



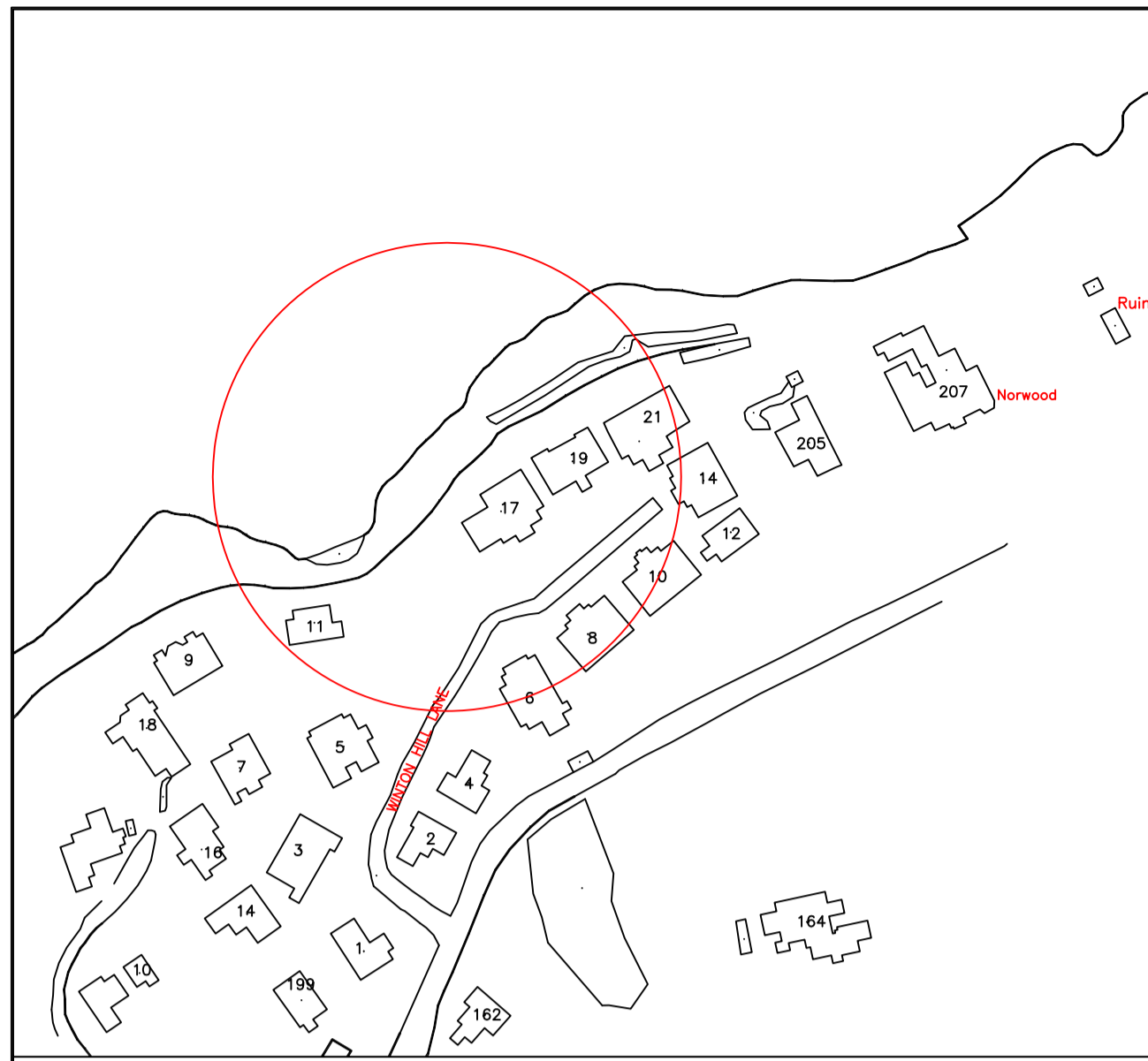
Winton Hill Railway Trail Rock Cut Stabilization

