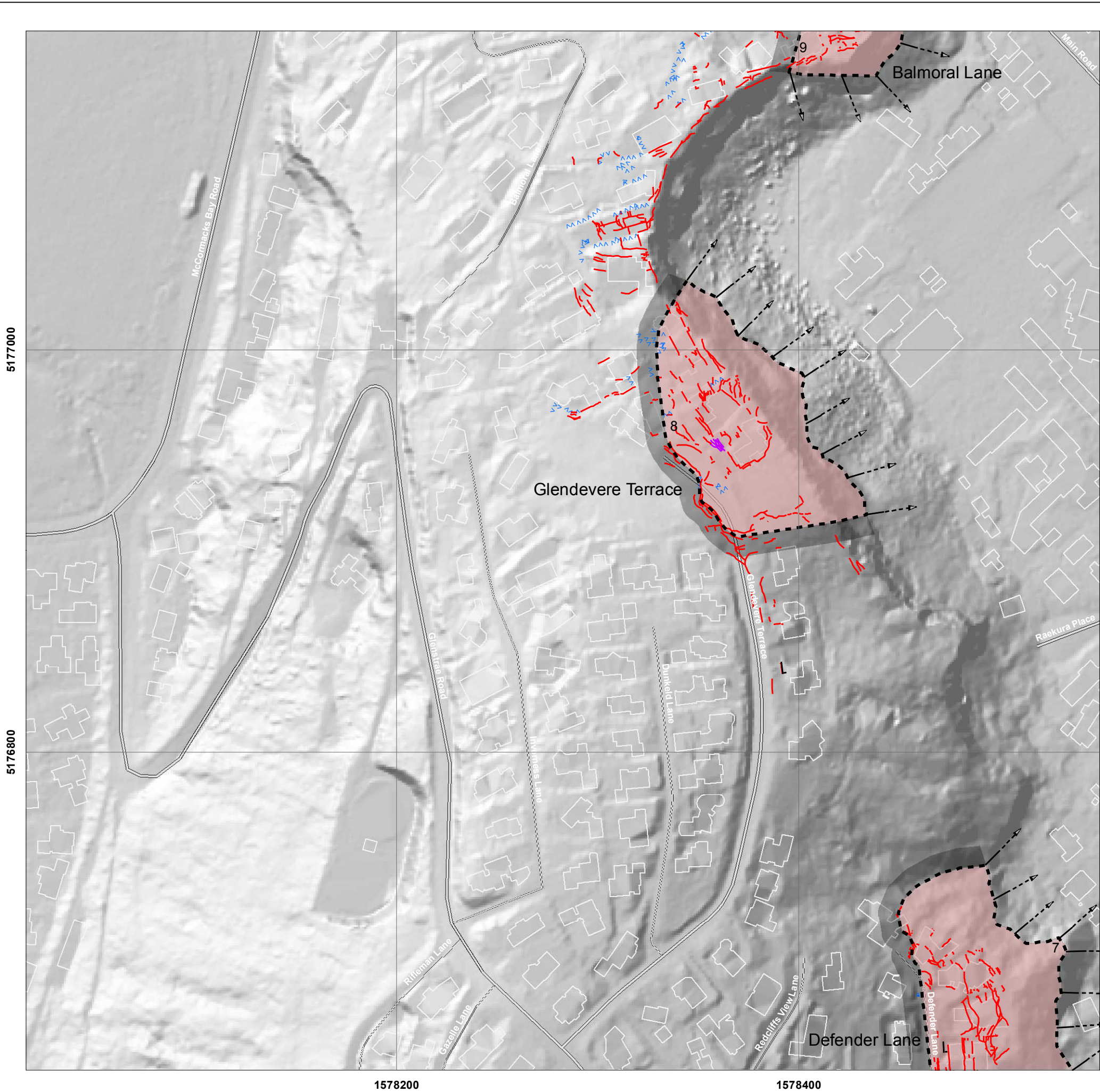
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map B17**

