Rail Protection Report
51-57 TANNERY STREET

Prepared For
Montcrest Asset Management

By

Jablonsky, Ast and Partners
Consulting Engineers
400-3 Concorde Gate
Toronto, ON
M3C 3N7

JAP Project No. 23096

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Scope and Context

This report has been prepared to establish the structural implications of providing a rail protection for a proposed residential development from the detrimental consequences of an accidental derailment of trains beside the property.

The proposed development is located at 51-57 Tannery St in Mississauga and is located immediately west a CP rail corridor (Galt Subdivison Mile 17.35) which also carries Go Rail Service. The development consists of two residential towers at 51-57 Tannery St in Mississauga and will be setback 25m from the easternmost mutual property line. The site will require rail protection along its east property line which is proposed to be in the form of an earthen berm.

The site was previously submitted and approved in 2021 / 2021 (JAP #20219, AECOM #6015447). The project at that time was a townhouse development protected by an earthen berm for the north portion of the site and a crash wall for the south portion of the site. That development was also set back 25m.

Berm Design Criteria

We have reviewed the "Guidelines for New Development in Proximity to Railway Operations" prepared by the Federation of Canadian Municipalities and the Railway Association of Canada dated May 2013. Based on the type of rail line, the standard berm with a 30m setback should have a minimum height of 2.5m with side slopes not greater than 2.5 to 1. It also acknowledges that reduction in setback of up to 5m can be achieved with an increase in height of the berm. Based on this and response memo from Aecom dated December 1, 2020, the standard berm for a 25m setback would have a minimum height of 3m with side slopes not greater than 2.5 to 1. This equates to a cross sectional area of 22.5m^3/m width.

We have chosen to provide a berm with a steeper railside slope to maximize useability of the site area. This berm has a height greater than or equal to 3m high and has a cross section greater than or equal to 22.5m^3/m. See Appendix A for site plan and berm cross sections and Appendix B for berm cross section calculations.

To act as a return at each end, the berm at the north and south ends extends beyond the face of the building and the minimum berm height of 3m has been provided up to a distance of 6m from the mutual property line.

Conclusions

This report has been prepared to examine the option of providing a crash barrier to protect the structure behind it from the effects of a train derailment. Based on the forces provided in the

AECOM guidelines, the berm provided will provide at least the same level of rail safety for nearby residents, workers, visitors, and shoppers as the required 30m setback and berm.

Disclaimer

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We trust the foregoing will be of use. Should you have any questions, please do not hesitate to contact the office.

Yours very truly,

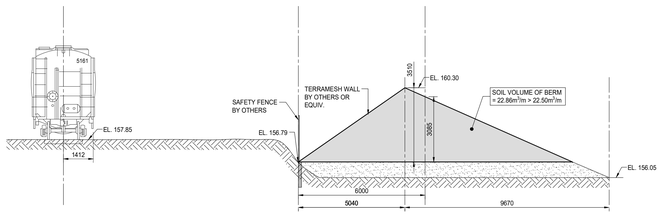
JABLONSKY AST & PARTNERS
CONSULTING ENGINEERS

Craig Slama, P. Eng.

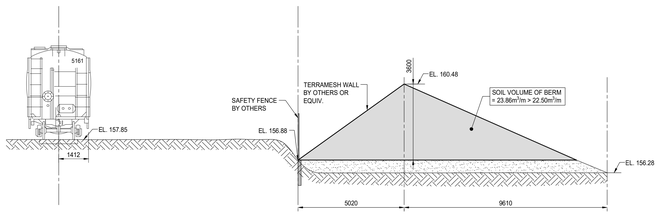
APPENDIX ‘A’

Site Plan and Sections

DERAILMENT PLAN
SCALE N.T.S.