Bermuda

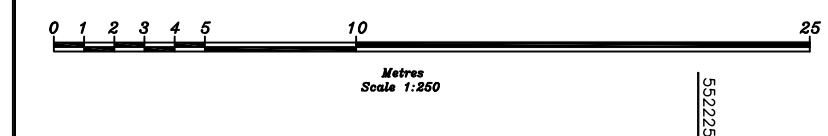
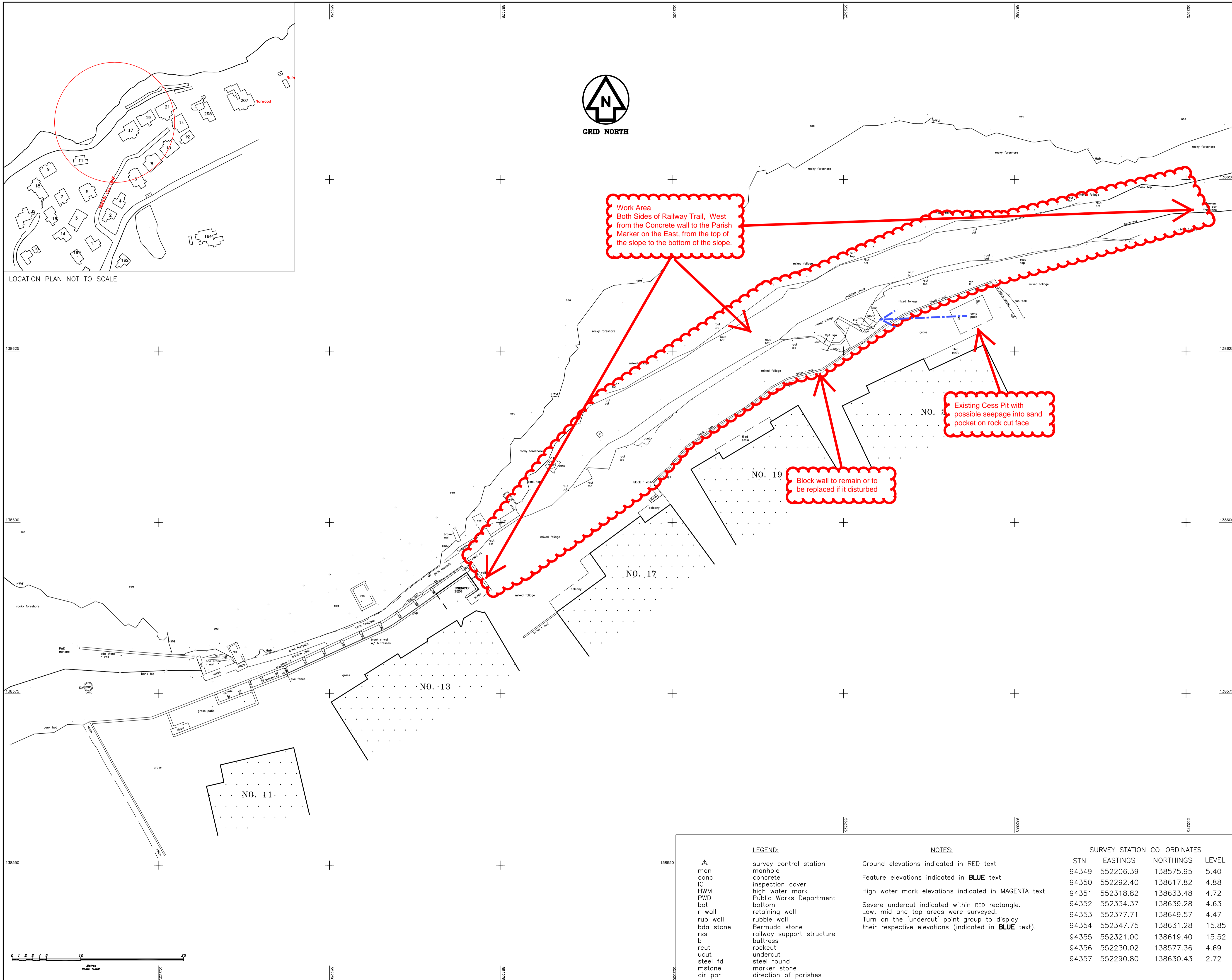
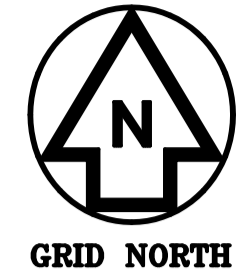
Annex D Drawings and Reference Documents

Date: September 13, 2017

Project No. 90-05-76



LOCATION PLAN NOT TO SCALE



GENERAL NOTES:
 1. SURVEY GRID IS BNG2000.
 2. LEVELS ARE IN METRES ABOVE ORDNANCE DATUM.

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ISSUED FOR:

AMENDMENTS:

NO:	REVISION	APP	DATE:

SCALE: 1:250 METRIC

SURVEY
 PREPARED BY: C. SHANE MCILWAIN/C. TURNER DATE: 28/06/12

DESIGN
 PREPARED BY: DATE:

CHECKED BY: DATE:

DRAWING
 PREPARED BY: C. SHANE MCILWAIN DATE: 06/07/12
 CHECKED BY: SEAN PATTERSON DATE: 10/07/12

APPROVED BY:
 Sean Patterson - Senior Land Surveyor

PROJECT NUMBER:
 30/242/12 TN59365

PROJECT NAME:
**RAILWAY TRAIL
 FORESHORE
 REMEDIATION
 NOS. 11, 13, 17, 19 & 21
 WINTON HILL LANE
 HAMILTON**

DRAWING FILE NO: CIVIL3D 2010
 PIMS\SURVEYPROJECTS\3024212\523800602

SHEET TITLE:
**TOPO OF WINTON HILL
 WATERFRONT**

SHEET NUMBER:
5238/006/02

LEGEND:		NOTES:	SURVEY STATION CO-ORDINATES			
△	survey control station	Ground elevations indicated in RED text	STN	EASTINGS	NORTHINGS	LEVEL
man	manhole	Feature elevations indicated in BLUE text	94349	552206.39	138575.95	5.40
con	concrete	High water mark elevations indicated in MAGENTA text	94350	552292.40	138617.82	4.88
IC	inspection cover	Severe undercut indicated within RED rectangle. Low, mid and top areas were surveyed. Turn on the 'undercut' point group to display their respective elevations (indicated in BLUE text).	94351	552318.82	138633.48	4.72
HWM	high water mark		94352	552334.37	138639.28	4.63
PWD	Public Works Department		94353	552377.71	138649.57	4.47
bot	bottom		94354	552347.75	138631.28	15.85
r wall	retaining wall		94355	552321.00	138619.40	15.52
rub wall	rubble wall		94356	552230.02	138577.36	4.69
bda stone	Bermuda stone		94357	552290.80	138630.43	2.72
rss	railway support structure					
b	buttress					
rcut	rockcut					
ucut	undercut					
steel fd	steel found					
mstone	marker stone					
dir	direction of parishes					



FIGURE 1
GOOGLE EARTH AERIAL PHOTO - WINTON HILL AREA

SITE PHOTO LOOKING WEST
ILLUSTRATING AREA OF CONCERN
ROCK AND DEBRIS AT TOE OF SLOPE BEHIND CHAIN-LINK
FENCE FROM HISTORICAL FAILURES



PHOTO DATE: APRIL 10, 2017

FIGURE 2
SITE PHOTO - WINTON HILL SITE - LOOKING WEST

PANORAMIC PHOTO OF SITE LOOKING SOUTH
ILLUSTRATING KARSTIC CAVE FEATURES



FIGURE 3
SITE PHOTO - LOOKING SOUTH

ORIGINAL PHOTO
(LOOKING WEST)



PHOTO DATE: APRIL 10, 2017

PHOTO HIGHLIGHTING
POTENTIALLY UNSTABLE ROCK



FIGURE 4
SITE PHOTO - LOOKING WEST

ORIGINAL PHOTO
(LOOKING EAST)



PHOTO DATE: APRIL 10, 2017

PHOTO HIGHLIGHTING
POTENTIALLY UNSTABLE ROCK



FIGURE 5
SITE PHOTO - LOOKING EAST

SITE PHOTO LOOKING EAST
ILLUSTRATING AREA OF CONCERN
ROCK AND DEBRIS AT TOE FROM HISTORICAL FAILURES



PHOTO DATE: APRIL 27, 2017

FIGURE 6
SITE PHOTO - LOOKING EAST

PANORAMIC PHOTO OF WESTERN SECTION OF SITE
LOOKING SOUTH
ILLUSTRATING KARSTIC CAVE FEATURES

KARST CAVE EXTENDING
HORIZONTALLY INTO SLOPE



PHOTO DATE: APRIL 27, 2017

FIGURE 7
SITE PHOTO - LOOKING SOUTH

ORIGINAL PHOTO
(LOOKING WEST)



PHOTO DATE: APRIL 27, 2017

PHOTO HIGHLIGHTING
POTENTIALLY UNSTABLE ROCK



FIGURE 8
SITE PHOTO - LOOKING WEST

ORIGINAL PHOTO
(LOOKING WEST)



PHOTO DATE: APRIL 27, 2017

PHOTO HIGHLIGHTING
POTENTIALLY UNSTABLE ROCK



FIGURE 9
SITE PHOTO - LOOKING WEST



GOVERNMENT OF BERMUDA
Ministry of Environment, Planning
& Infrastructure Strategy

Department of Land Surveys & Registration

P.O. Box HM1364 Hamilton HMF Bermuda
Phone: (441) 295-5151 Fax: (441) 295-5658

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Sean Patterson - Senior Land Surveyor