REPORT: CR2012/317    DATE: July 2013



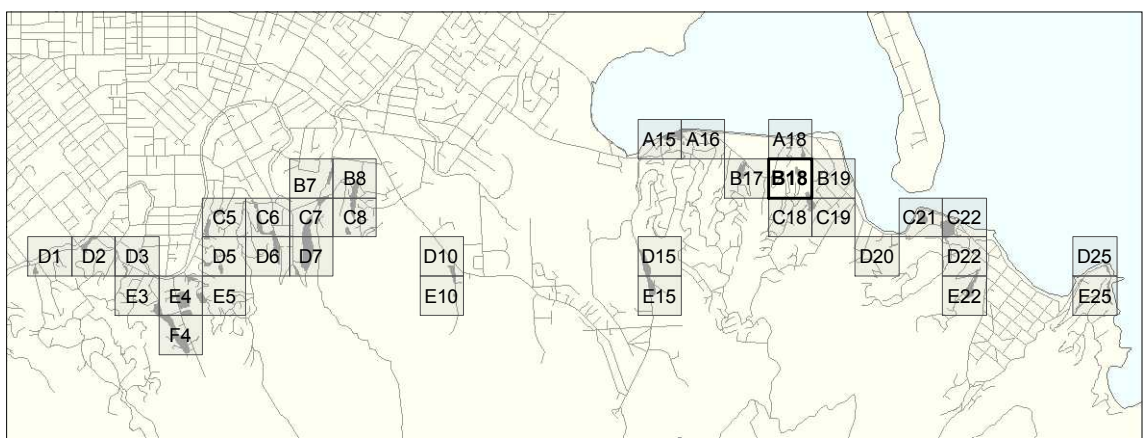
- Surface deformation\***
- Tension crack
  - Complex zone of cracking
  - Subsidence
  - ~~~~~ Compression zone
  - Tunnel gully
  - Tilted/deformed retaining wall/fence
  - Spring

- Current mass movements**
- Inferred mass movement boundary (June 2013)
  - Mainly extensional area
  - Mainly translational area
  - Mainly compressional area
- Potential future enlargement of mass movements**
- 10 m enlargement area
  - Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



**EXPLANATION:**  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map B18**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

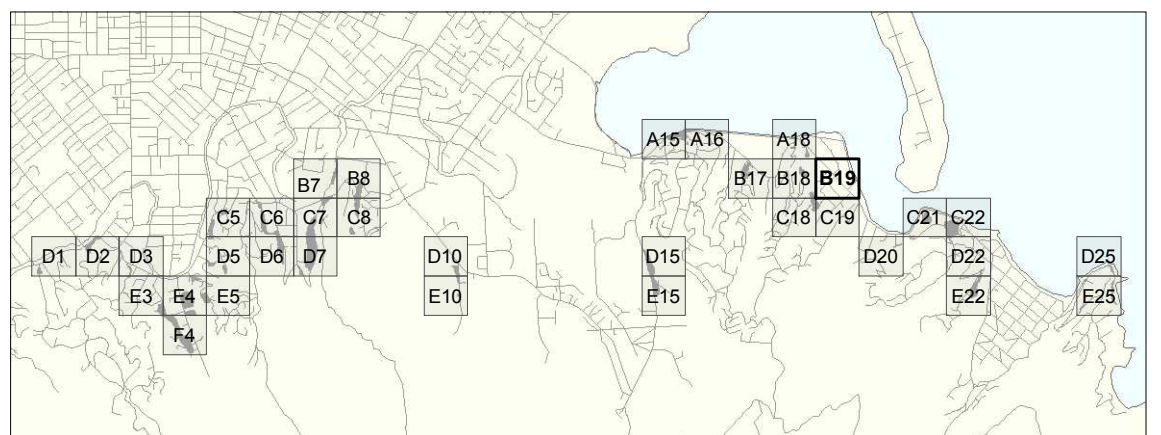
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills  
Christchurch**

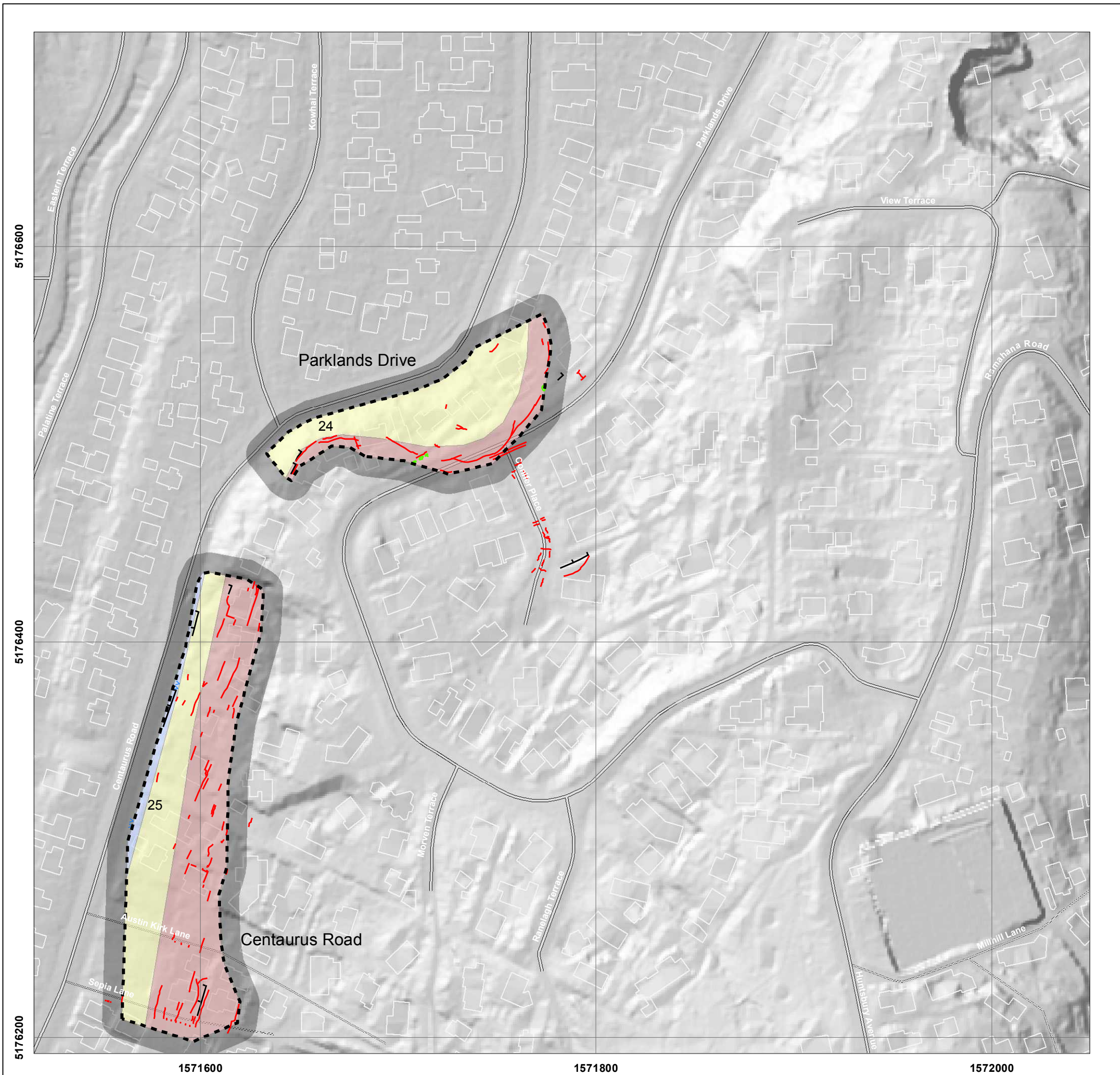
**Appendix 2**

**FINAL**

**Map B19**

REPORT: CR2012/317    DATE: July 2013





**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

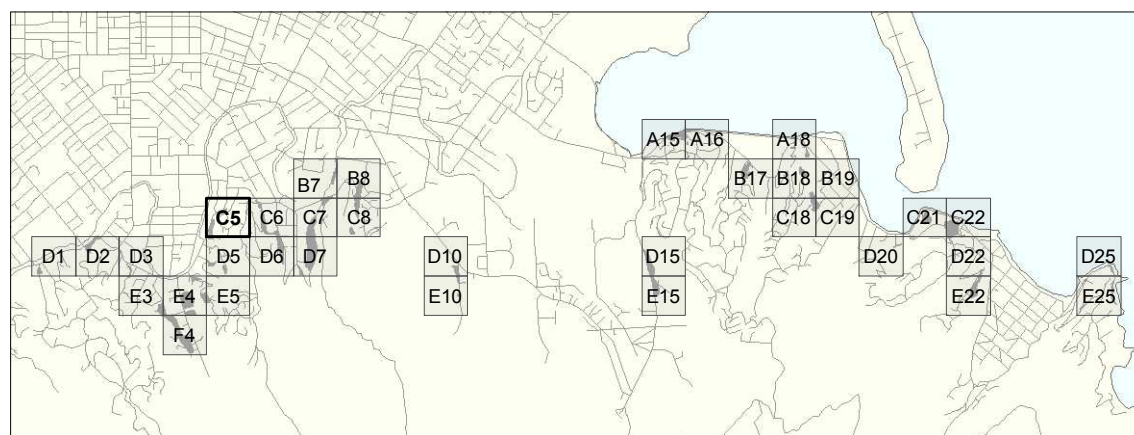
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

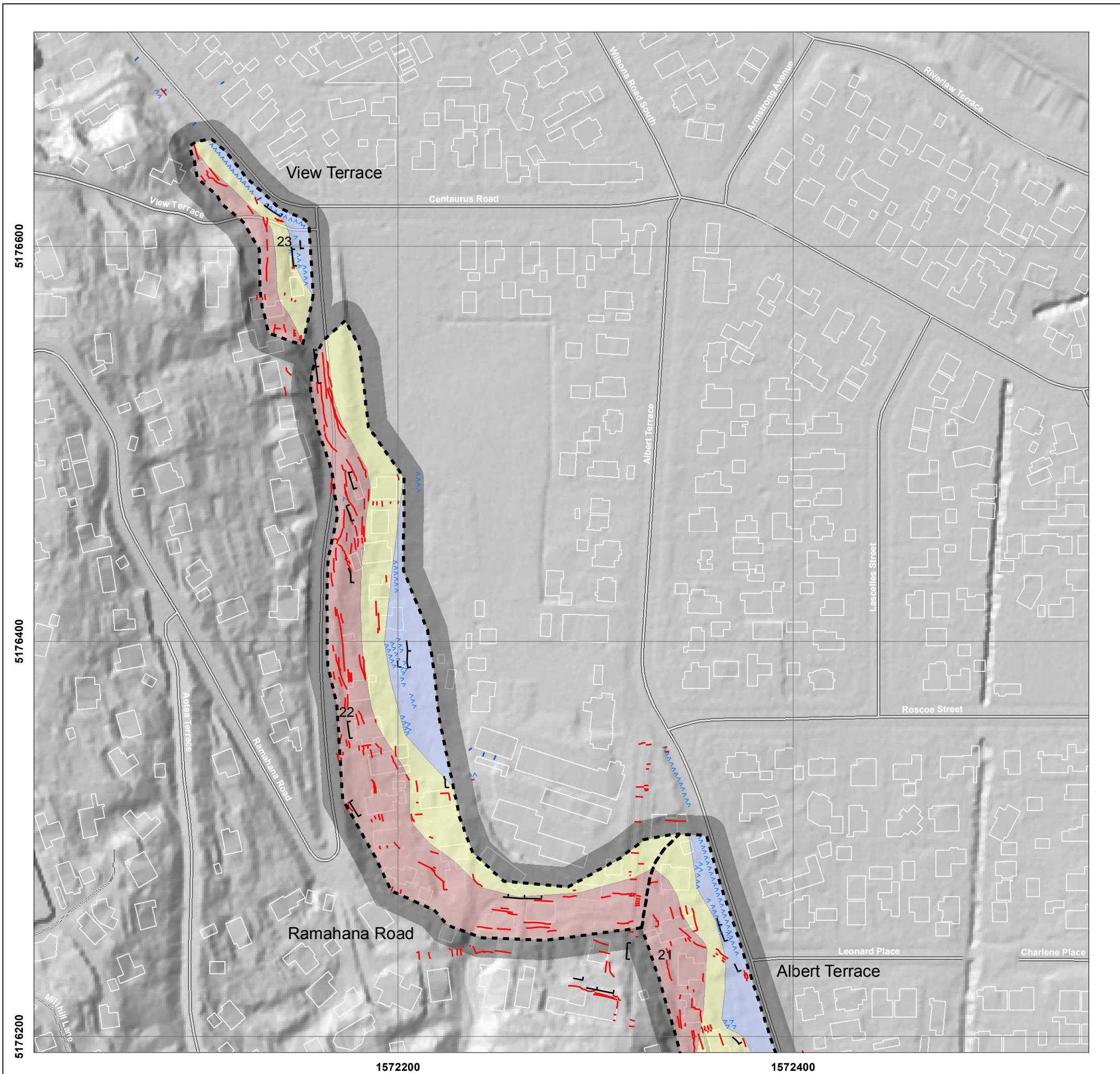
**Port Hills  
 Christchurch**

**Appendix 2**

**FINAL**

**Map C5**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

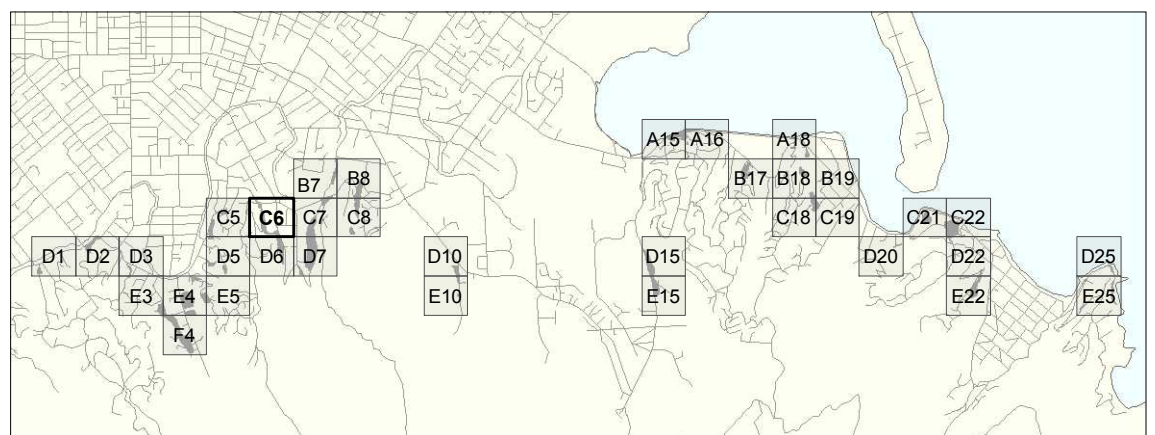
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

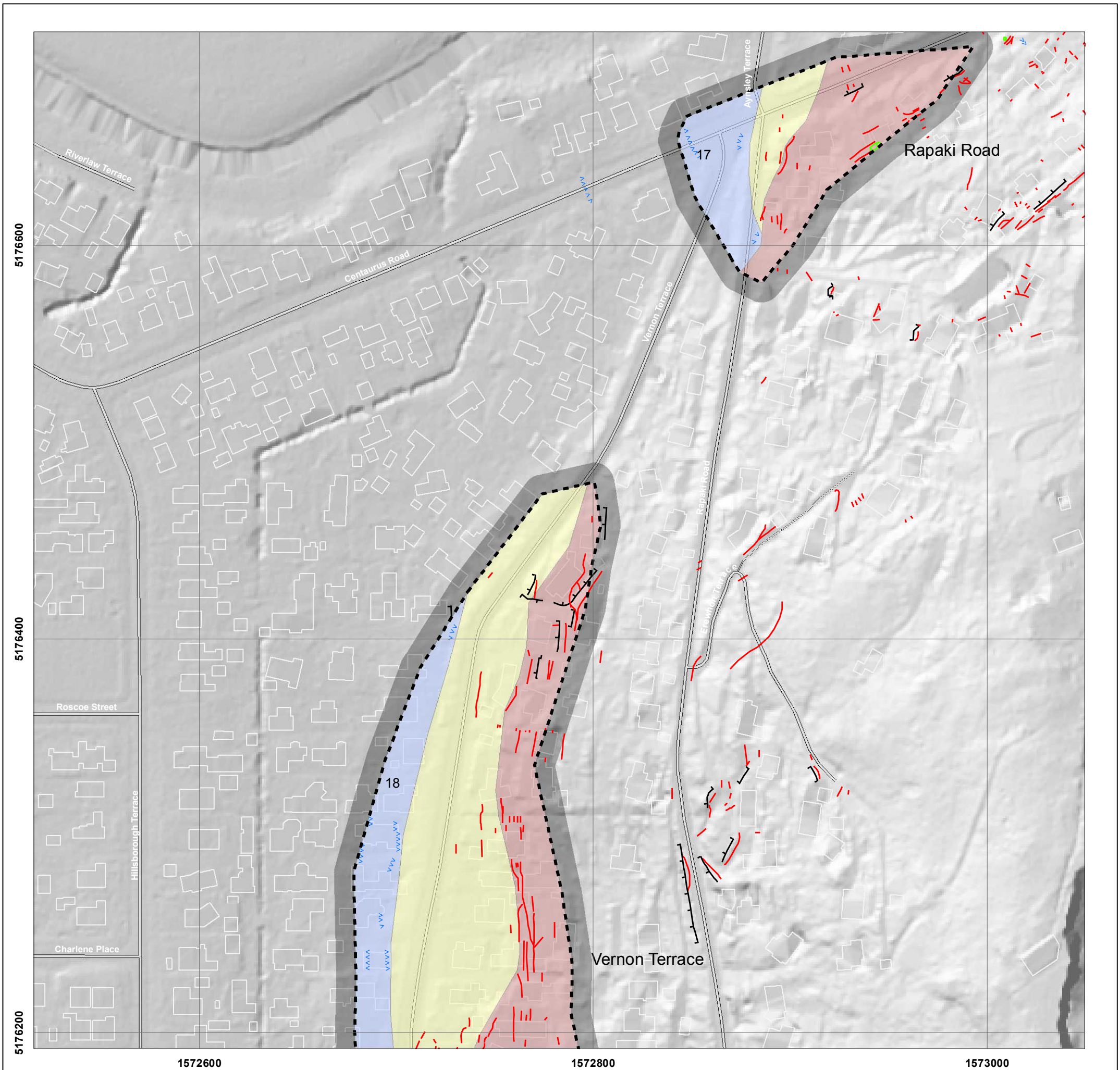
**Port Hills  
 Christchurch**

**Appendix 2**

**FINAL**

**Map C6**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

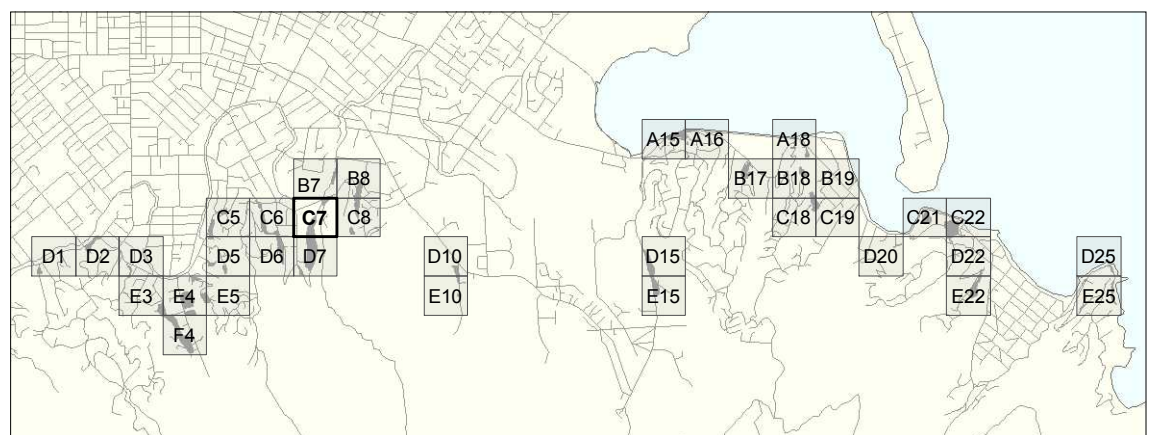
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

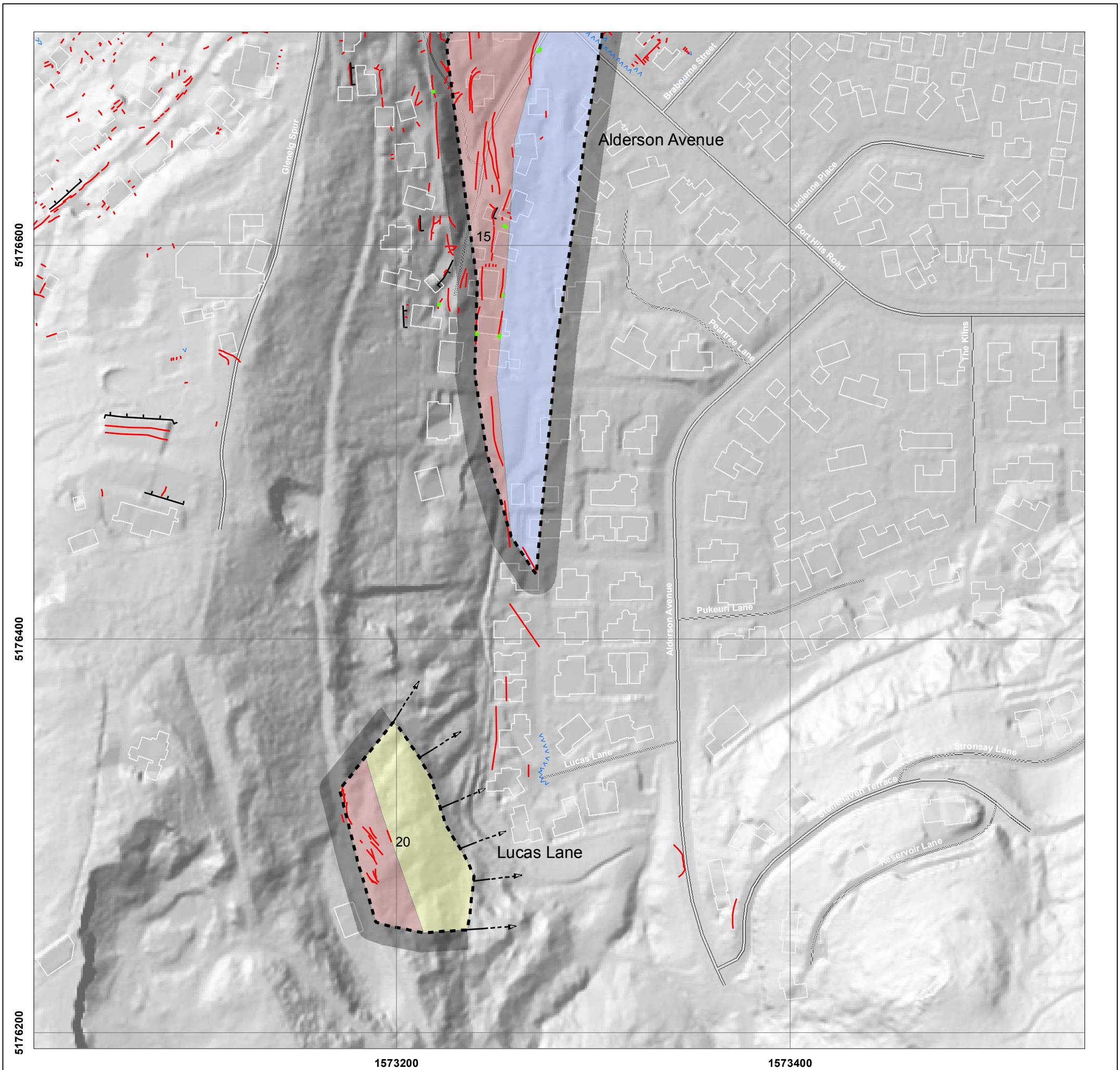
**Port Hills  
 Christchurch**

**Appendix 2**

**FINAL**

**Map C7**

REPORT: CR2012/317 DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

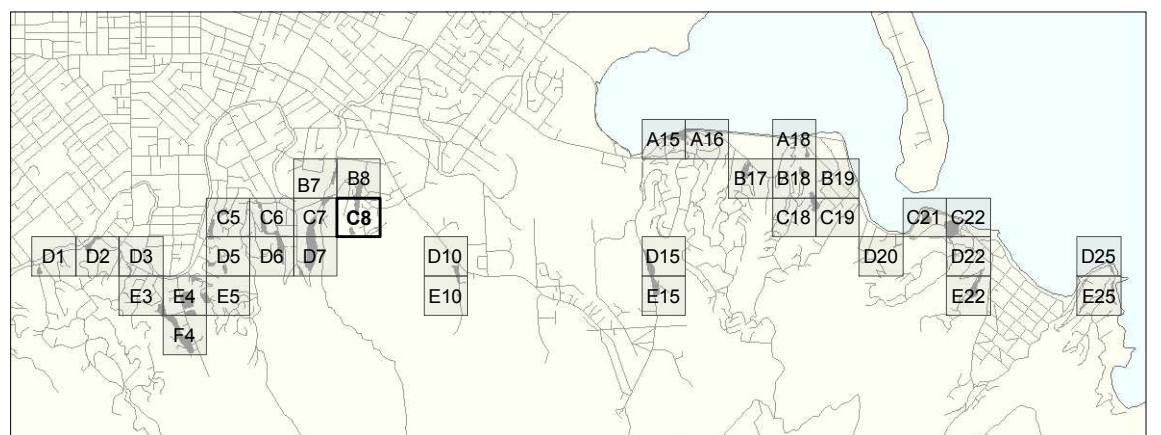