SECTION 1
SCALE 1:100 SKS-1



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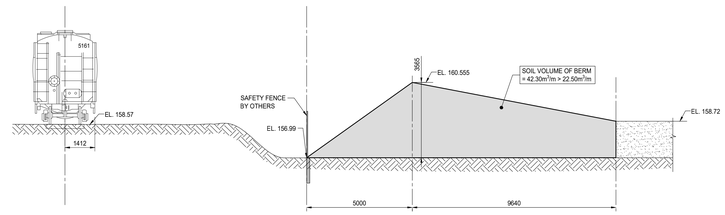

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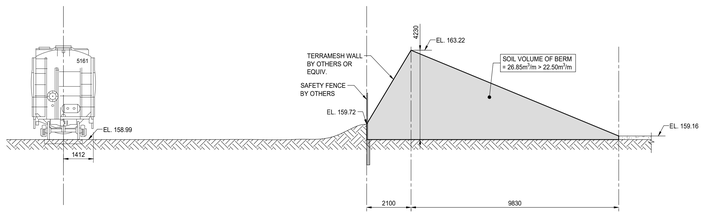

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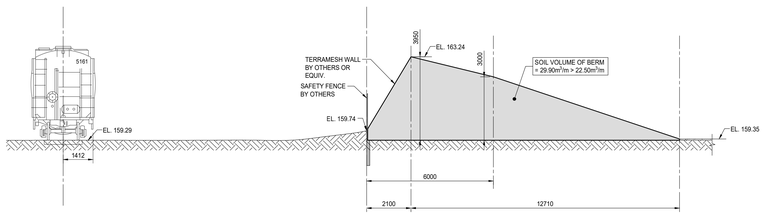

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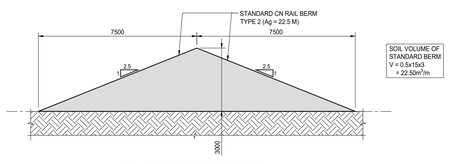
SCALE 1:100 SKS-1



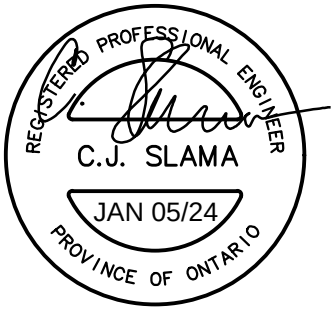
3M STANDARD BERM
SCALE 1:100 SKS-1

Jablonsky, Ast and Partners
CONSULTING ENGINEERS
400-3 CONCORDE GATE
TORONTO, ON., M3C 3N7
TEL. 416-447 7405
FAX 416-447 2771

PROJECT/DWG. TITLE	57 TANNERY DERAILMENT PLAN
JOB NUMBER	23096
DRAWN C.C.	DATE 2024-01-05
SCALE AS NOTED	SKETCH No SKS-1

APPENDIX ‘B’

Berm Cross Section Calculations



JAP Berm Volume Calculator

Job Name:	51-57 Tannery
Job #:	23096
Description:	1 / SKS-1

STANDARD BERM PROPERTIES

h_{30m}	=	required berm height based on 30m setback	=	2.50	m
s	=	berm slope	=	2.50	
SB	=	proposed setback distance	=	25	m
h_{STD}	=	standard berm height = h_{30m} - (30-SB) * 0.1	=	3.00	m
w_{STD}	=	standard berm width = h_{STD} * s * 2	=	15.00	m
A_{STD}	=	standard berm area = h_{STD} * w_{STD} / 2	=	22.50	m^2/m

BERM GEOMETRY

EL_R	=	top of rail elevation	=	157.85	masl
EL_{PL}	=	elevation at property line	=	156.79	masl
EL_T	=	elevation at toe of slope	=	156.05	masl
EL_P	=	elevation at peak of berm	=	160.30	masl
d_1	=	distance from property line to peak	=	5,040	mm
d_2	=	distance from peak to slope toe	=	9,670	mm
EL_B	=	base of berm elevation = MIN (EL_R, EL_{PL})	=	156.79	mm
h	=	height of berm = EL_P - EL_B	=	3,510	mm
h_{PL}	=	height of berm at PL = EL_{PL} - EL_B	=	-	mm
d_3	=	distance from peak to berm toe = d2 * (EL_P - EL_B) / (EL_P - EL_T)	=	7,986	mm
A	=	d_1 * (h + h_{PL}) / 2 + d_3 * h / 2	=	22.86	m^2/m
$A > A_{REQ}$	=	area check	=	OK	
$h > h_{REQ}$	=	height check	=	OK	