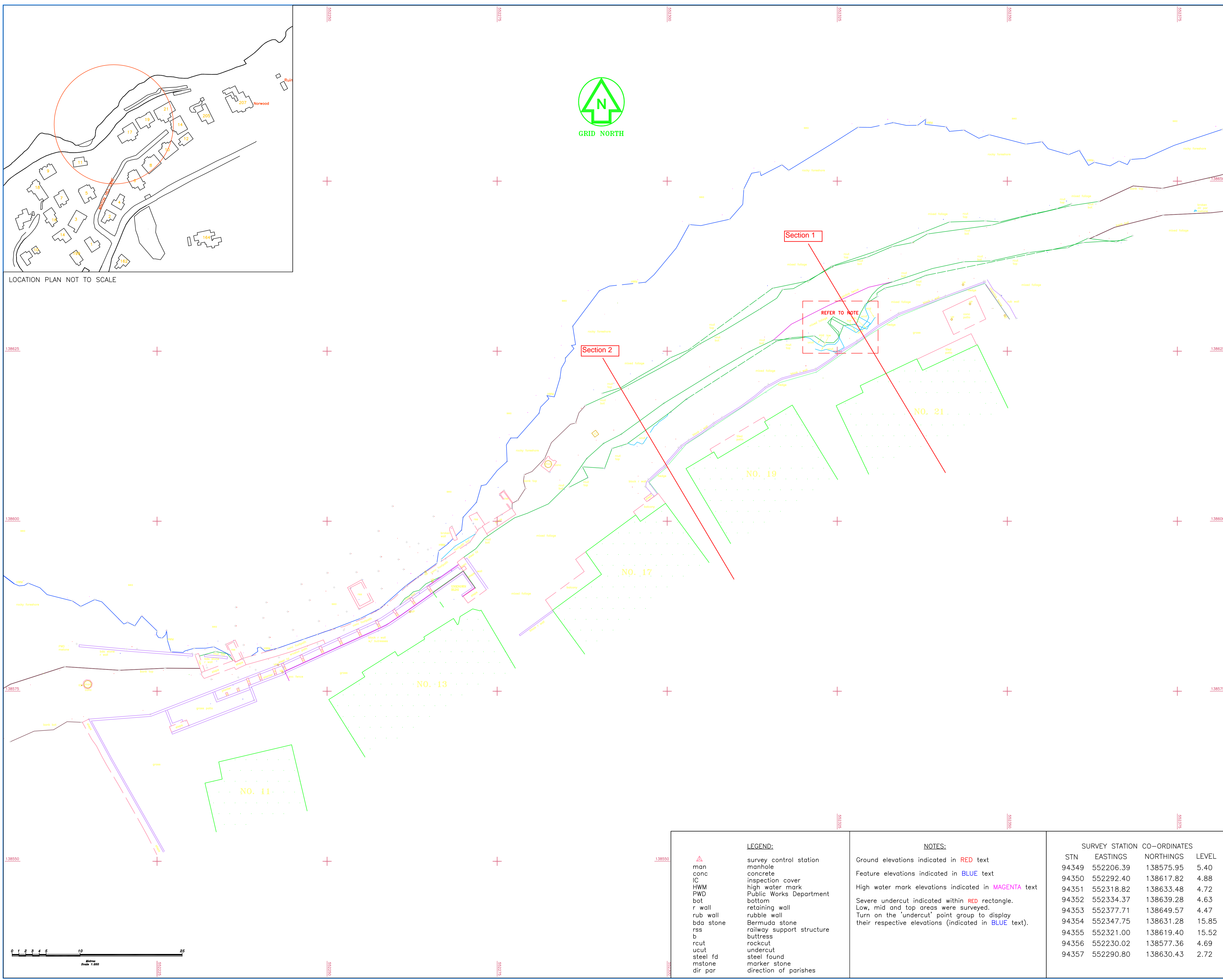
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WATERFRONT**