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

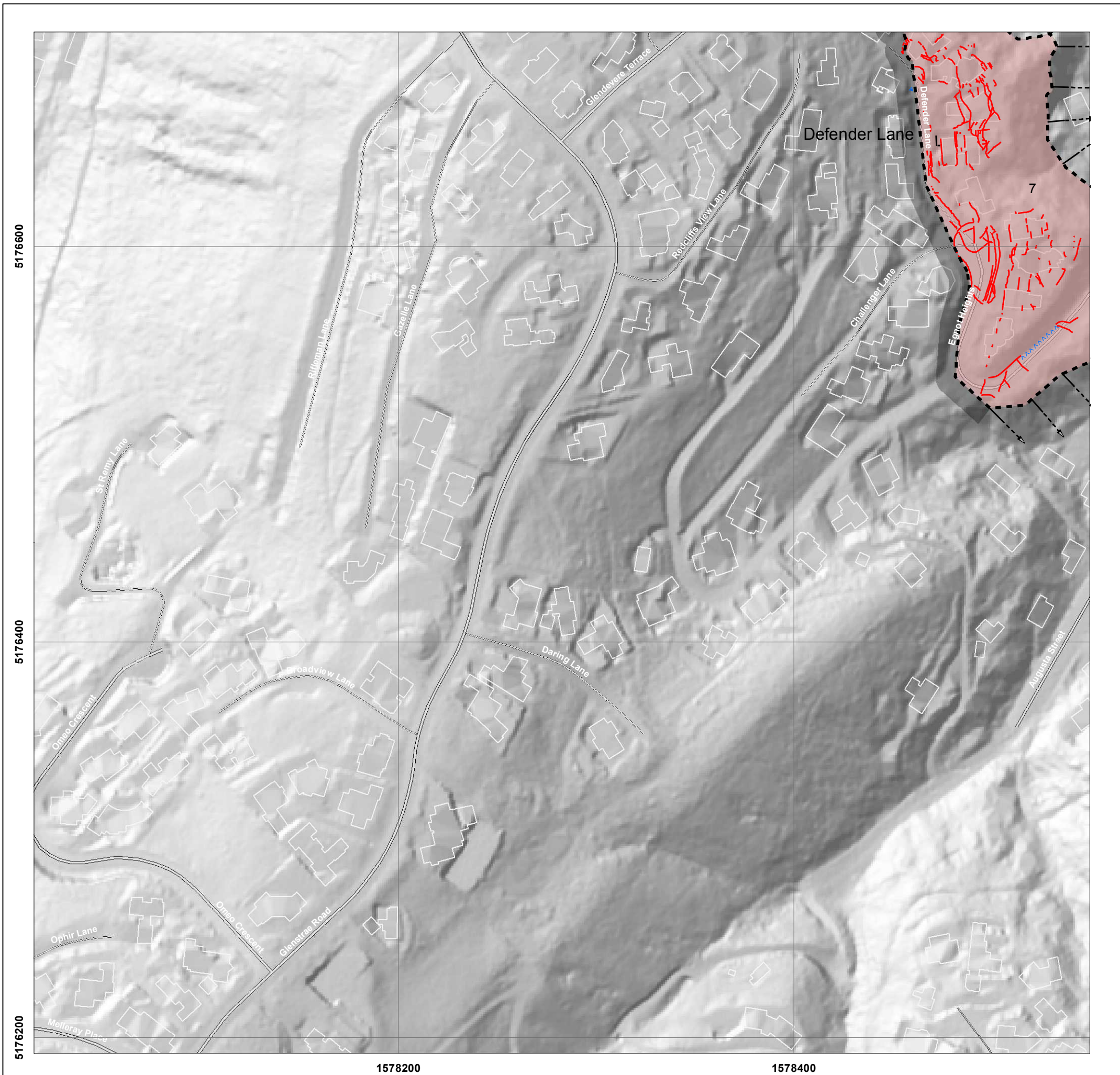
**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map C8**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

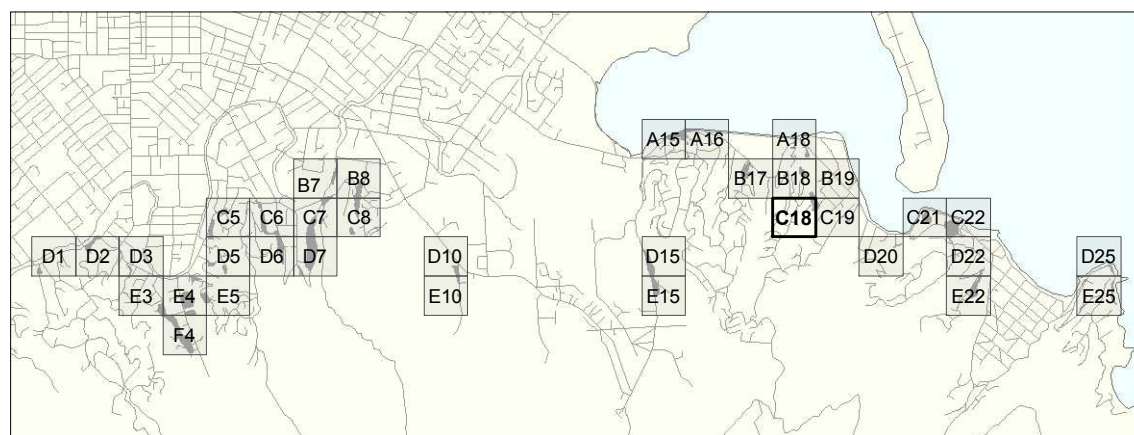
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

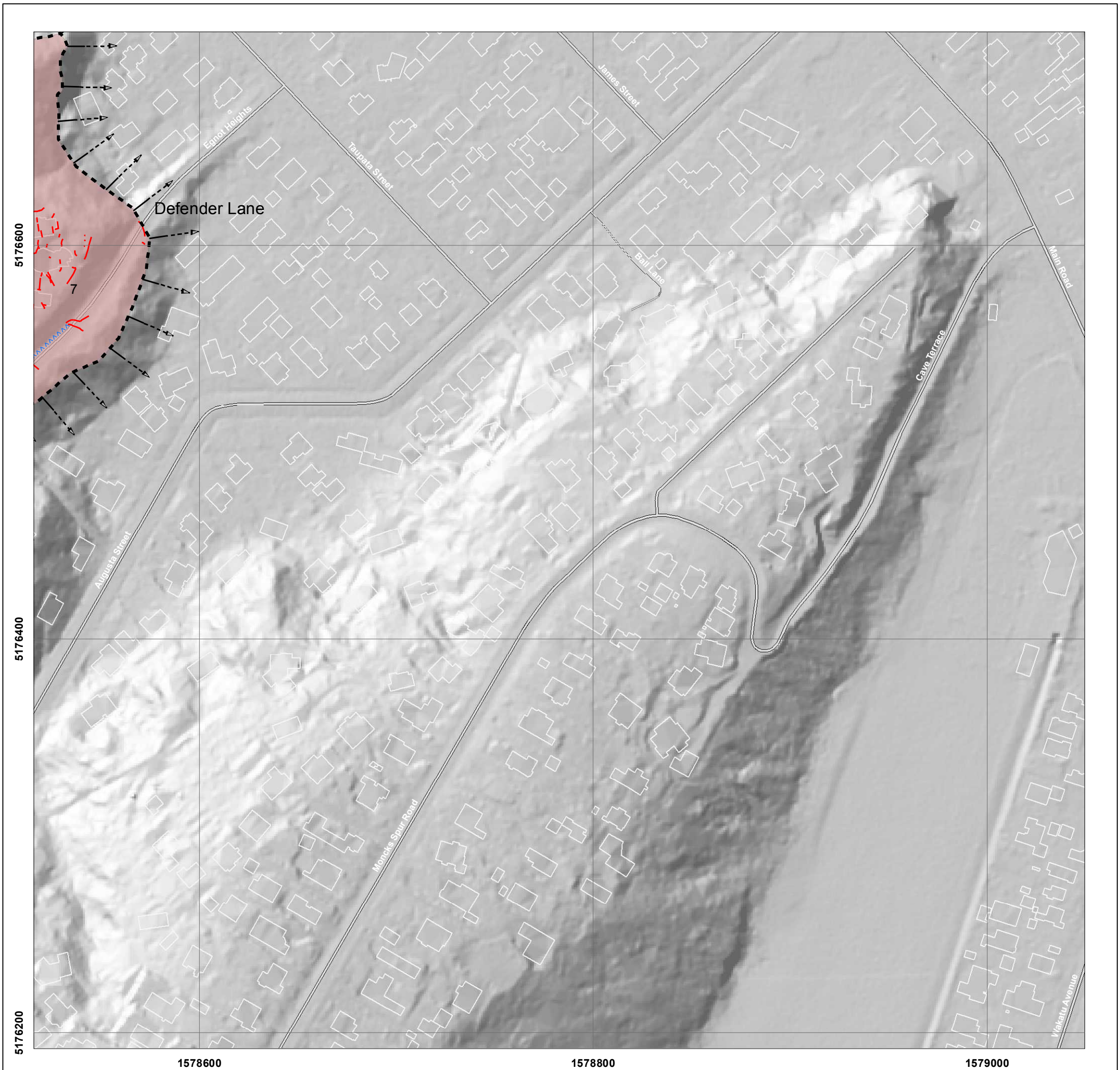
**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map C18**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

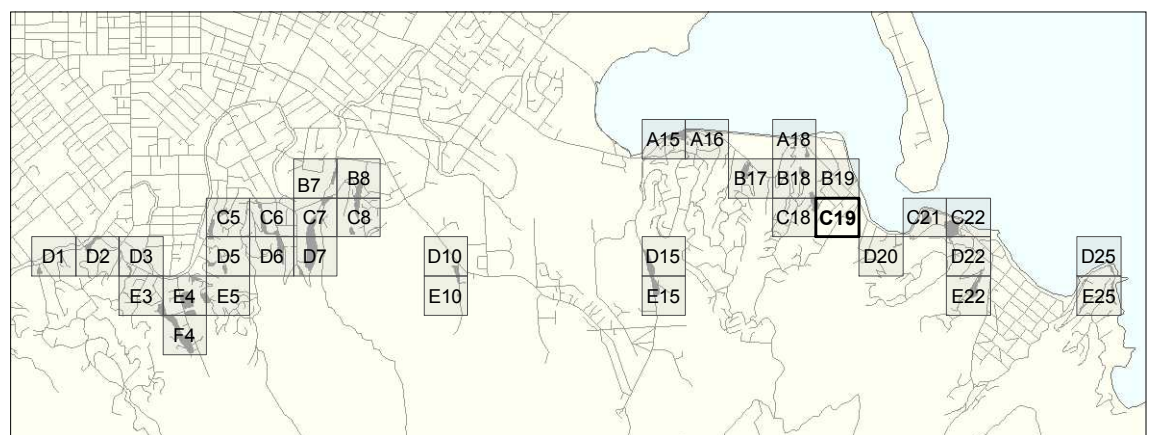
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

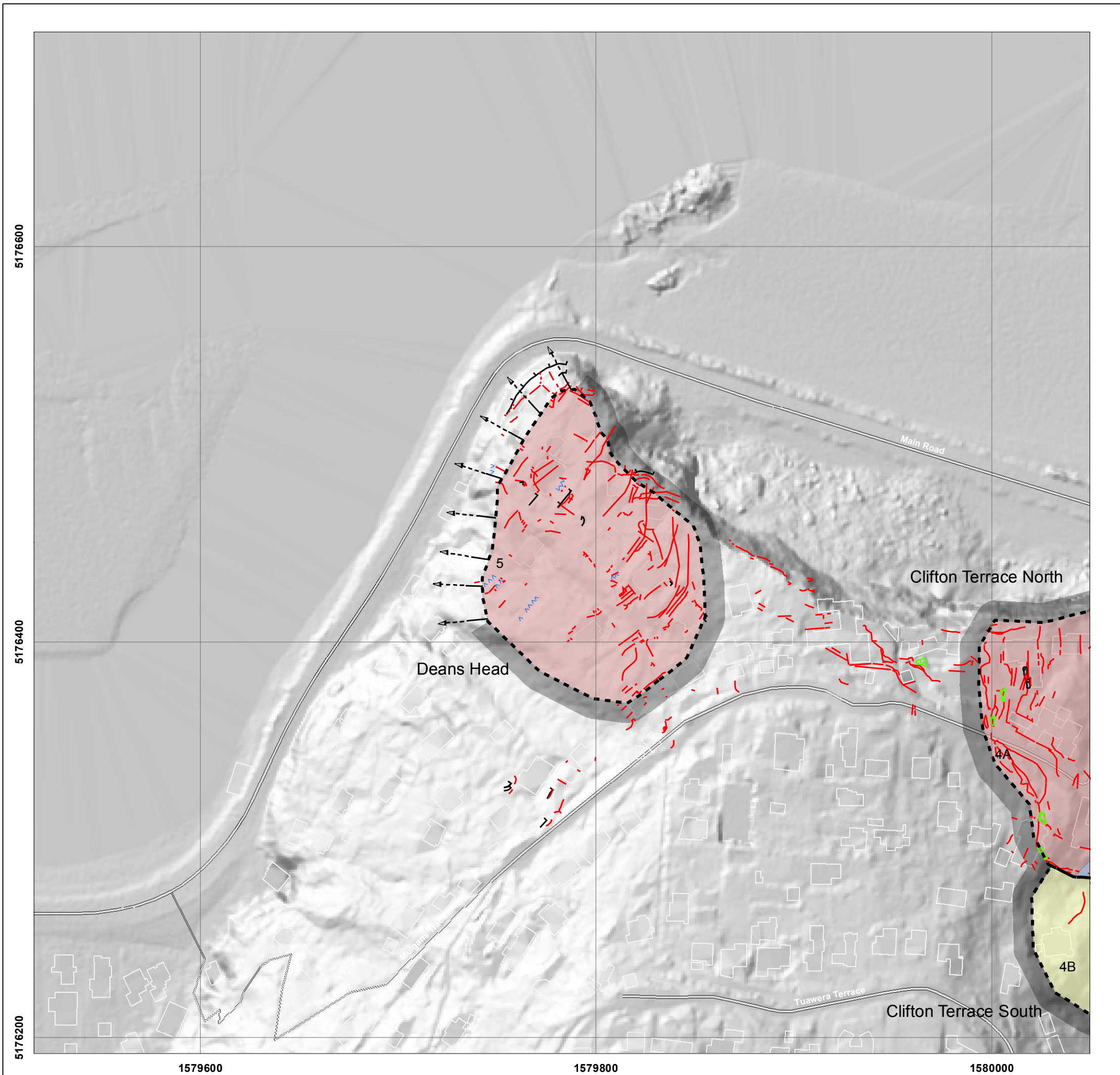
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map C19**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

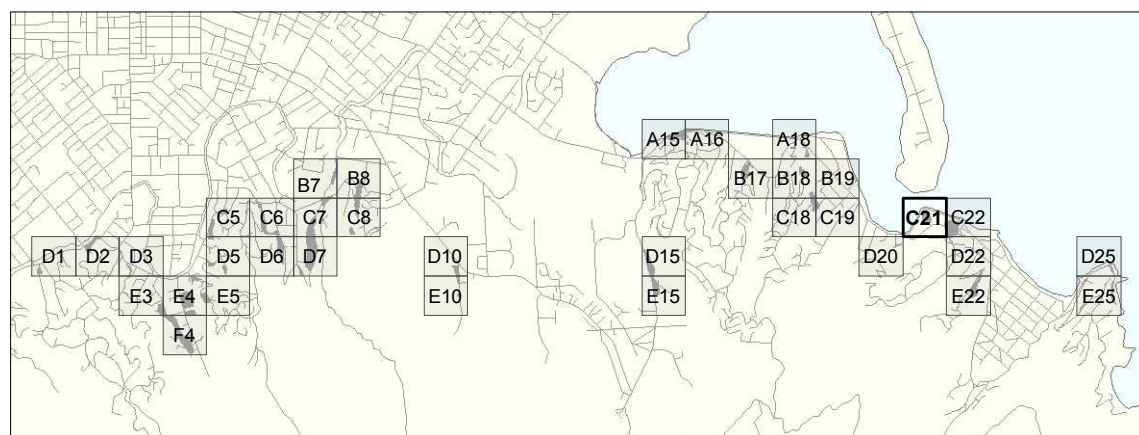
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map C21**

REPORT: CR2012/317    DATE: July 2013

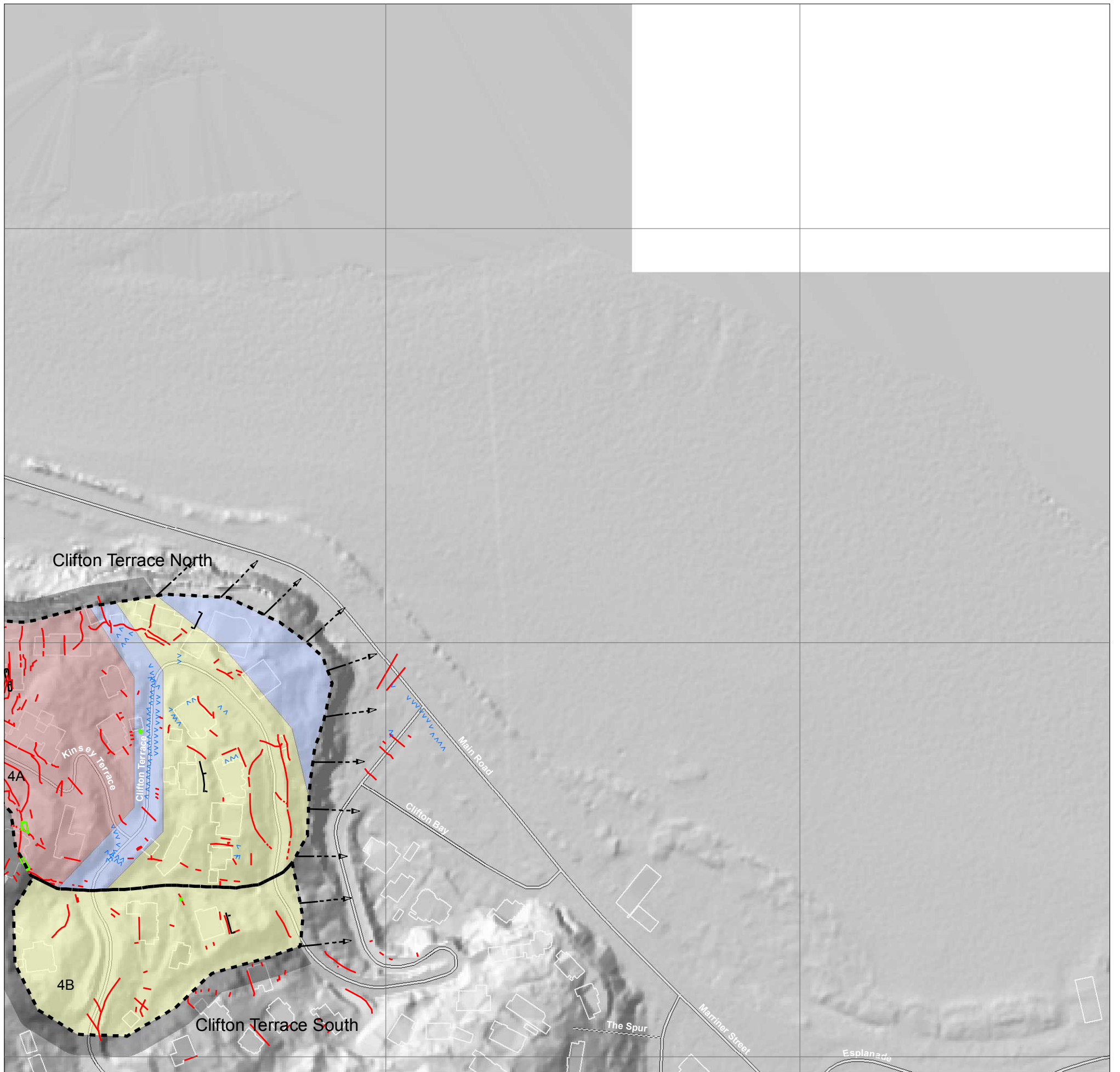
5176600

5176400

5176200

1580200

1580400



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

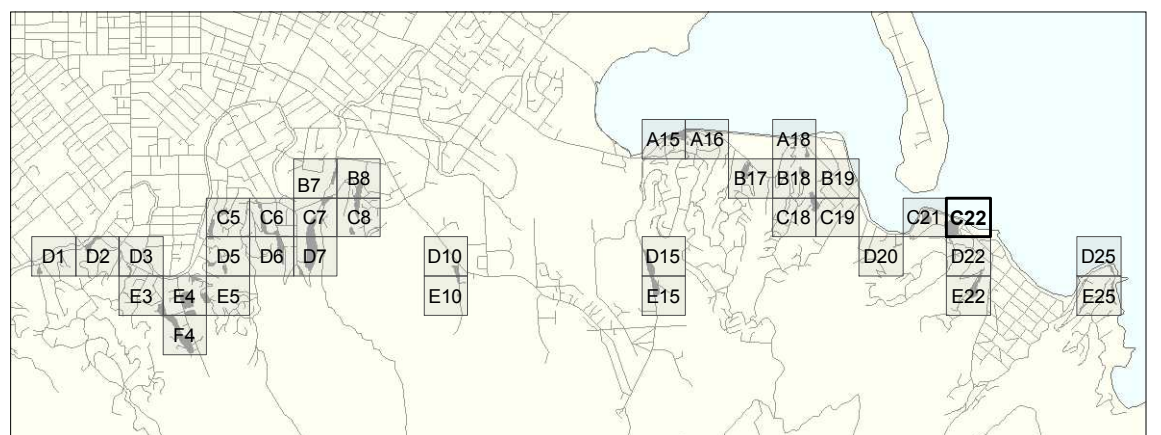
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



SCALE BAR: 0 50 100 m

**EXPLANATION:**

Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012). PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills  
Christchurch**

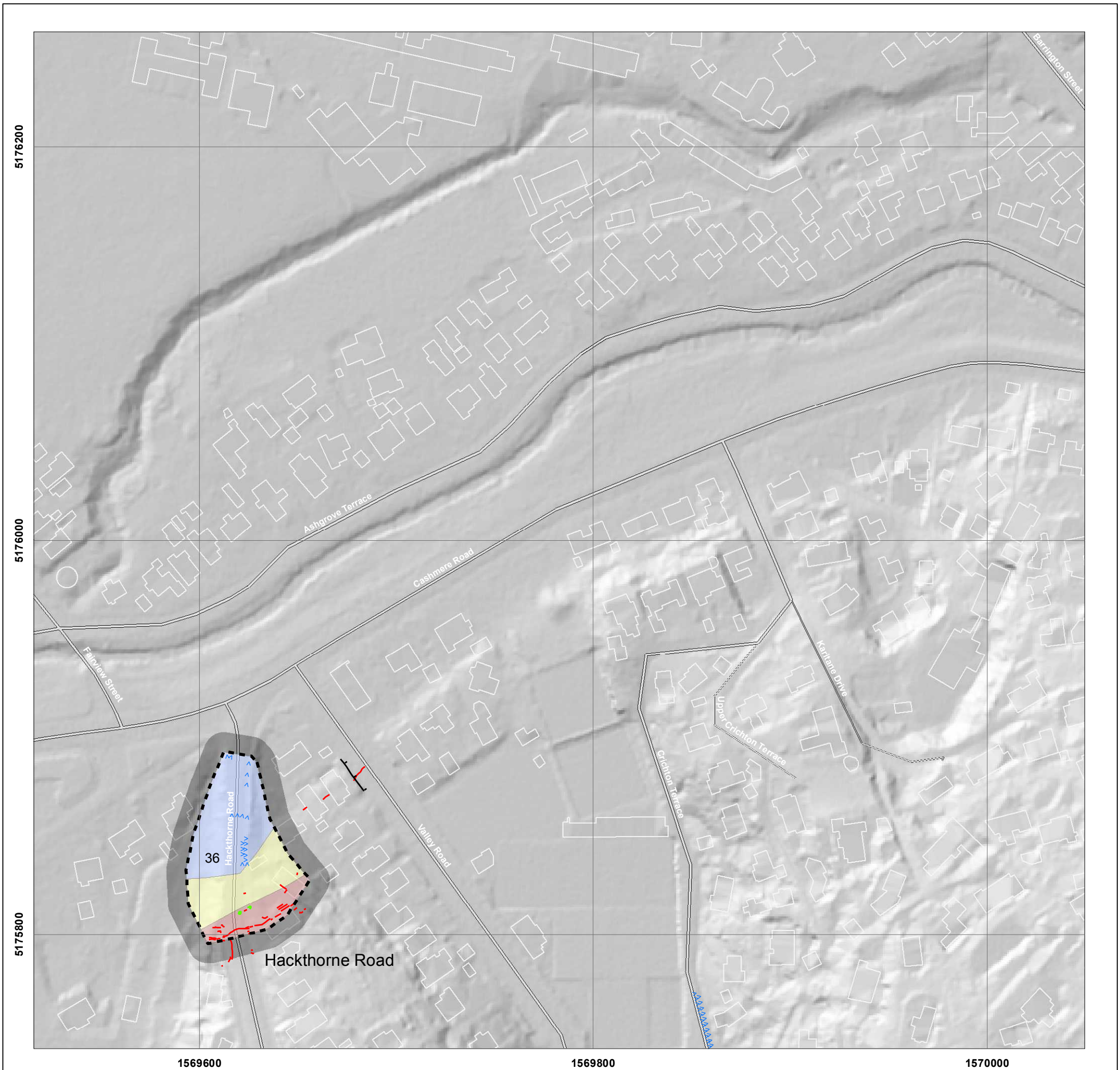
**Appendix 2**

**FINAL**

**Map C22**

REPORT: CR2012/317 DATE: July 2013





**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

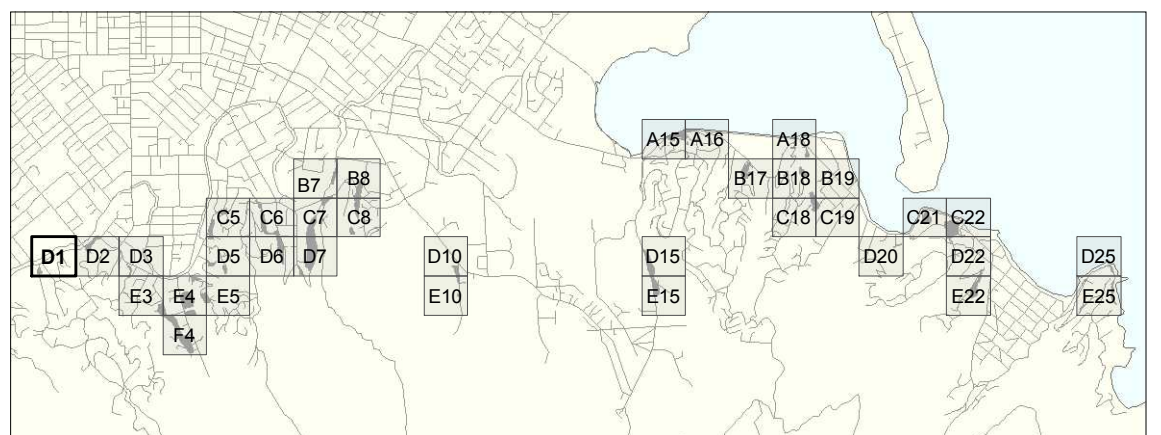
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

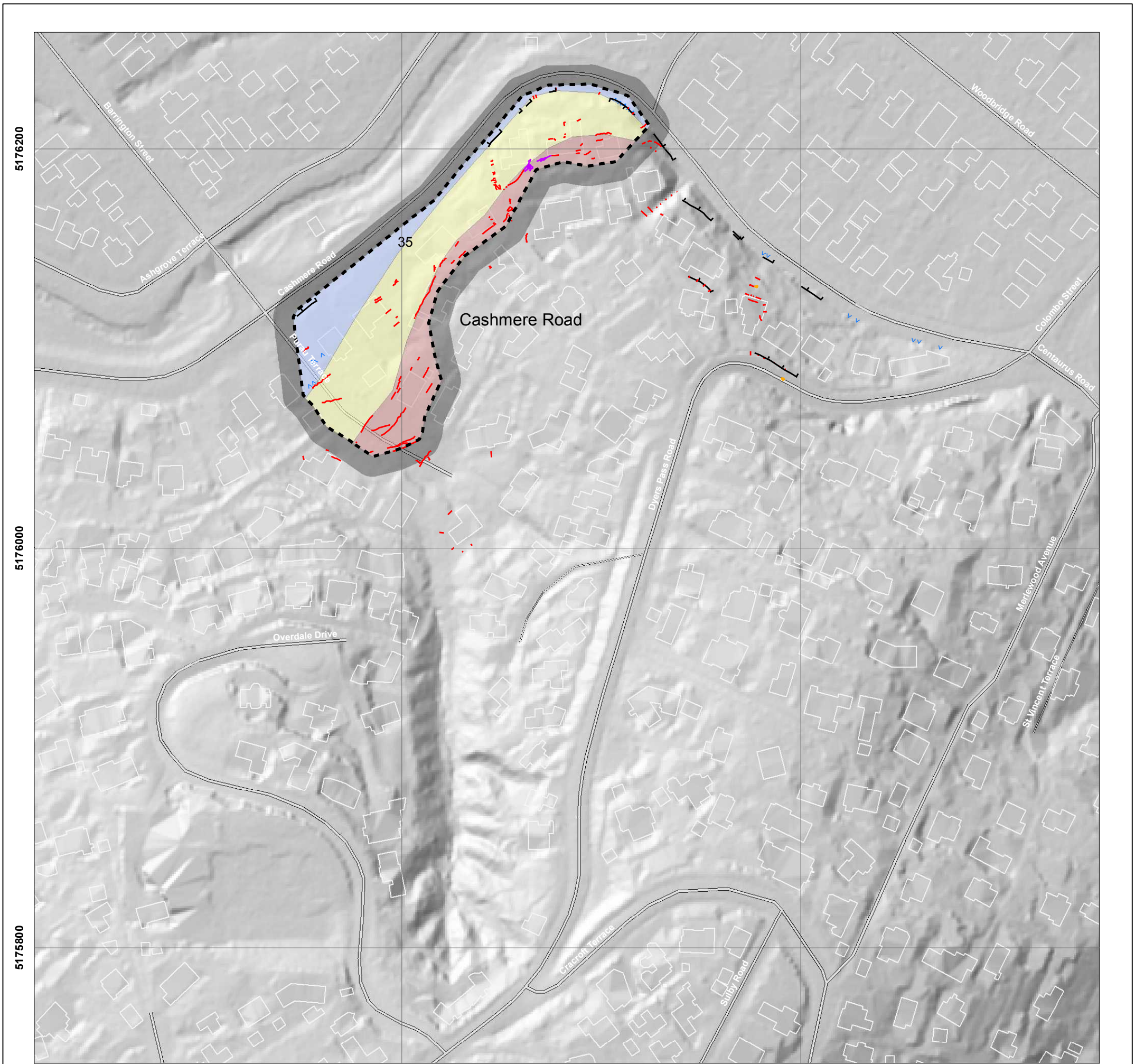
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map D1**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

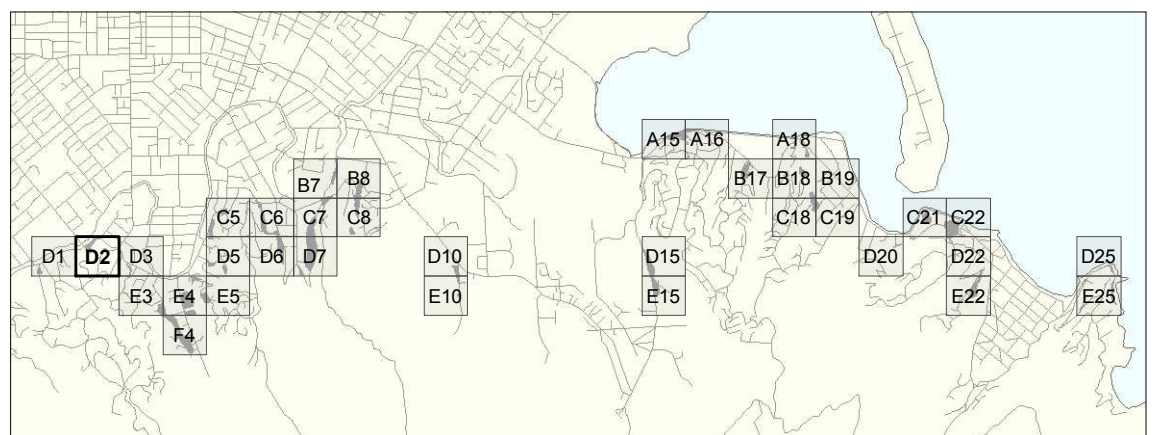
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

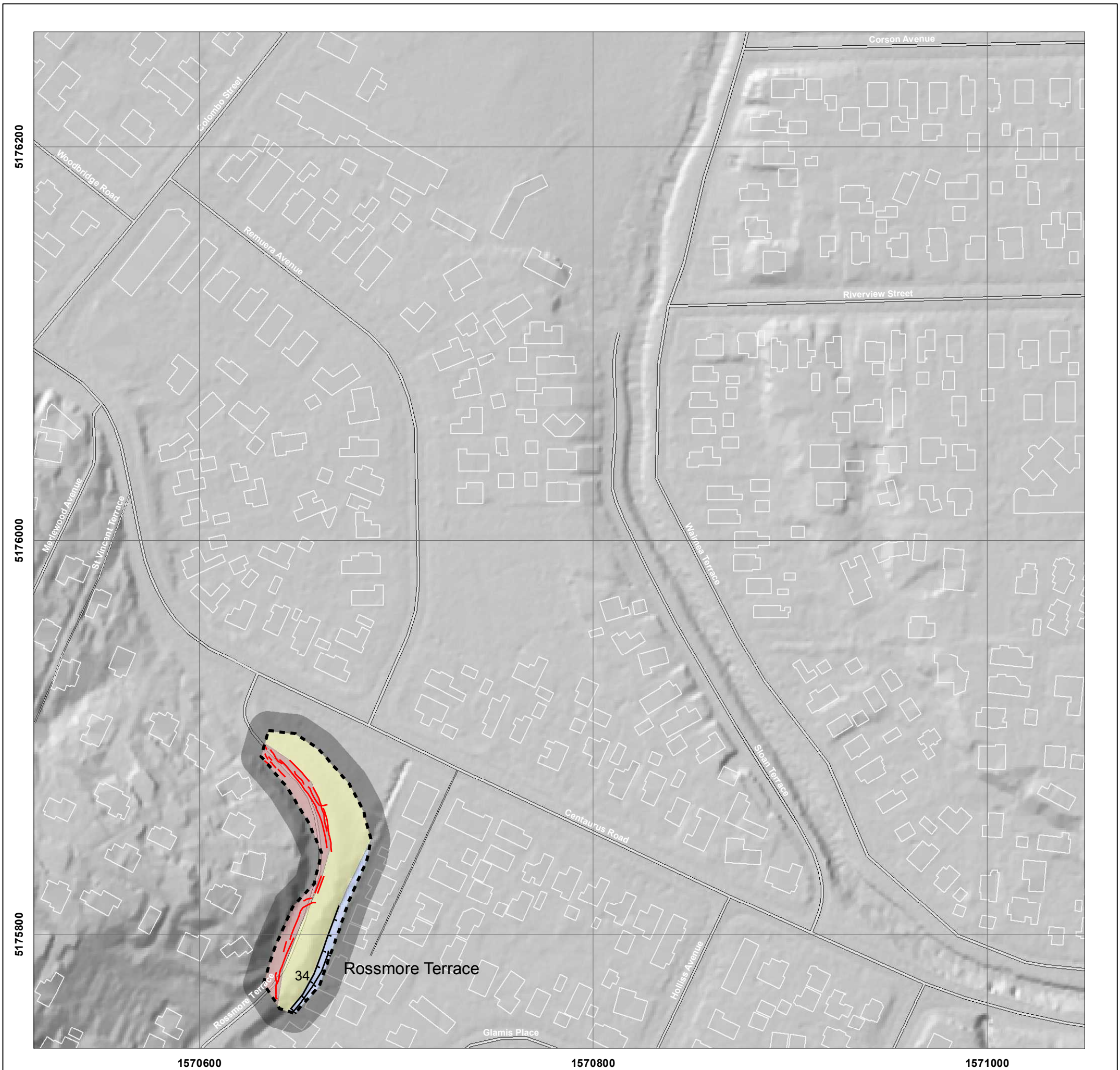
**Port Hills  
 Christchurch**

**Appendix 2**

**FINAL**

**Map D2**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

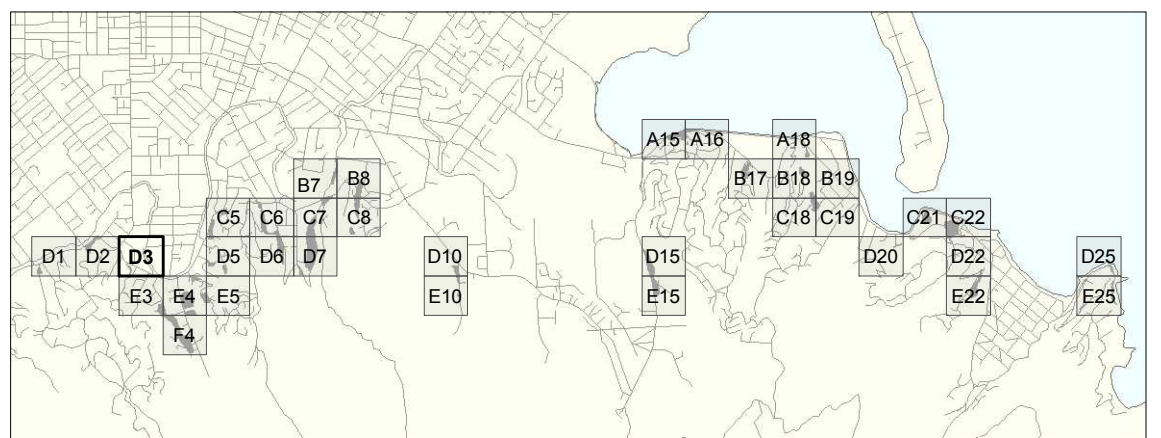
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills  
 Christchurch**

**Appendix 2**

**FINAL**

**Map D3**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

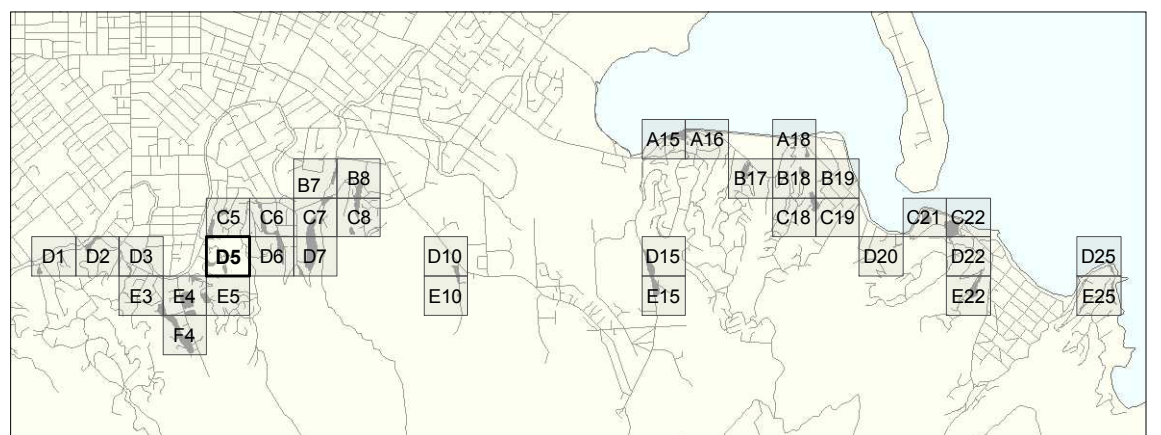
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



SCALE BAR: 0 50 100 m

**EXPLANATION:**

Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

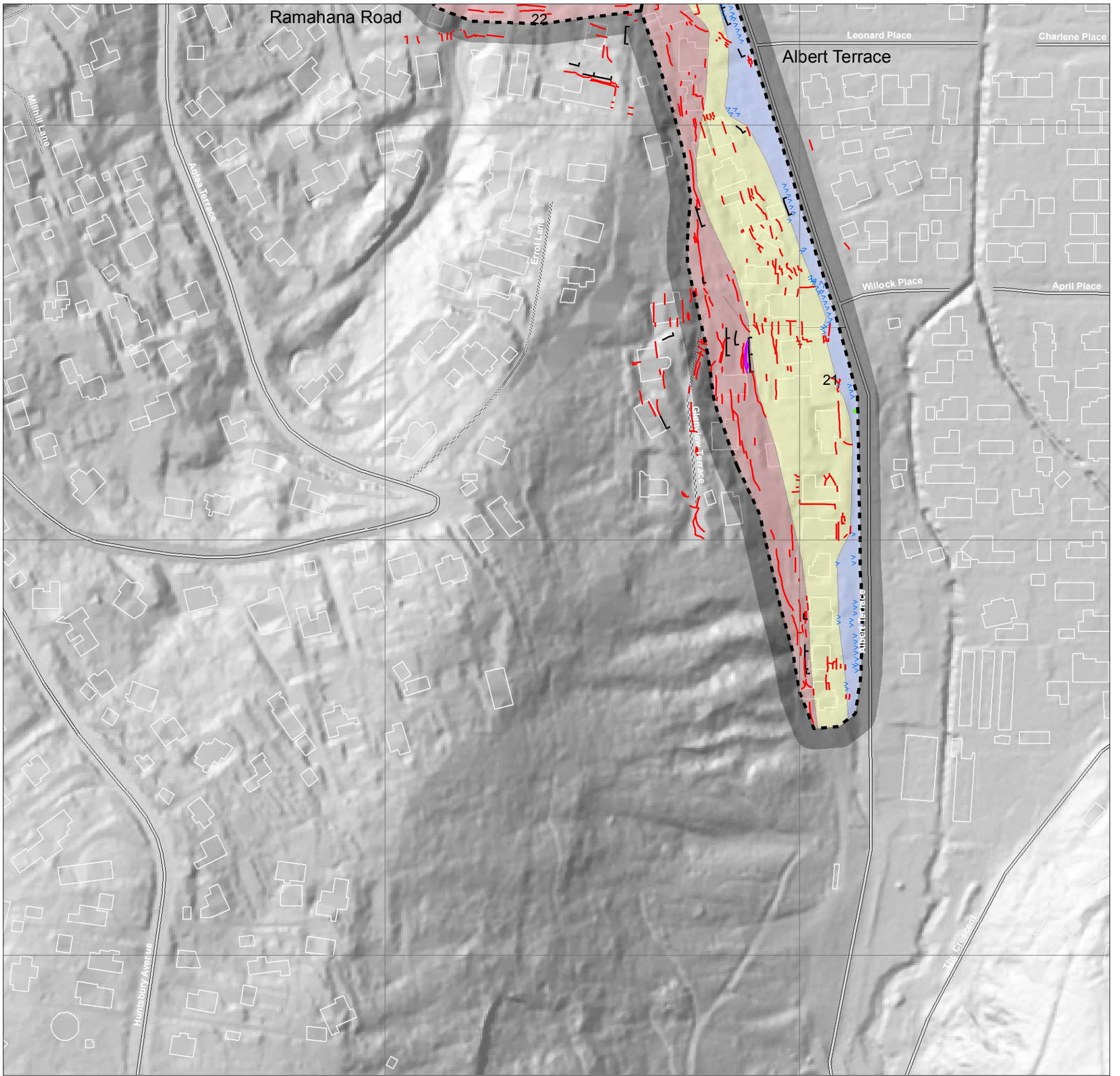
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map D5**

REPORT: CR2012/317 DATE: July 2013



5176200

5176000

5175800

1572200

1572400

**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

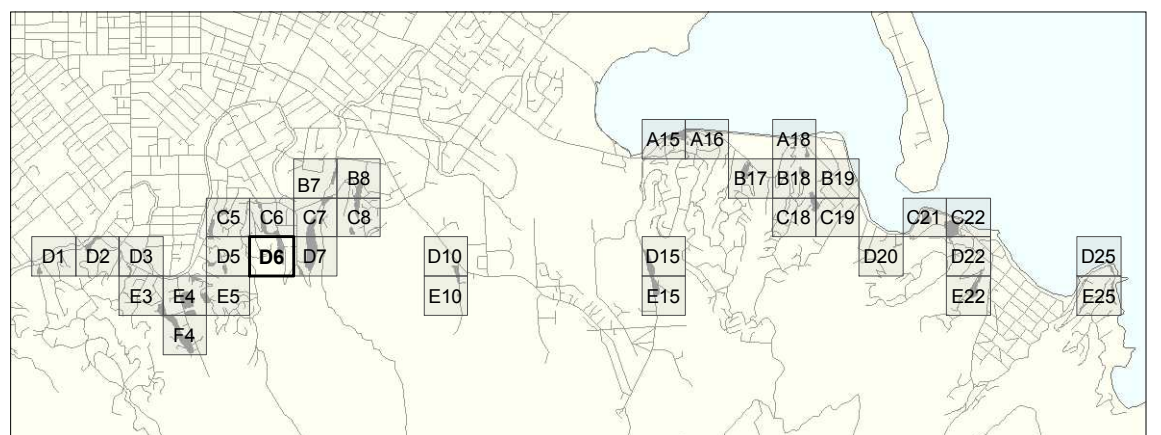
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

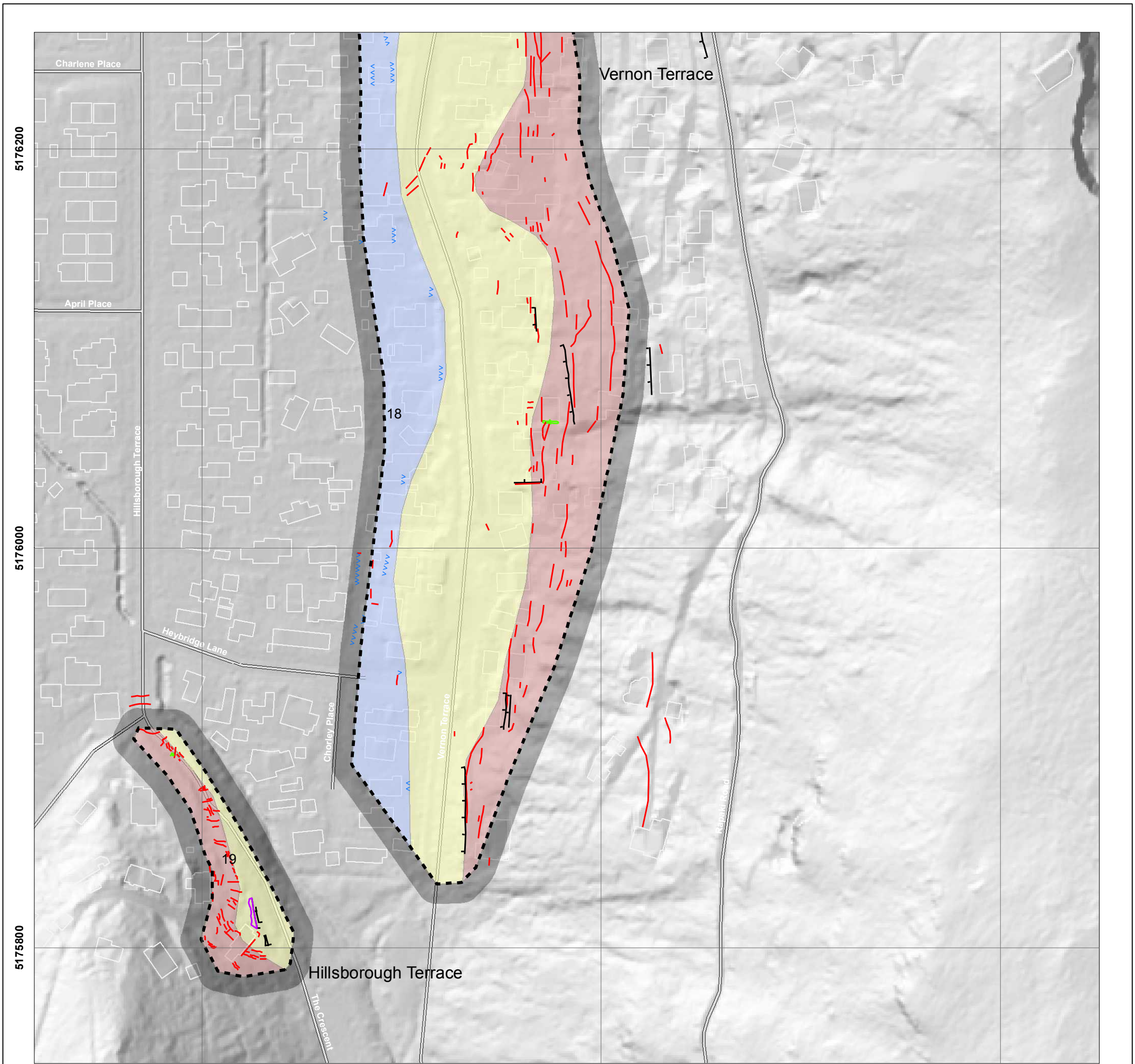
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map D6**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

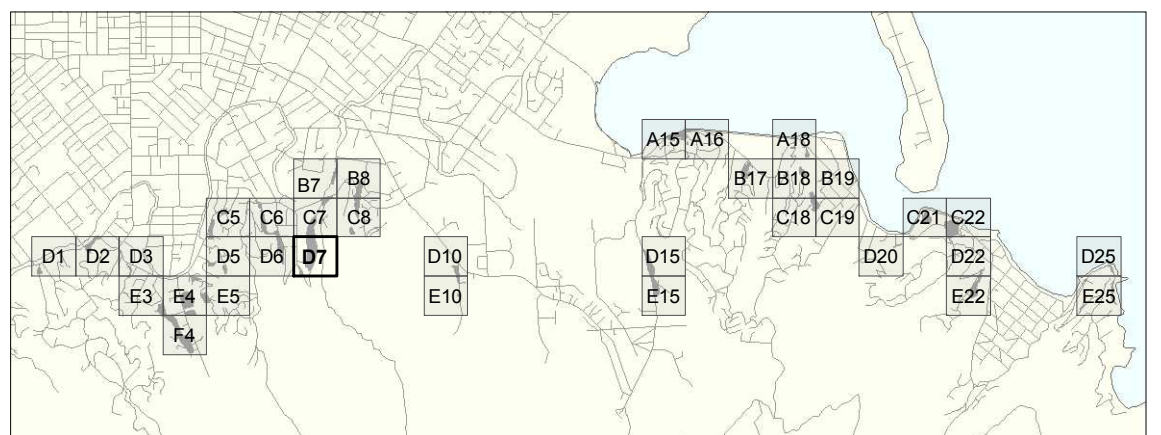
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

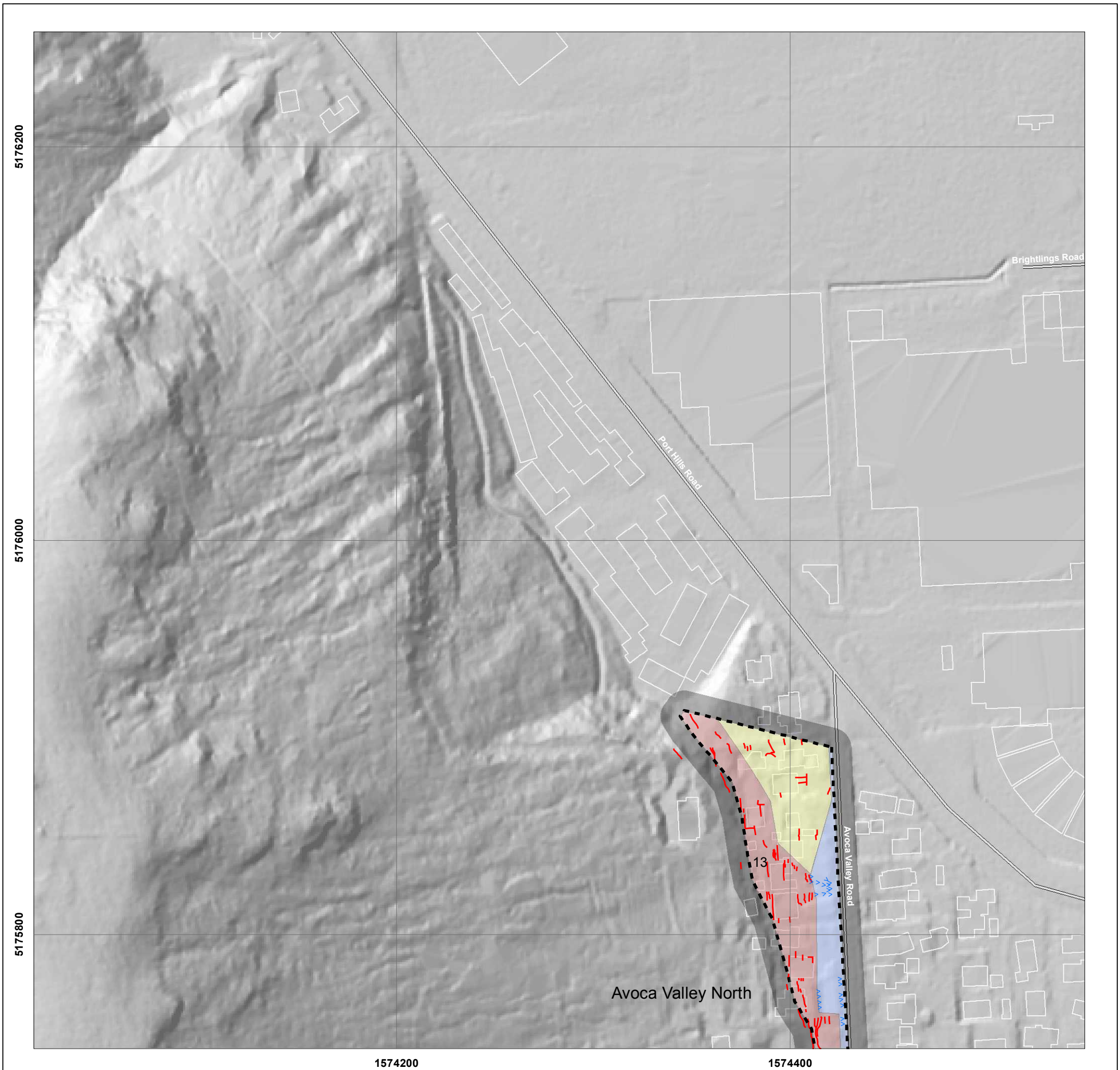
**Port Hills  
 Christchurch**

**Appendix 2**

**FINAL**

**Map D7**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

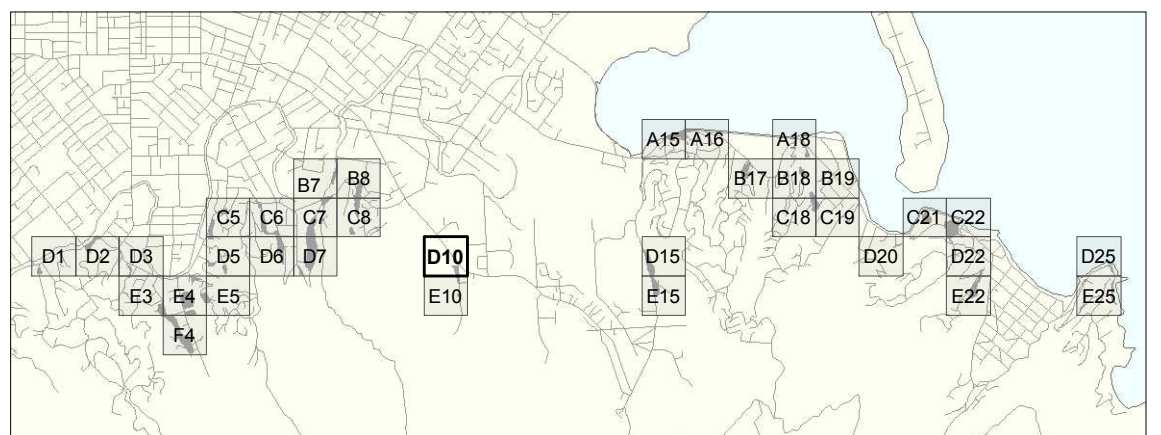
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

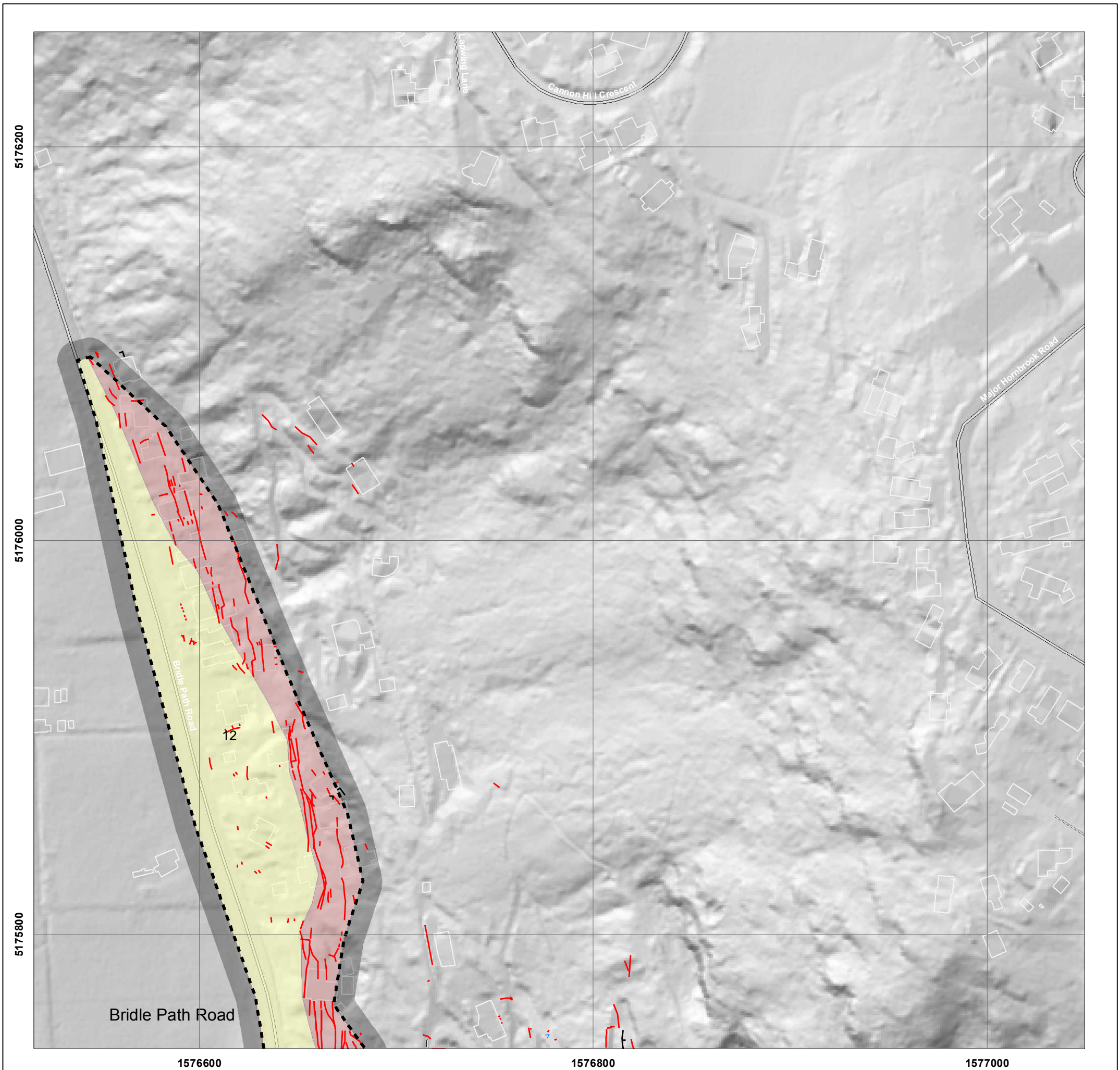
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map D10**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

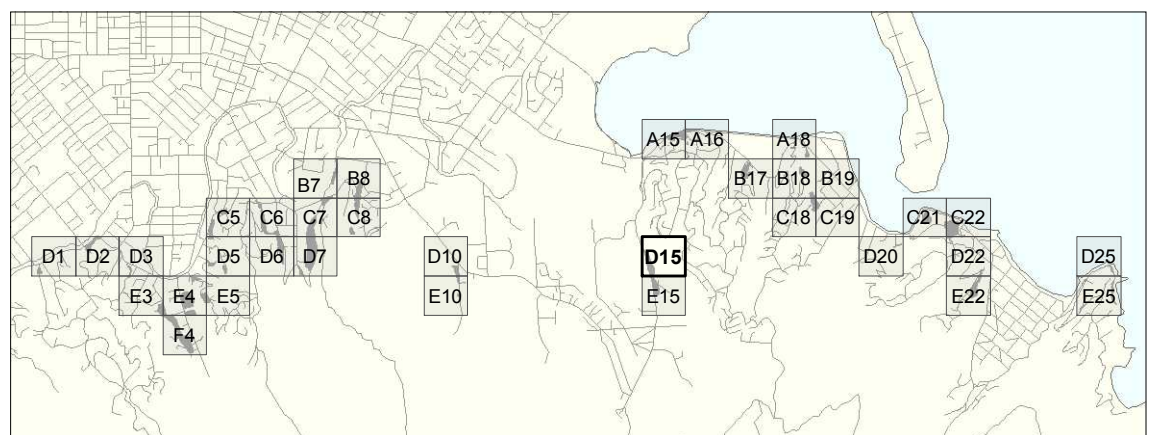
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills  
Christchurch**

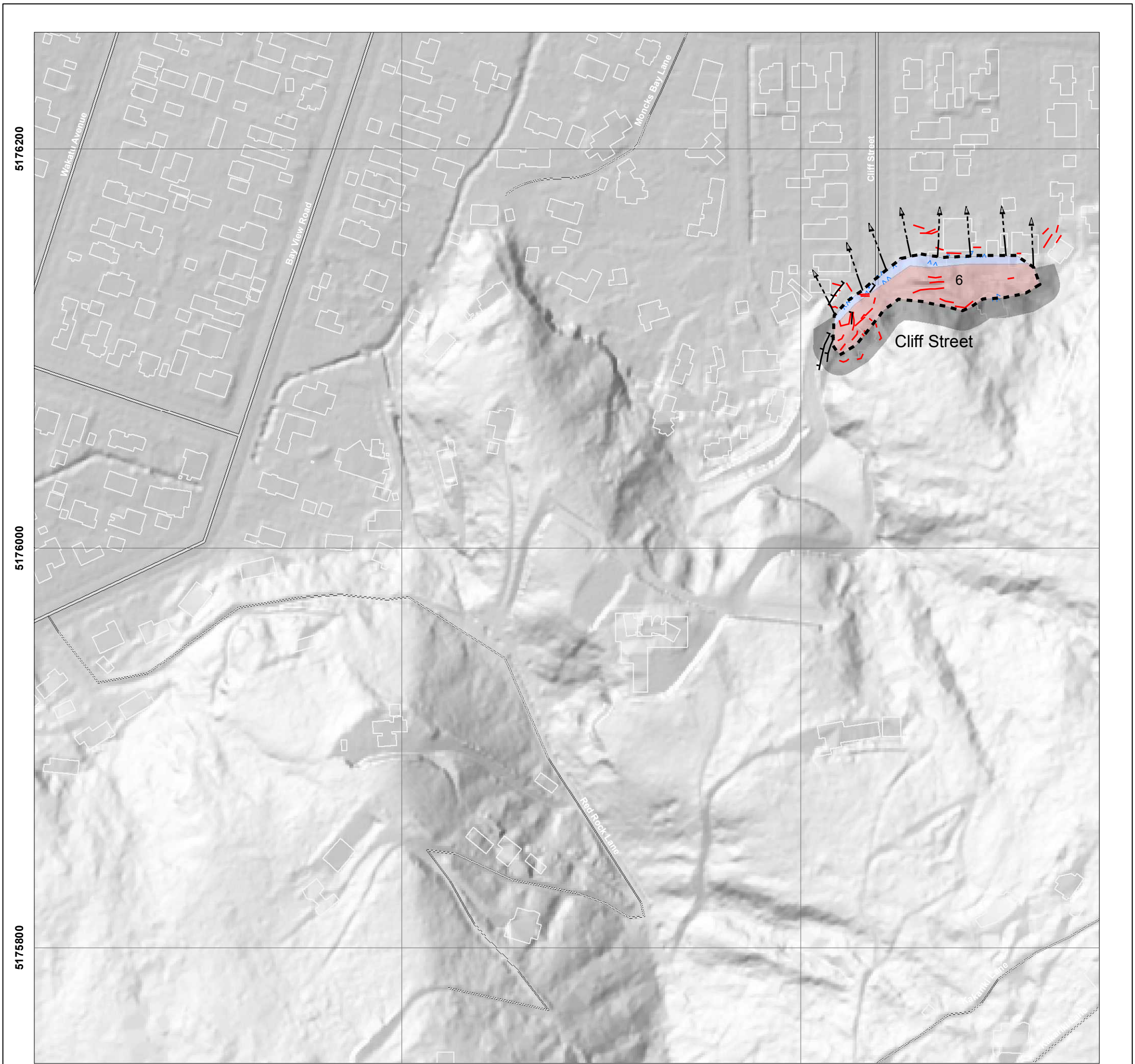
**Appendix 2**

**FINAL**

**Map D15**

REPORT: CR2012/317      DATE: July 2013