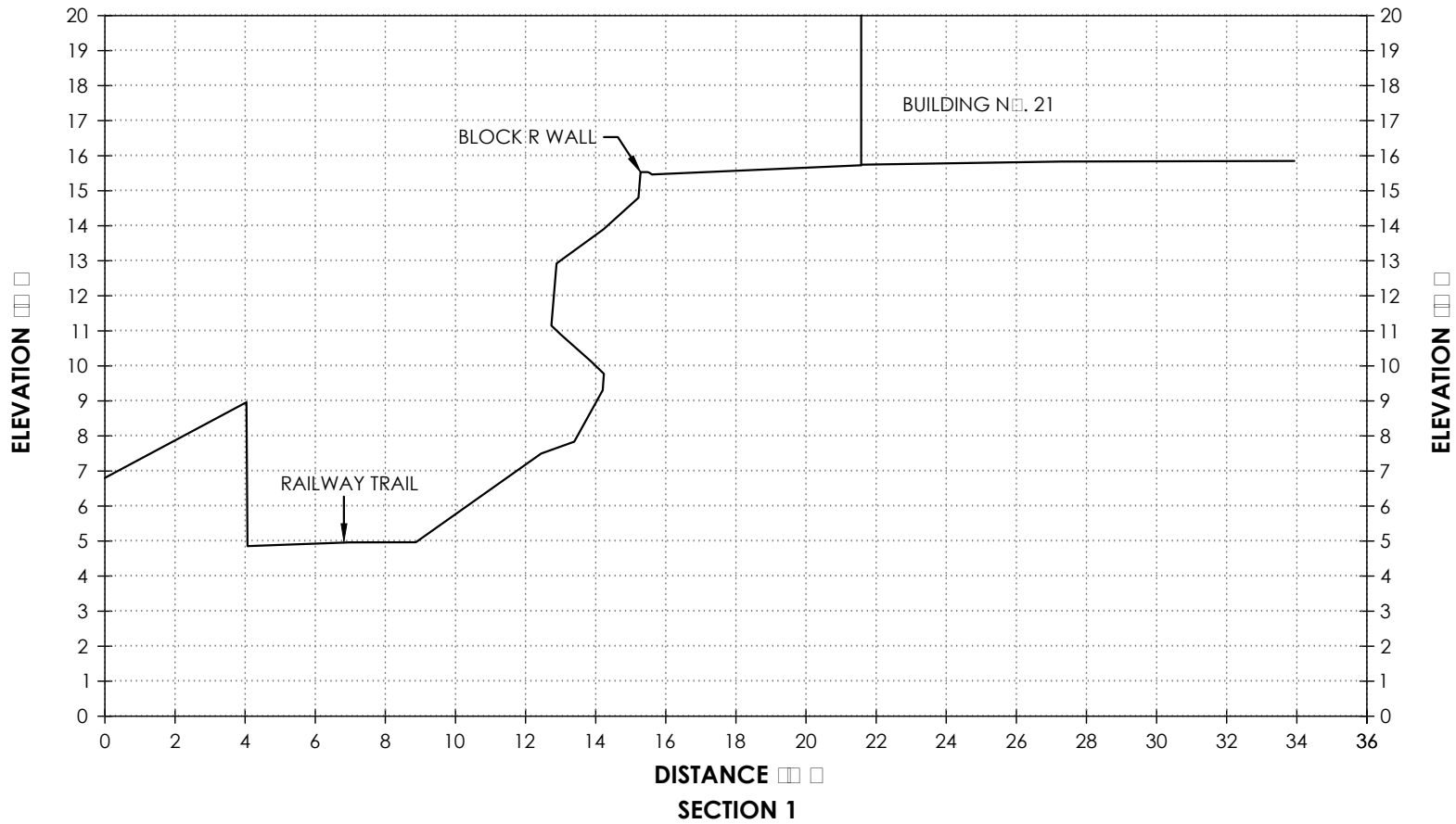
SHEET NUMBER: **5238/006/02** REVISION



LOCATION PLAN NOT TO SCALE



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—	b		94357	552290.80	138630.43	2.72
—	rcut					
—	ucut					
—	steel fd					
—	mstone					
—	dir par					



THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

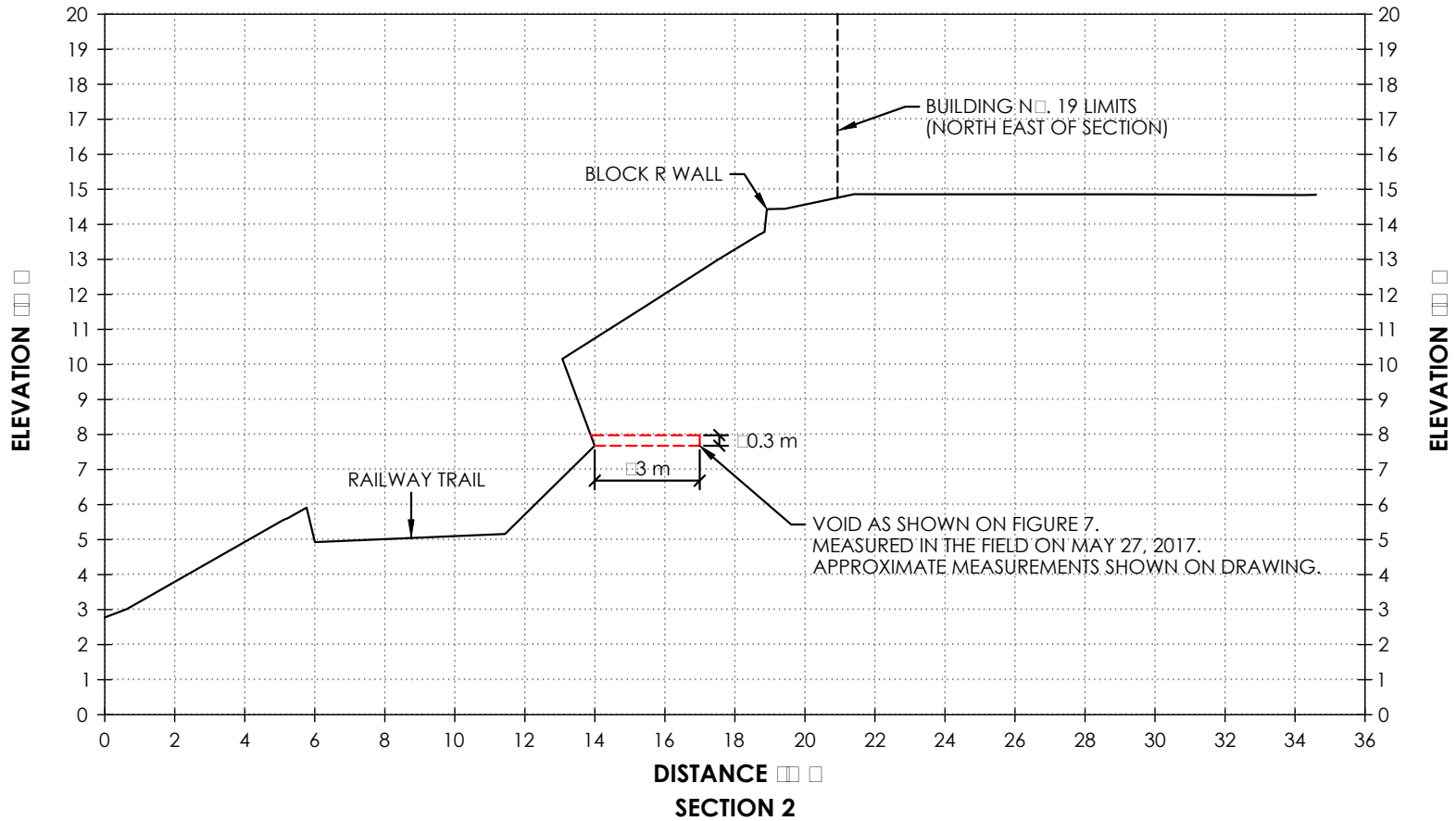
SECTION 1 (LOOKING NORTH EAST)
 ROCK SLOPE STABILITY ASSESSMENT WINTON HILL, REVISION 1, HAMILTON PARISH, BERMUDA