**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

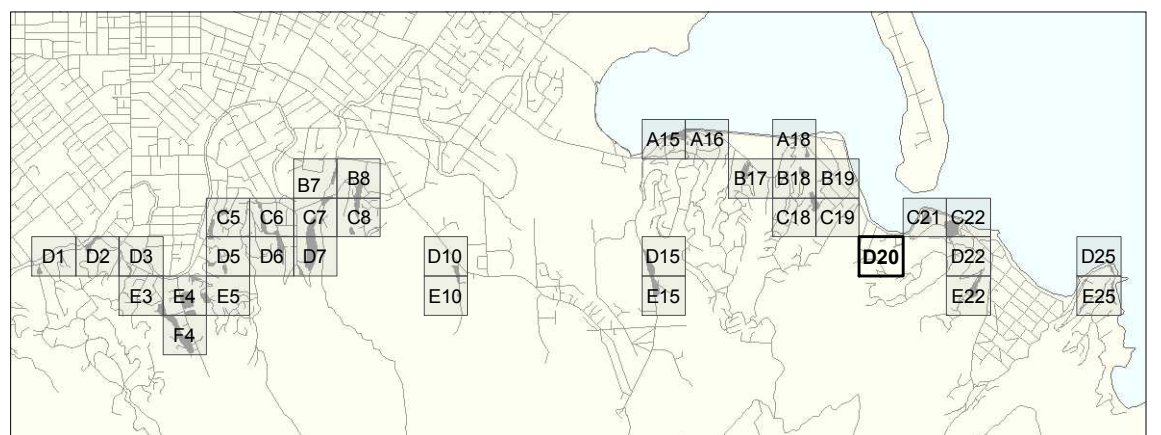
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

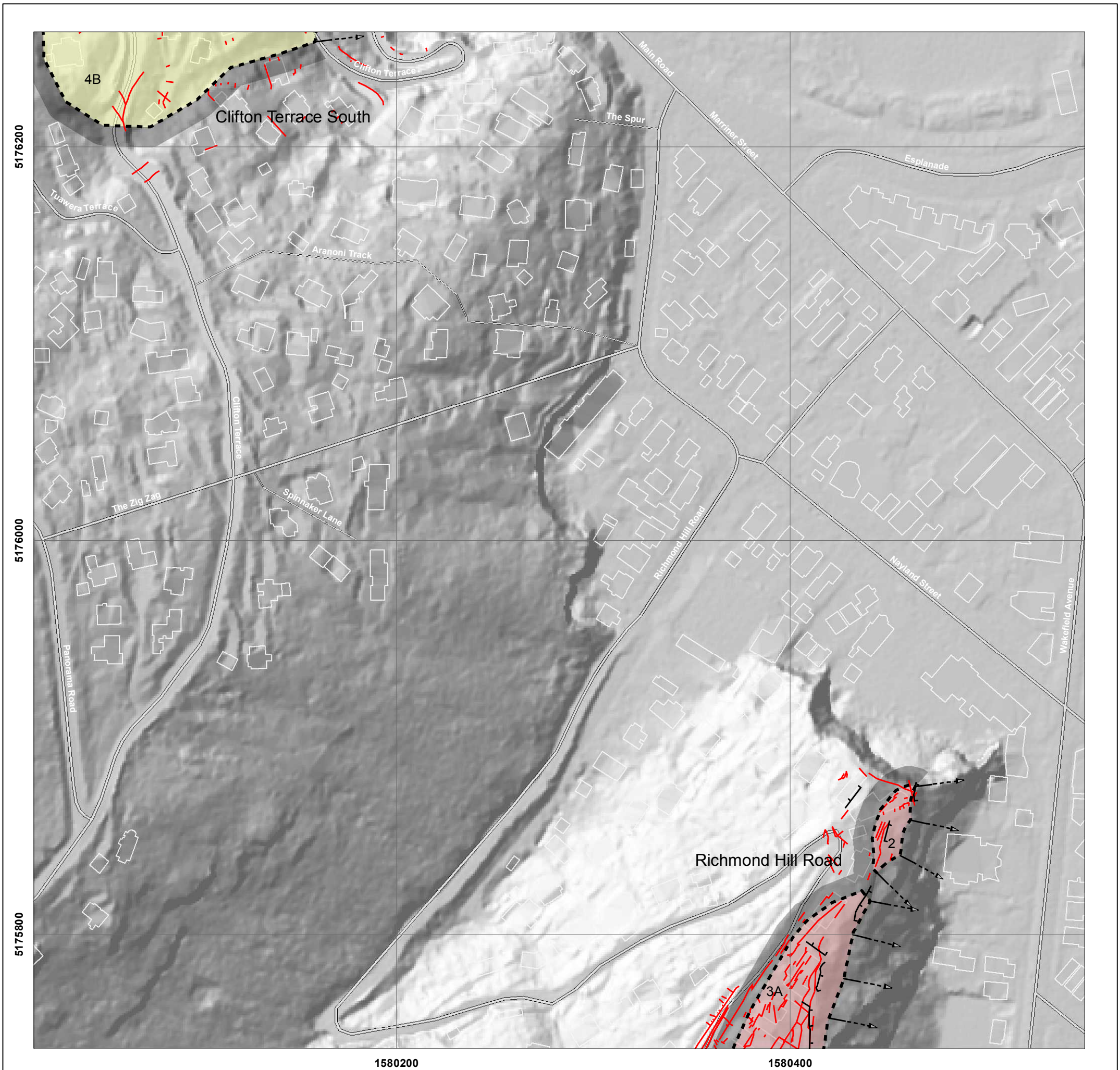
**Port Hills  
 Christchurch**

**Appendix 2**

**FINAL**

**Map D20**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

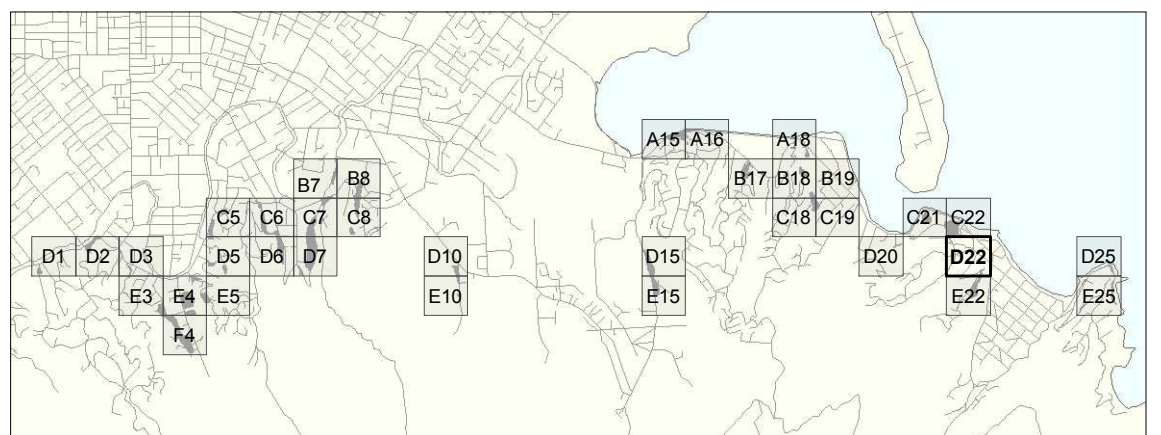
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills  
 Christchurch**

**Appendix 2**

**FINAL**

**Map D22**

REPORT: CR2012/317      DATE: July 2013

5176200

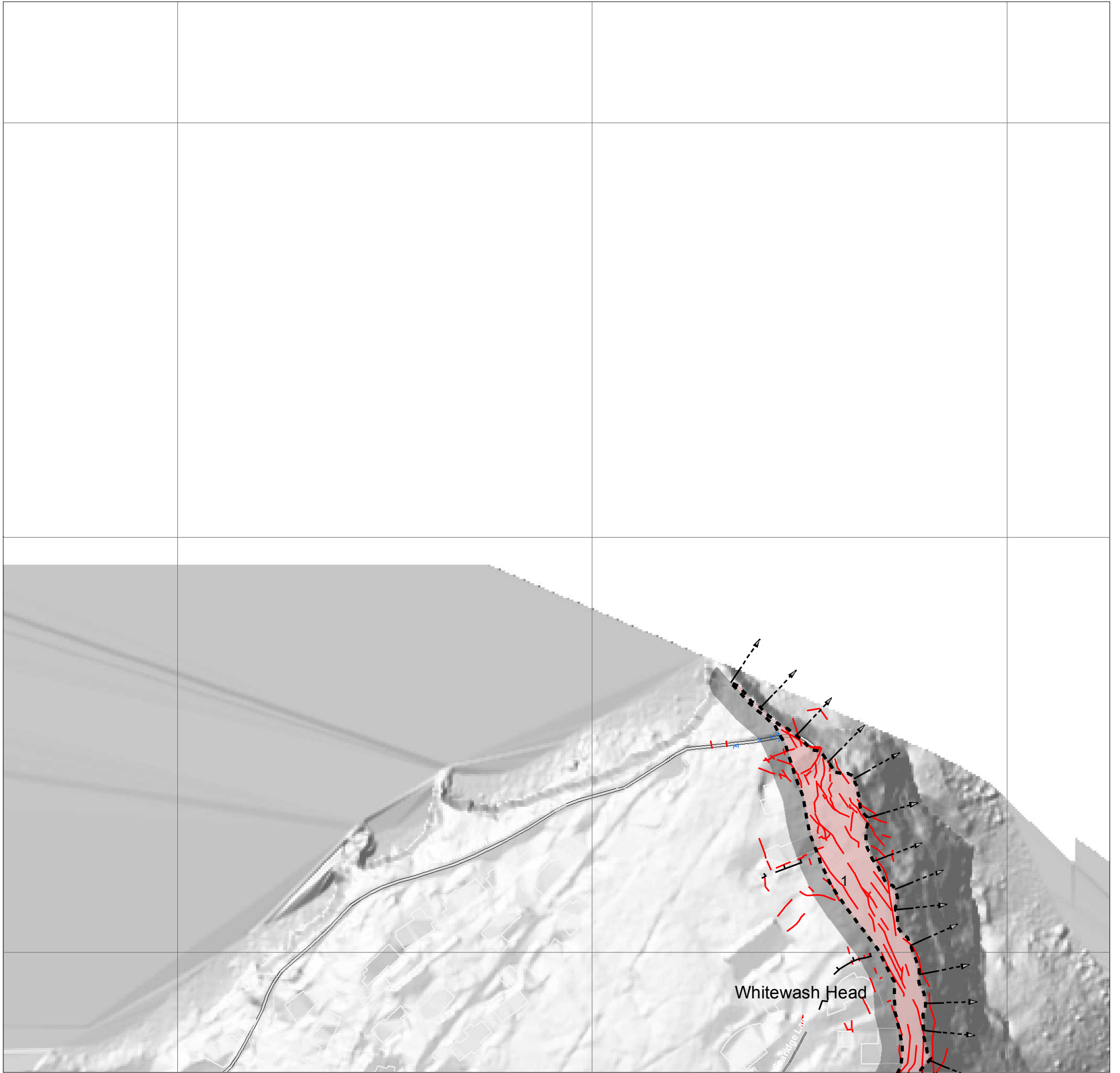
5176000

5175800

1581600

1581800

1582000



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

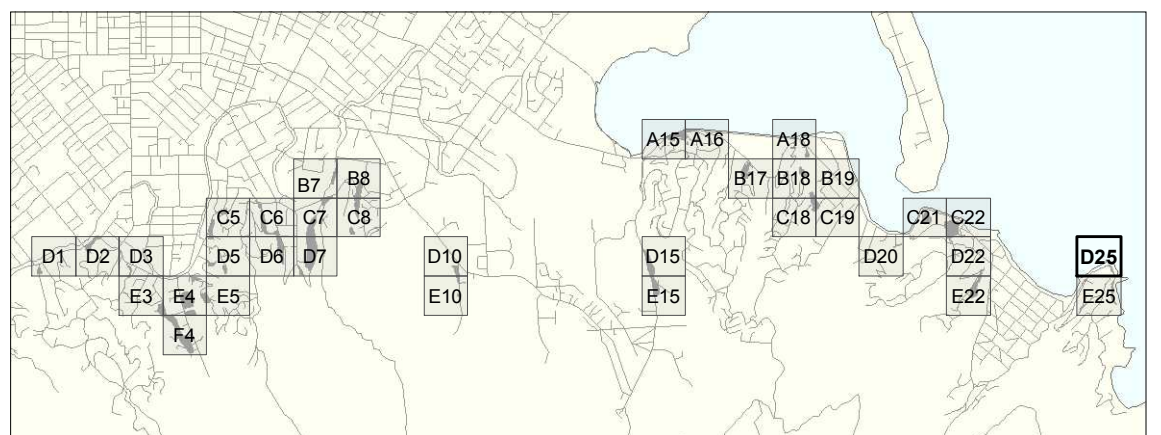
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

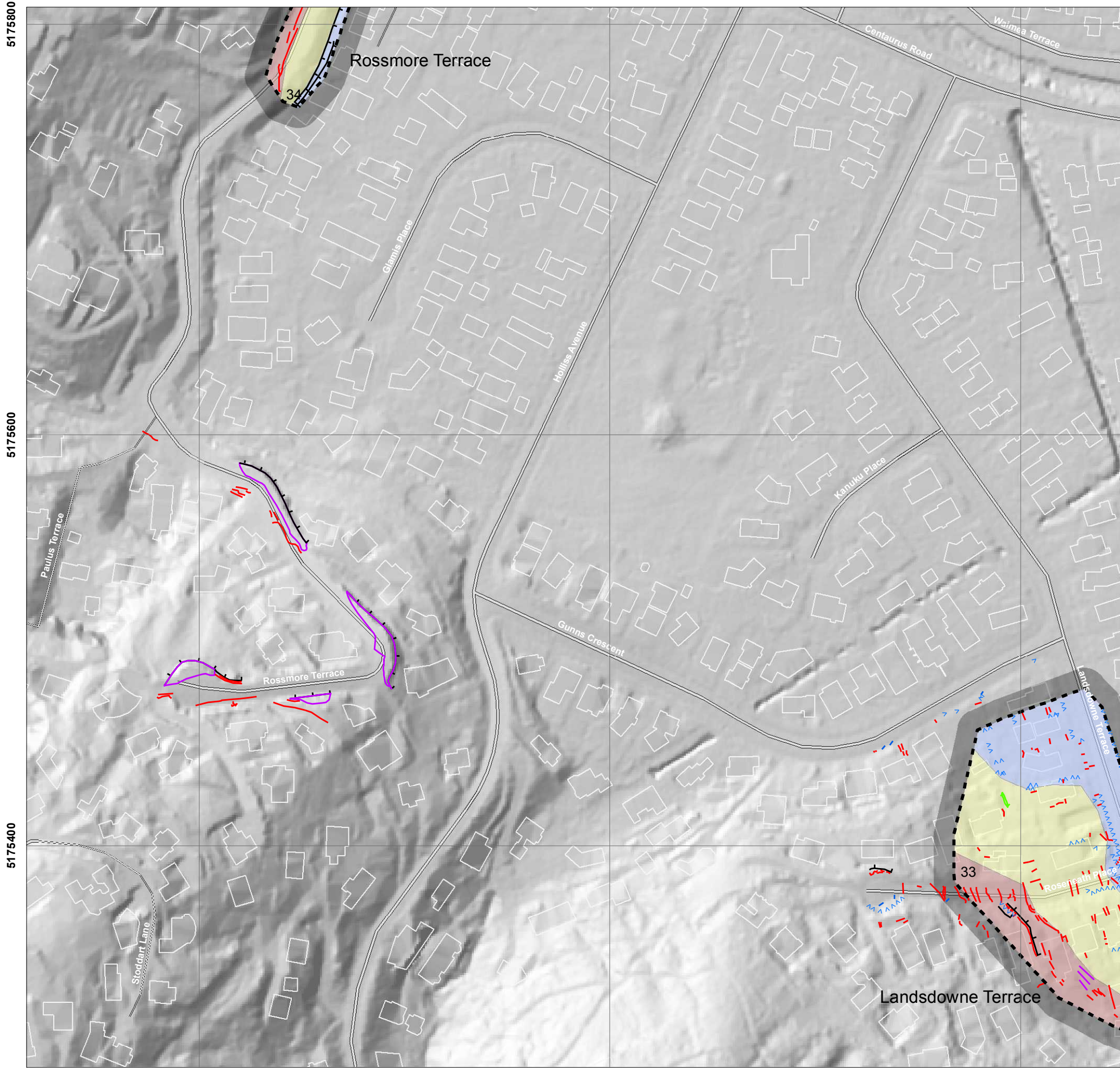
**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map D25**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- - - - Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

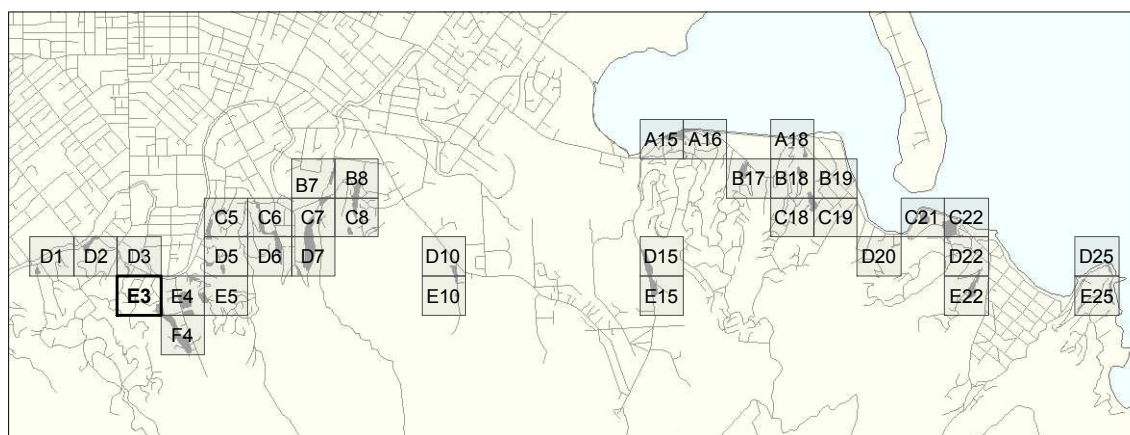
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



SCALE BAR: 0 50 100 m

**EXPLANATION:**

Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

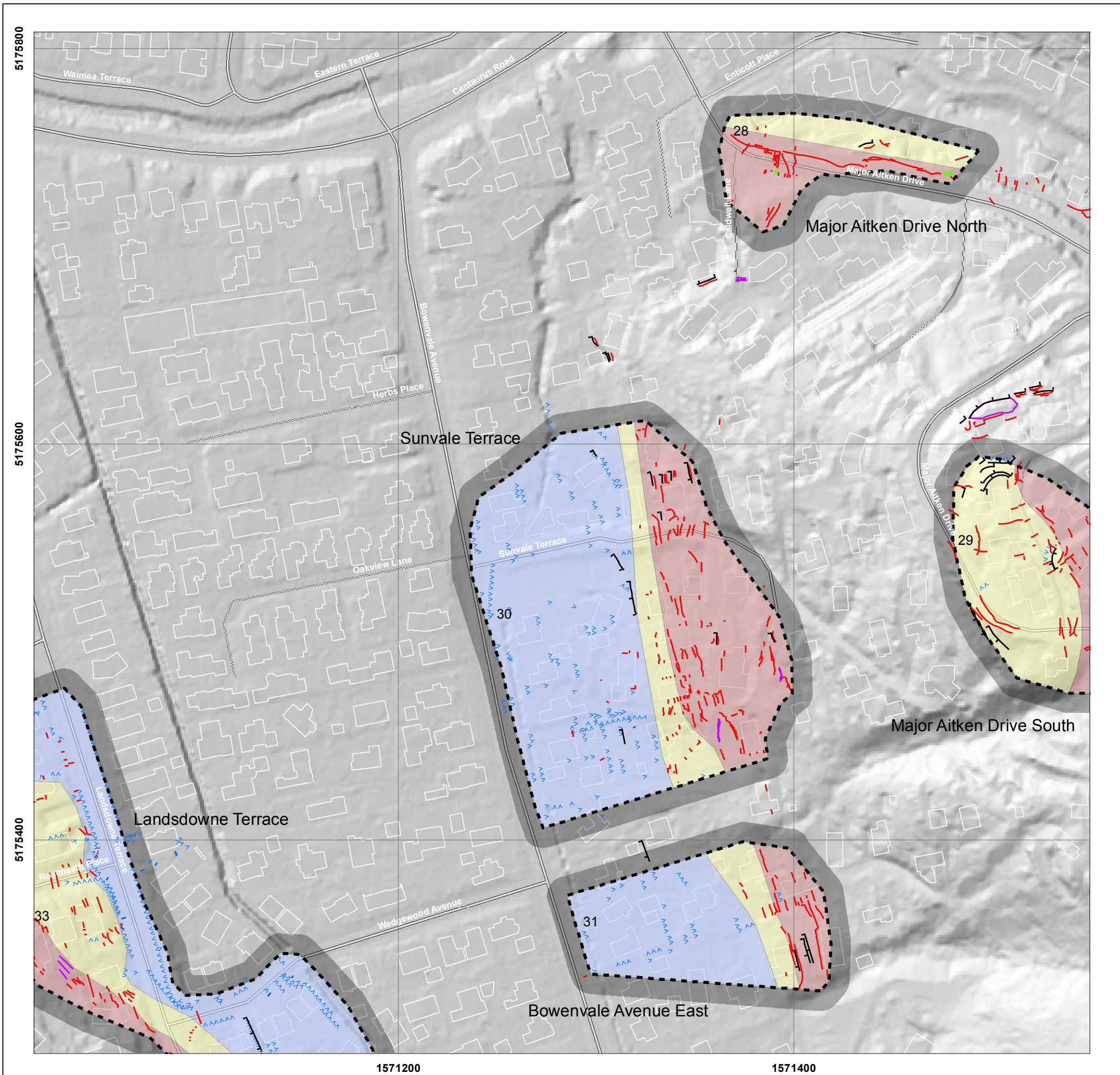
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map E3**

REPORT: CR2012/317 DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

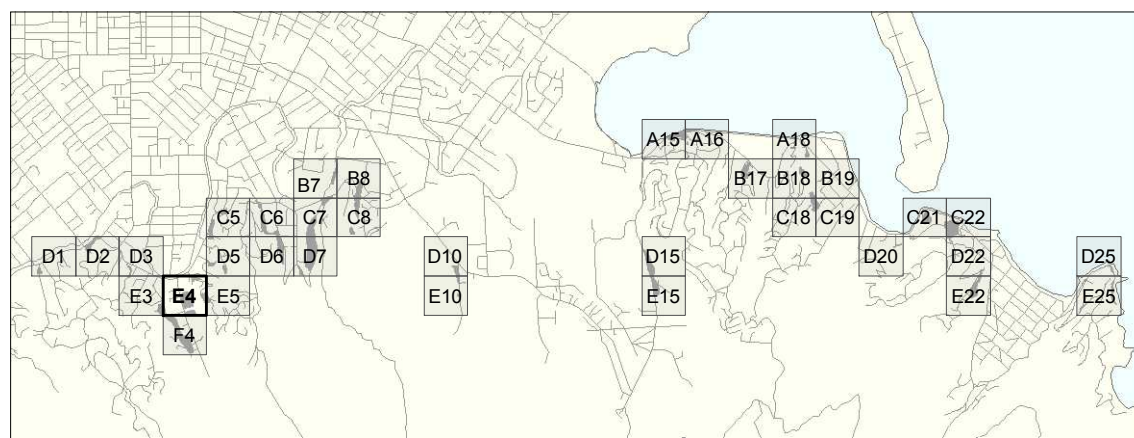
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

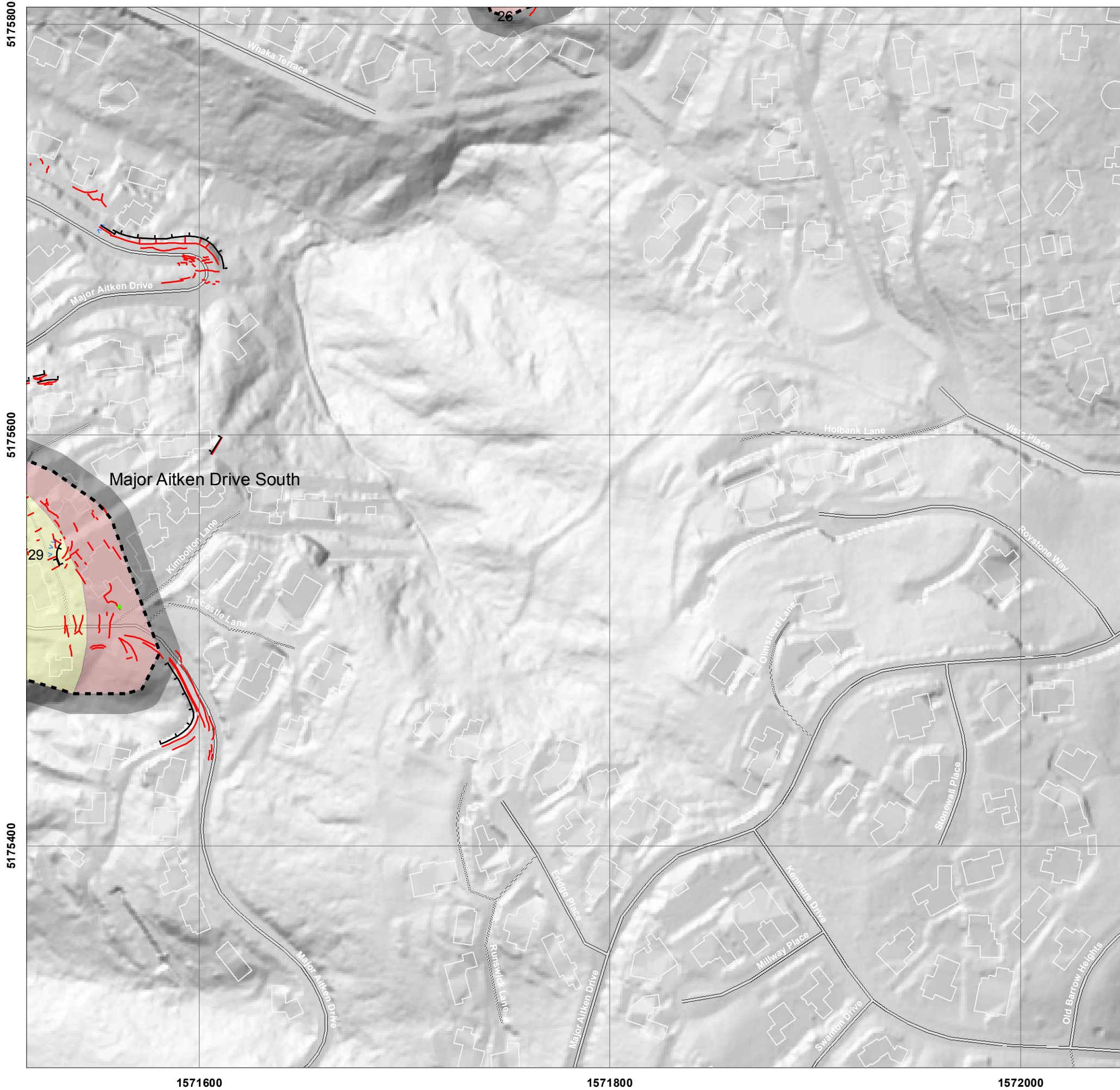
**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map E4**

REPORT: CR2012/317      DATE: July 2013



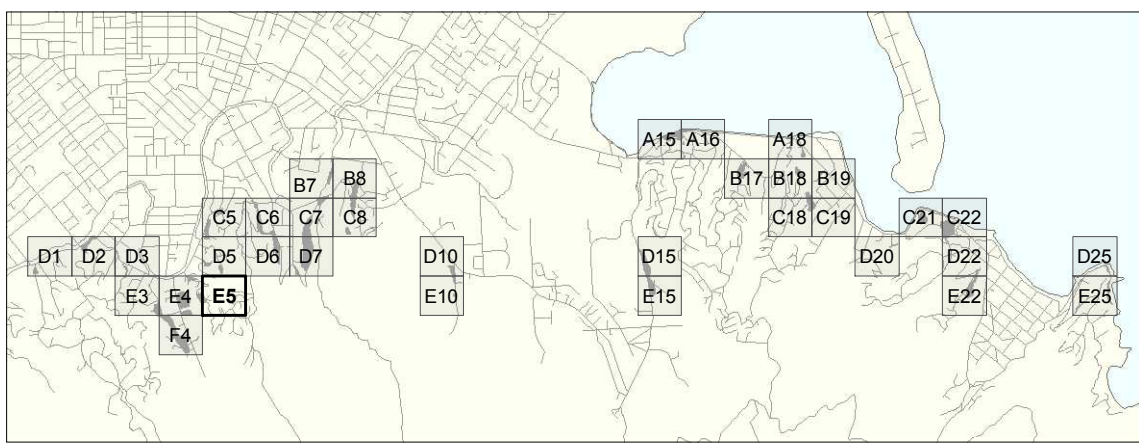
- Surface deformation\***
- Tension crack
  - Complex zone of cracking
  - Subsidence
  - ~~~~~ Compression zone
  - Tunnel gully
  - Tilted/deformed retaining wall/fence
  - Spring

- Current mass movements**
- Inferred mass movement boundary (June 2013)
  - Mainly extensional area
  - Mainly translational area
  - Mainly compressional area
- Potential future enlargement of mass movements**
- 10 m enlargement area
  - Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

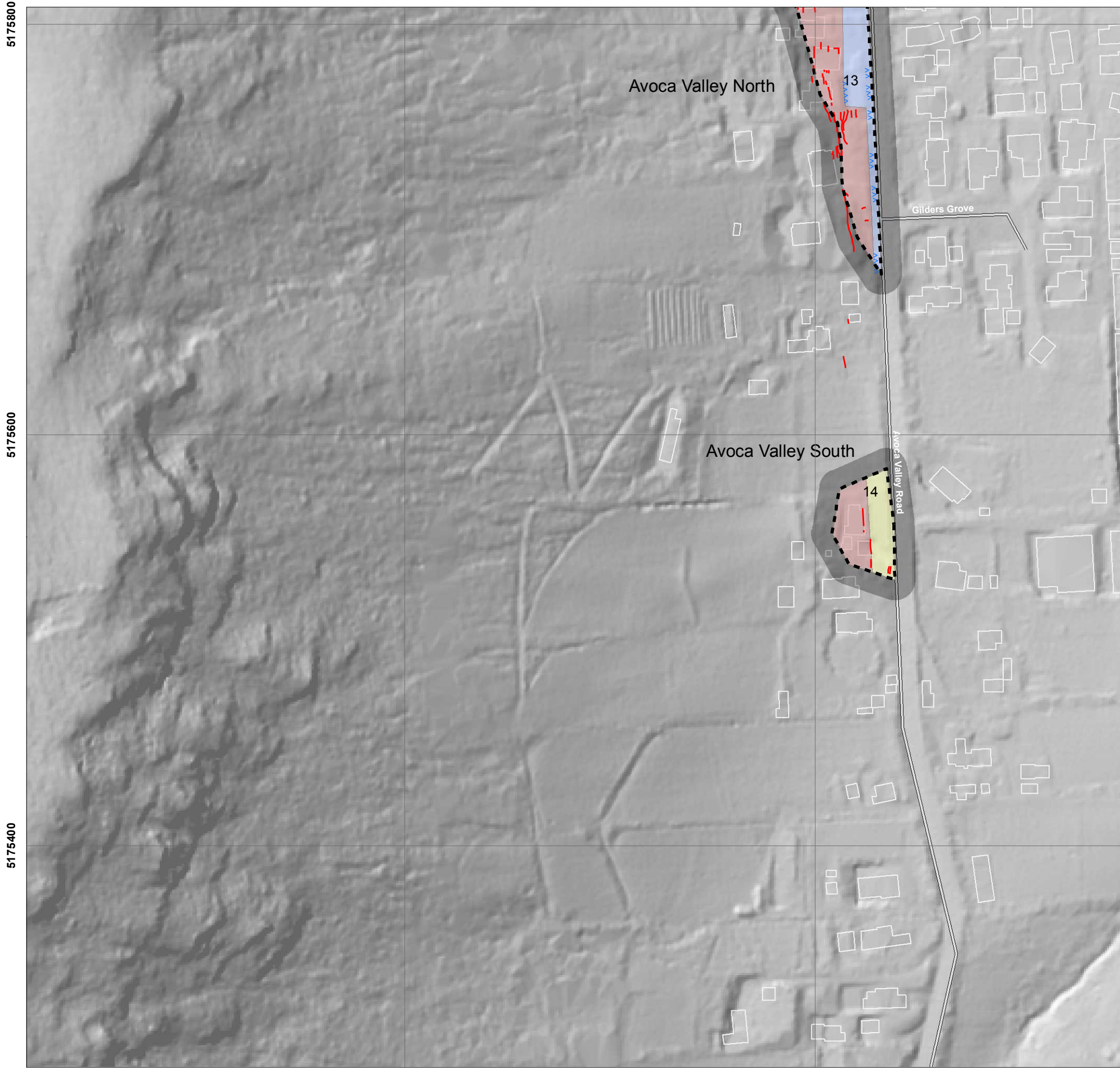
**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map E5**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