Job No.:	1276585786
Scale:	1 : 200
Date:	2017 06 19
Dwn. By:	JL
App'd By:	JN

Dwg. No.: SEC-1



Client: GOVERNMENT OF BERMUDA - MINISTRY OF WORKS AND ENGINEERING



THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

SECTION 2 (LOOKING NORTH EAST)
 ROCK SLOPE STABILITY ASSESSMENT WINTON HILL, REVISION 1, HAMILTON PARISH, BERMUDA

Client: GOVERNMENT OF BERMUDA - MINISTRY OF WORKS AND ENGINEERING

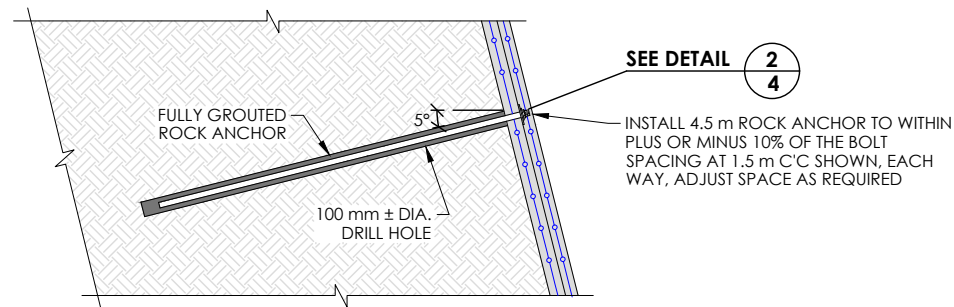
Job No.: 1276585786
Scale: 1 : 200
Date: 2017 06 19
Dwn. By: JL
App'd By: JN