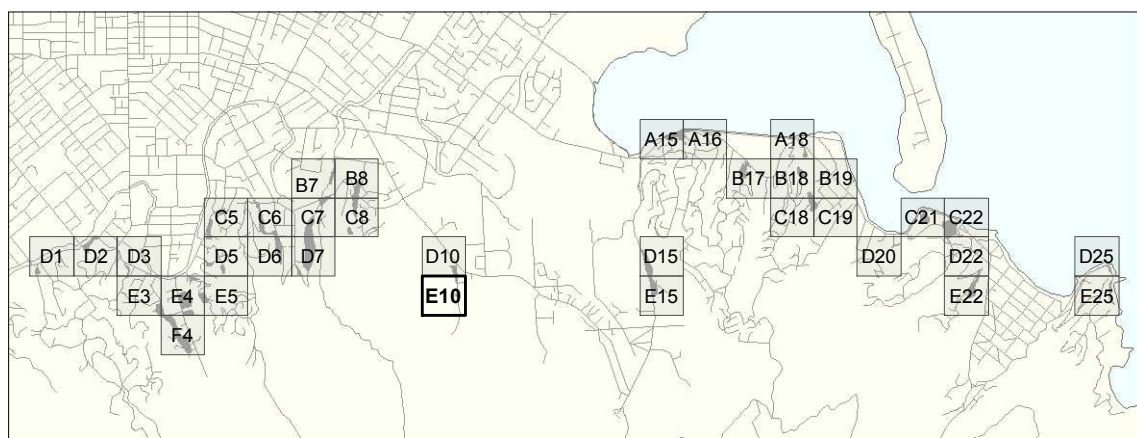
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

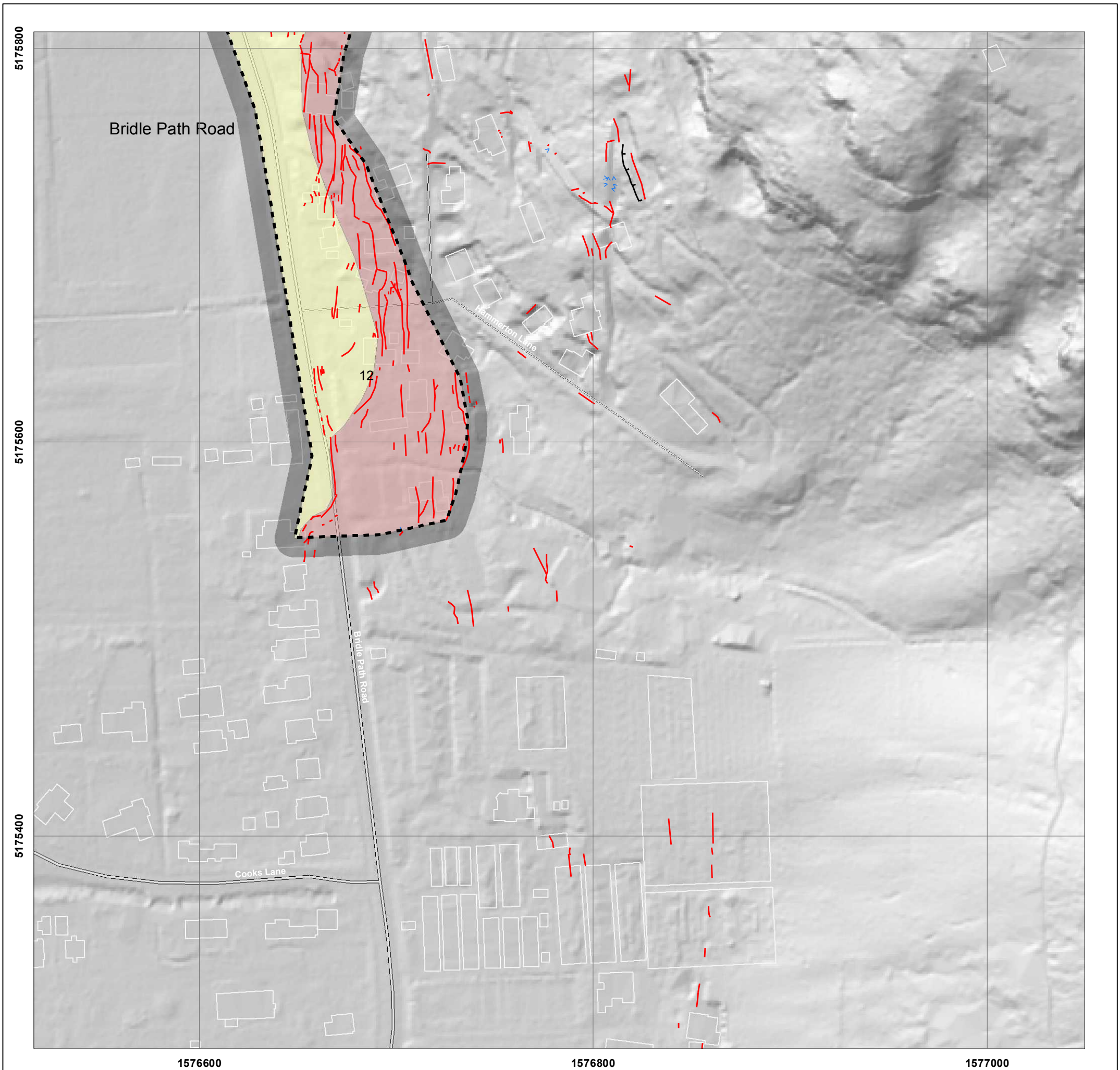
**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map E10**

REPORT: CR2012/317      DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

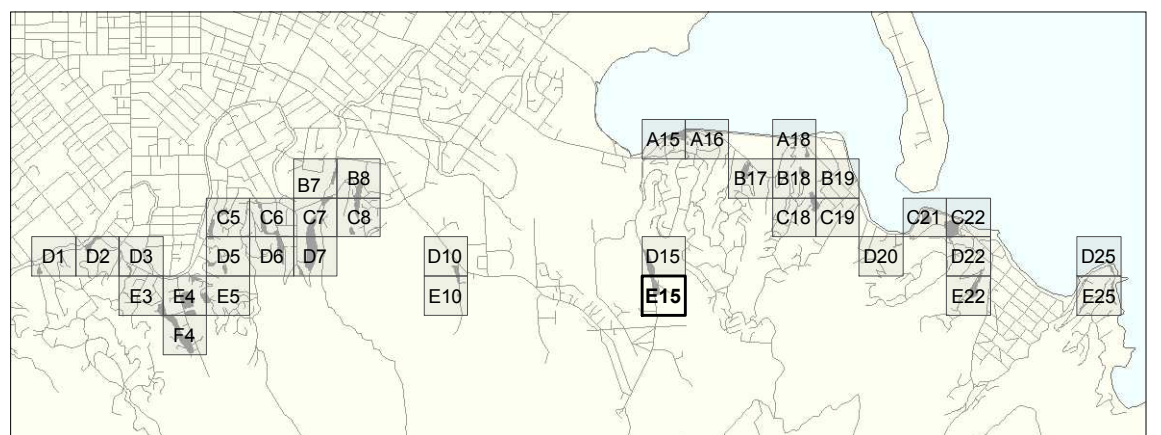
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills  
Christchurch**

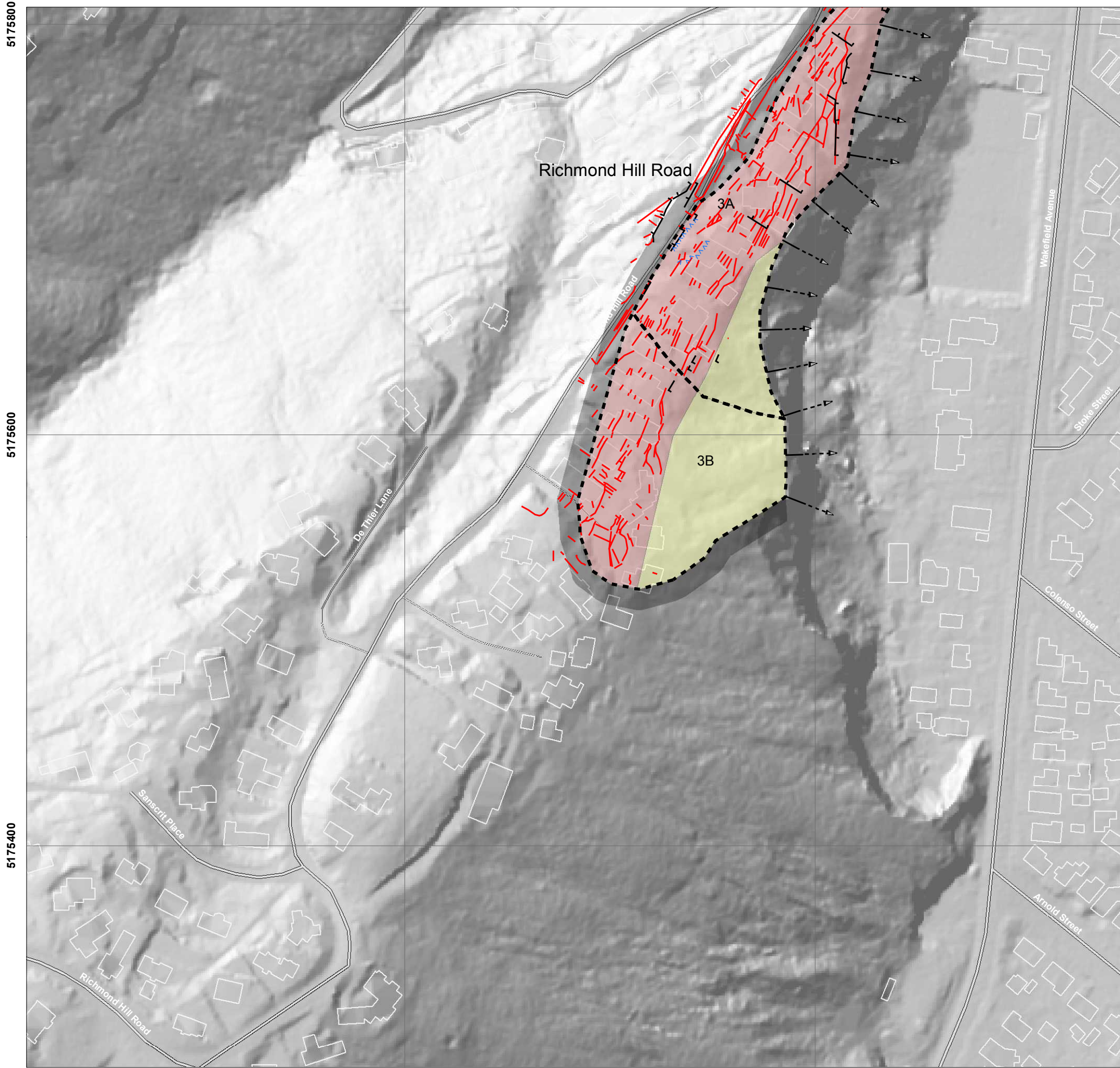
**Appendix 2**

**FINAL**

**Map E15**

REPORT: CR2012/317 DATE: July 2013





**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

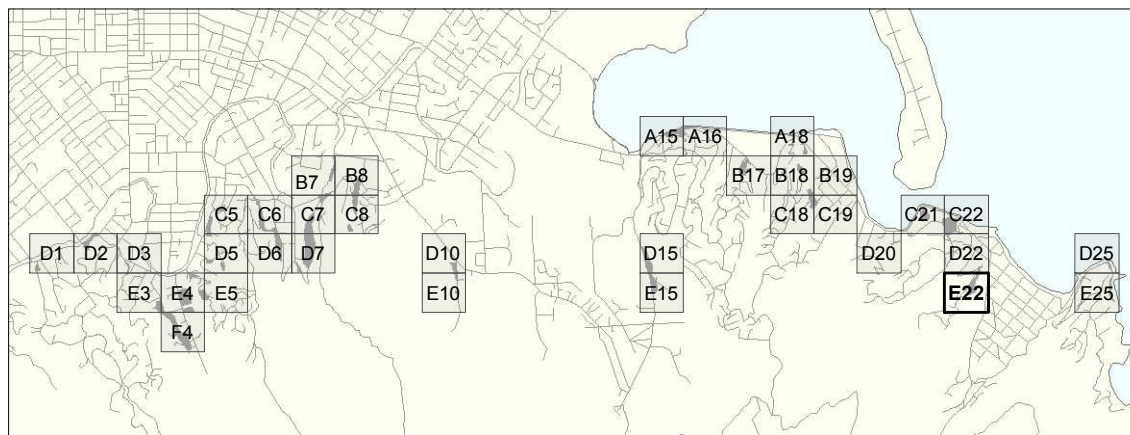
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



SCALE BAR: 0 50 100 m

**EXPLANATION:**

Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012). PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

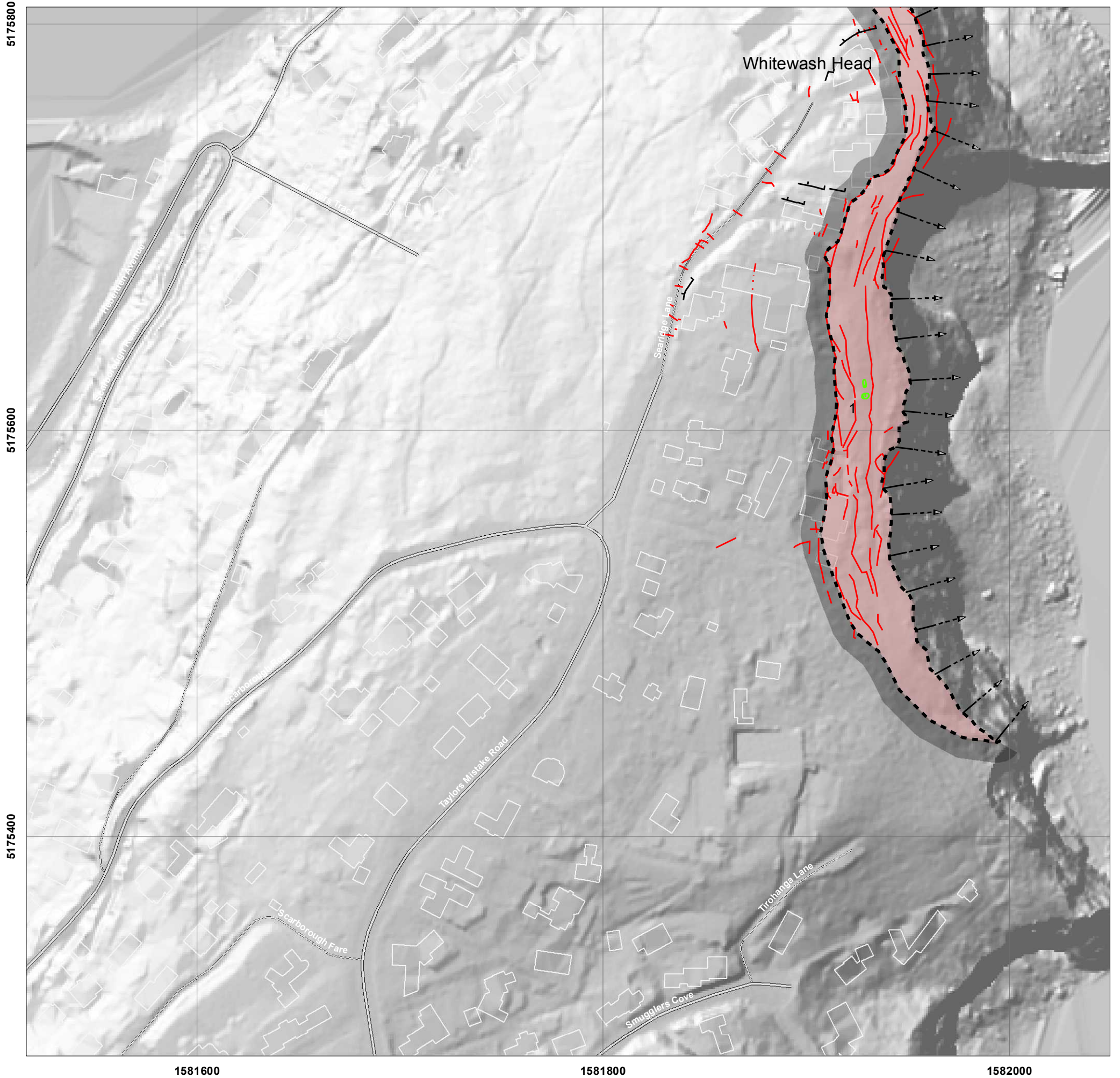
**Port Hills Christchurch**

**Appendix 2**

**FINAL**

**Map E22**

REPORT: CR2012/317 DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

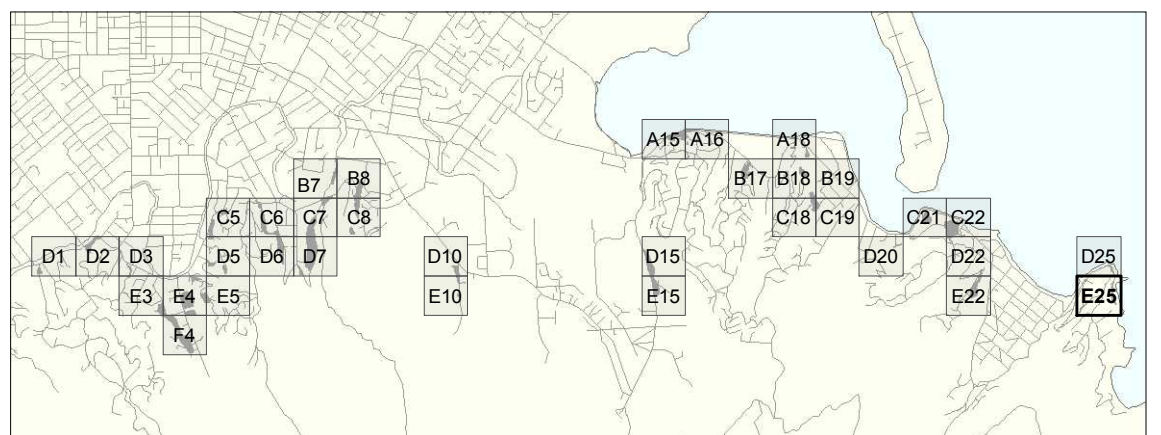
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



EXPLANATION:  
 Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
 PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
 CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

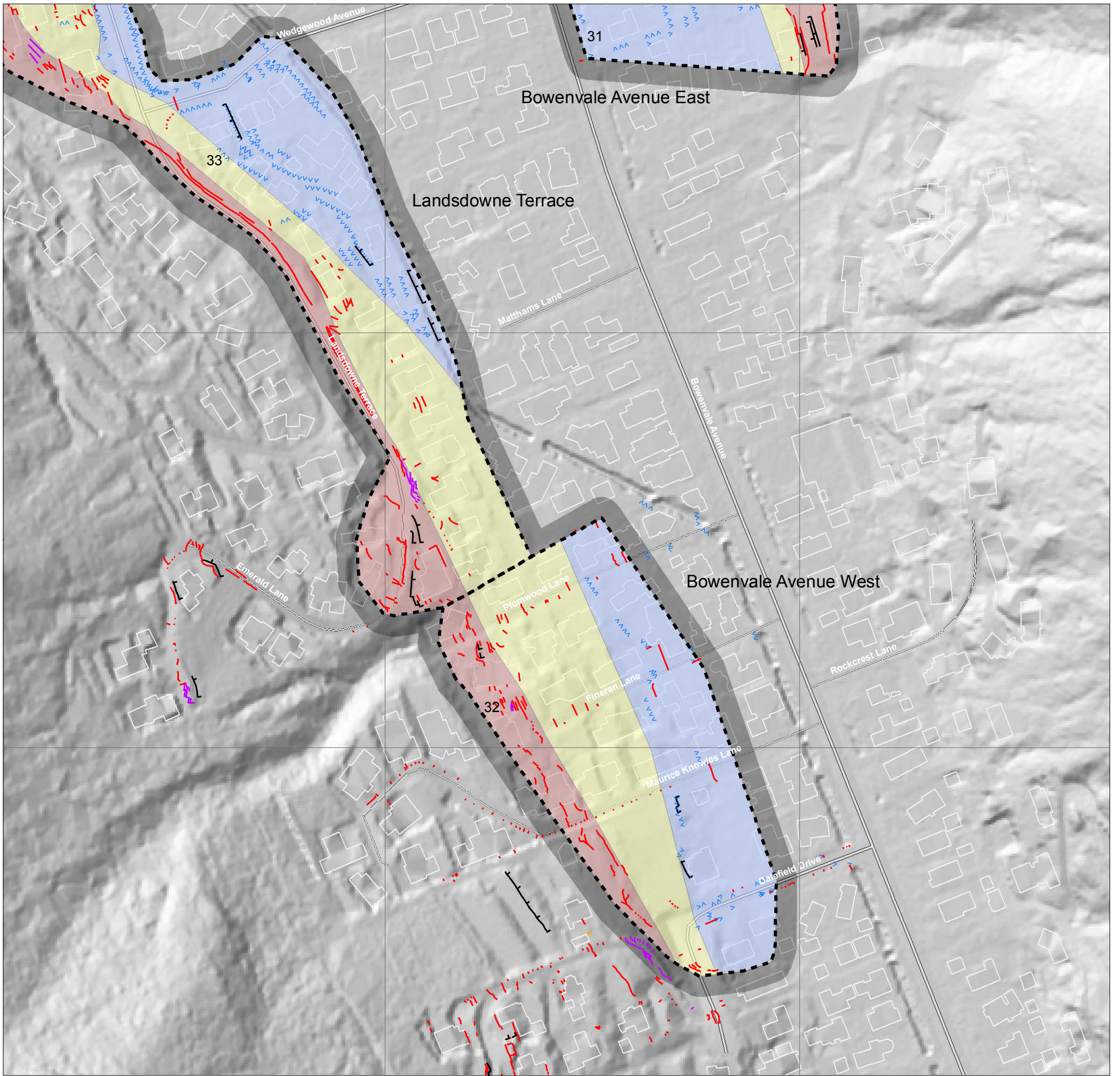
**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map E25**

REPORT: CR2012/317    DATE: July 2013



**Surface deformation\***

- Tension crack
- Complex zone of cracking
- Subsidence
- ~~~~~ Compression zone
- Tunnel gully
- Tilted/deformed retaining wall/fence
- Spring

**Current mass movements**

- Inferred mass movement boundary (June 2013)
- Mainly extensional area
- Mainly translational area
- Mainly compressional area

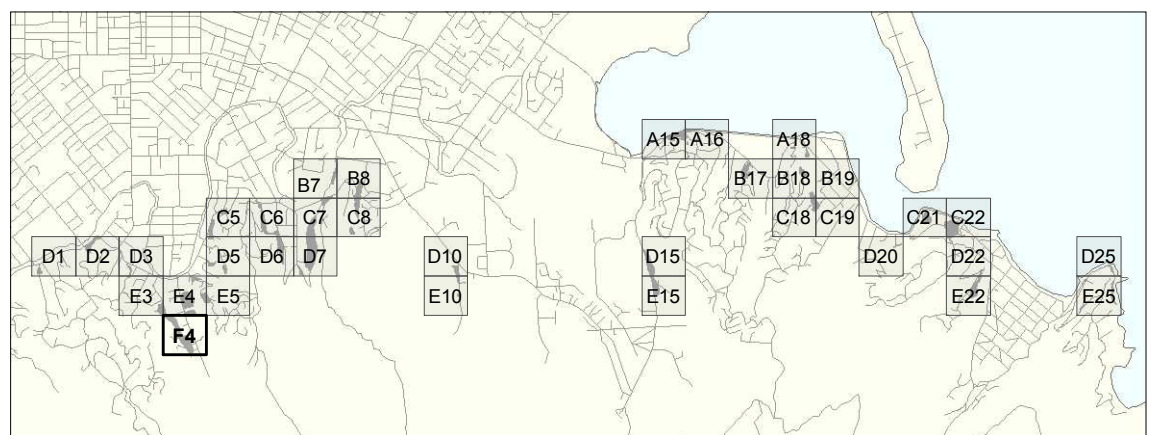
**Potential future enlargement of mass movements**

- 10 m enlargement area
- Estimated runout directions. Length of arrow does not indicate runout distance.

Refer to Appendix 1 for mass movement hazard exposure categories. Details (ID/location) are contained in Table A 3.1.



\* The information shown on this map is based on field mapping that is accurate to approximately +/- 5m. The mapping was of features apparent between October 2012 and January 2013. It should be noted that these features may change over time. For example new cracks and areas of subsidence may appear and some cracks may disappear.



SCALE BAR: 0 50 100 m

**EXPLANATION:**

Background shade model derived from NZAM post earthquake 2011c (July 2011) LiDAR survey resampled to a 1 m ground resolution. Roads and building footprints and types provided by Christchurch City Council (20/02/2012).  
PROJECTION: New Zealand Transverse Mercator 2000

DRW: BL  
CHK: CM, JC, MY



**STAGE 1: MASS MOVEMENTS**

**Port Hills  
Christchurch**

**Appendix 2**

**FINAL**

**Map F4**

REPORT: CR2012/317 DATE: July 2013