Dwg. No.: SEC-2

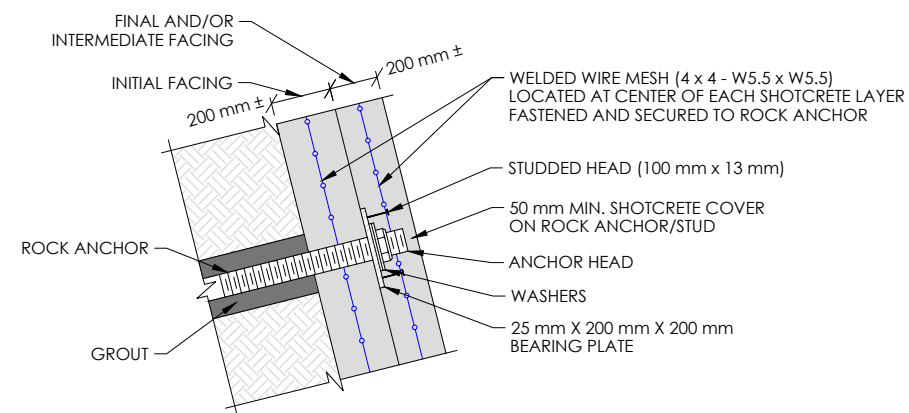


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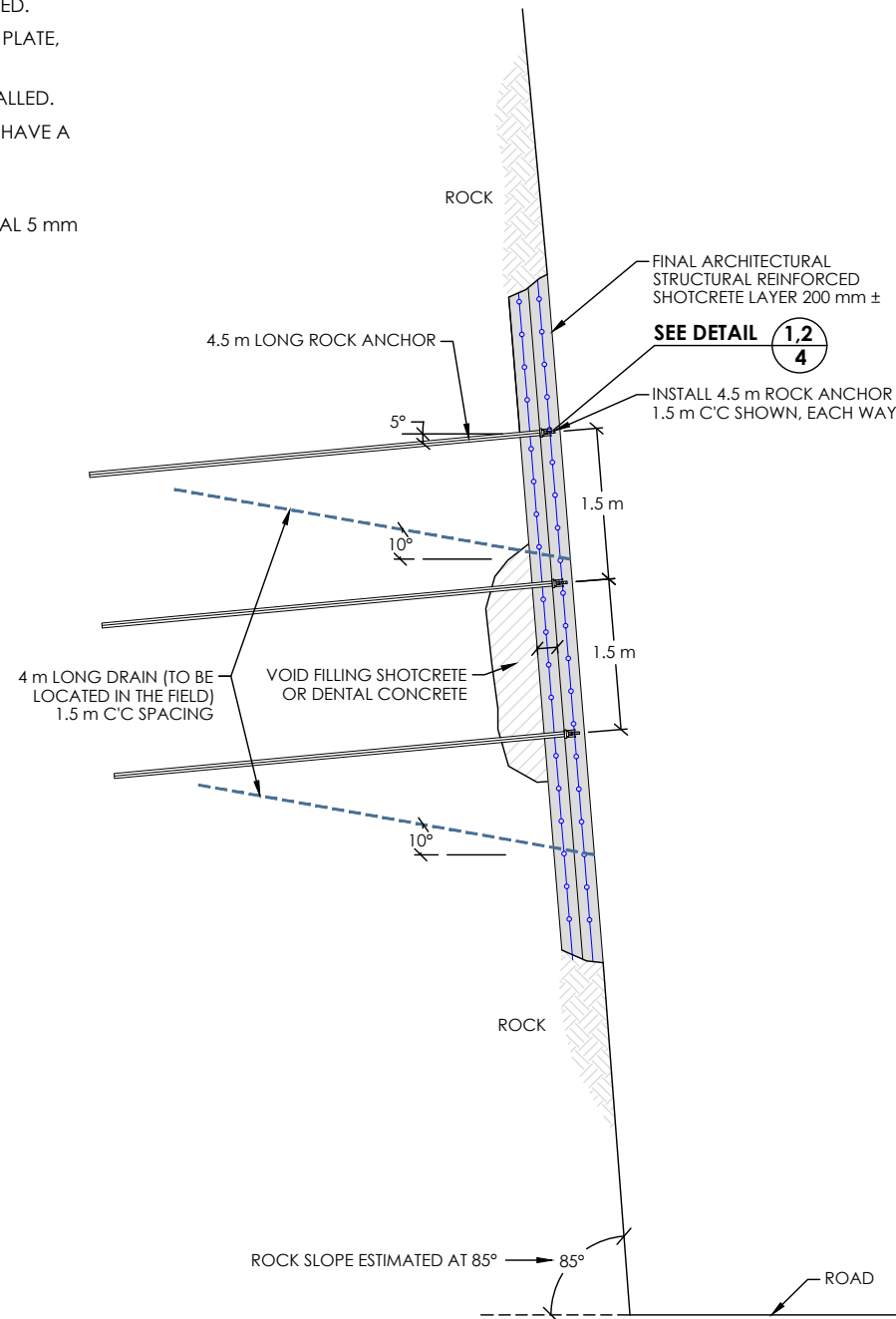
1. INSTALL ROCK ANCHORS AT LOCATIONS AS PER SPECIFICATIONS AND DRAWINGS. FACE PLATES AND TENSIONING NOT COMPLETED AT THIS STAGE. ENSURE ROCK ANCHORS ARE INSTALLED TO DEPTHS ENSURING FREE LENGTH END IS WITHIN ± 50 mm OF THE FINAL SHOTCRETE FACE. REFER TO ANCHOR DETAIL 2/4.
2. FILL VOIDS WITH SHOTCRETE OR DENTAL CONCRETE AT LOCALIZED DEEP CAVITIES WHERE REQUIRED. PLACE VOID FILLING SHOTCRETE IN MULTIPLE LAYERS IN ± 200 mm LAYERS. DO NOT ENCROACH WITHIN STRUCTURAL LAYER. LOCATION TO BE DETERMINED IN THE FIELD.
3. FOLLOWING PLACEMENT AND CURE OF VOID FILL, FIRST LAYER OF STRUCTURAL SHOTCRETE SHOULD BE INSTALLED.
4. FOLLOWING INSTALLATION OF INITIAL SHOTCRETE LAYER, COMPLETE ROCK ANCHOR INSTALLATION WITH FACE PLATE, WASHERS, AND NUTS. TENSION ROCK ANCHORS TO NOMINAL 45 KN AS PER SPECIFICATION.
5. ADDITIONAL LAYERS OF STRUCTURAL SHOTCRETE, AS REQUIRED AS SHOWN ON THE DRAWING SHOULD BE INSTALLED.
6. FINAL LAYER OF SHOTCRETE REFERRED TO AS "ARCHITECTURAL SHOTCRETE", MEANING THE FINAL LAYER SHALL HAVE A COLOUR AND FACE TEXTURE/PATTERN AS PER THE SPECIFICATIONS.
7. DRAIN HOLES DRAINAGE PIPES SHOULD BE INSTALLED AFTER ARCHITECTURAL SHOTCRETE IS CURED.
8. DRAIN HOLES SHALL BE COVERED WITH A GALVANIZED WIRE MESH NETTING (BIRD SCREENS) HAVING A NOMINAL 5 mm OPENING TO PREVENT BIRDS FROM ENTERING THE HOLES.



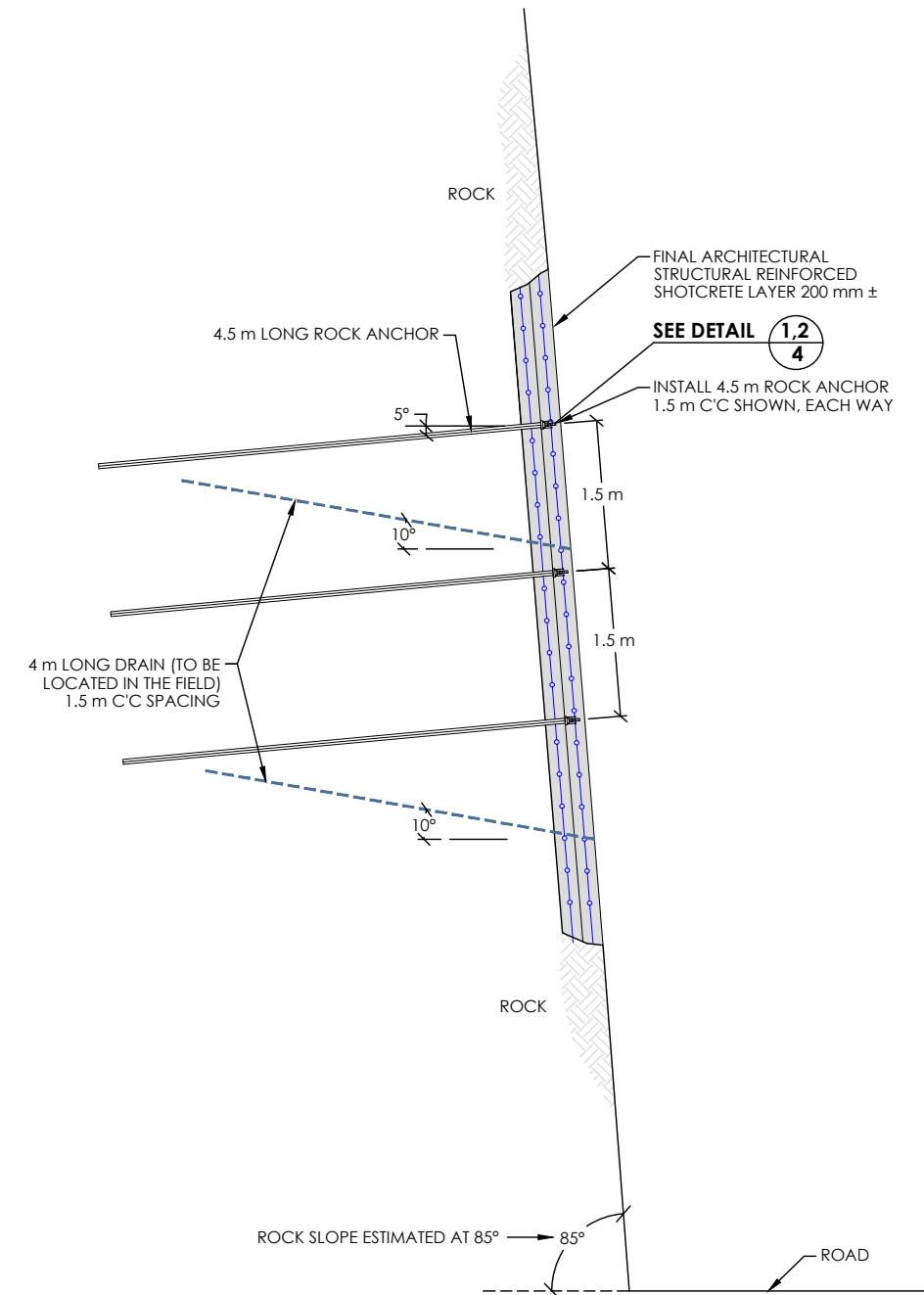
TYPICAL ROCK ANCHOR DETAIL 1/4
N.T.S.



ANCHOR DETAIL 2/4
N.T.S.



TYPICAL SHOTCRETE SECTION DETAIL WITH VOID FILLING SHOTCRETE OR DENTAL CONCRETE 3/4
N.T.S.



TYPICAL SHOTCRETE SECTION DETAIL 4/4
N.T.S.

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Reference:

SHOTCRETE AND ROCK ANCHOR DETAILS

Client: GOVERNMENT OF BERMUDA

Job No.: 1276585786

Scale: N.T.S.

Date: 2017 09 28

Dwn. By: JL

App'd By: JN

Dwg. No.: 4