JAP Berm Volume Calculator

Job Name:	51-57 Tannery
Job #:	23096
Description:	2 / SKS-1

STANDARD BERM PROPERTIES

h_{30m}	=	required berm height based on 30m setback	=	2.50	m
s	=	berm slope	=	2.50	
SB	=	proposed setback distance	=	25	m
h_{STD}	=	standard berm height = h_{30m} - (30-SB) * 0.1	=	3.00	m
w_{STD}	=	standard berm width = h_{STD} * s * 2	=	15.00	m
A_{STD}	=	standard berm area = h_{STD} * w_{STD} / 2	=	22.50	m^2/m

BERM GEOMETRY

EL_R	=	top of rail elevation	=	157.85	masl
EL_{PL}	=	elevation at property line	=	156.88	masl
EL_T	=	elevation at toe of slope	=	156.28	masl
EL_P	=	elevation at peak of berm	=	160.48	masl
d_1	=	distance from property line to peak	=	5,020	mm
d_2	=	distance from peak to slope toe	=	9,610	mm
EL_B	=	base of berm elevation = MIN (EL_R, EL_{PL})	=	156.88	mm
h	=	height of berm = EL_P - EL_B	=	3,600	mm
h_{PL}	=	height of berm at PL = EL_{PL} - EL_B	=	-	mm
d_3	=	distance from peak to berm toe = d2 * (EL_P - EL_B) / (EL_P - EL_T)	=	8,237	mm
A	=	d_1 * (h + h_{PL}) / 2 + d_3 * h / 2	=	23.86	m^2/m
$A > A_{REQ}$	=	area check	=	OK	
$h > h_{REQ}$	=	height check	=	OK	

JAP Berm Volume Calculator

Job Name:	51-57 Tannery
Job #:	23096
Description:	3 / SKS-1

STANDARD BERM PROPERTIES

h_{30m}	=	required berm height based on 30m setback	=	2.50	m
s	=	berm slope	=	2.50	
SB	=	proposed setback distance	=	25	m
h_{STD}	=	standard berm height = h_{30m} - (30-SB) * 0.1	=	3.00	m
w_{STD}	=	standard berm width = h_{STD} * s * 2	=	15.00	m
A_{STD}	=	standard berm area = hSTD * w_{STD} / 2	=	22.50	m^2/m

BERM GEOMETRY

EL_R	=	top of rail elevation	=	158.57	masl
EL_{PL}	=	elevation at property line	=	156.99	masl
EL_T	=	elevation at toe of slope	=	158.72	masl
EL_P	=	elevation at peak of berm	=	160.56	masl
d_1	=	distance from property line to peak	=	5,000	mm
d_2	=	distance from peak to slope toe	=	9,640	mm
EL_B	=	base of berm elevation = MIN (ELR, ELPL)	=	156.99	mm
h	=	height of berm = ELP - ELB	=	3,565	mm
h_{PL}	=	height of berm at PL = ELPL - ELB	=	-	mm
d_3	=	distance from peak to berm toe = d2 * (ELP - ELB) / (ELP - ELT)	=	18,728	mm
A	=	d1 * (h + hPL) / 2 + d3 * h / 2	=	42.30	m2/m
$A > A_{REQ}$	=	area check	=	OK	
$h > h_{REQ}$	=	height check	=	OK	

JAP Berm Volume Calculator

Job Name:	51-57 Tannery
Job #:	23096
Description:	4 / SKS-1

STANDARD BERM PROPERTIES

h_{30m}	=	required berm height based on 30m setback	=	2.50	m
s	=	berm slope	=	2.50	
SB	=	proposed setback distance	=	25	m
h_{STD}	=	standard berm height = h_{30m} - (30-SB) * 0.1	=	3.00	m
w_{STD}	=	standard berm width = h_{STD} * s * 2	=	15.00	m
A_{STD}	=	standard berm area = h_{STD} * w_{STD} / 2	=	22.50	m^2/m

BERM GEOMETRY

EL_R	=	top of rail elevation	=	158.99	masl
EL_{PL}	=	elevation at property line	=	159.72	masl
EL_T	=	elevation at toe of slope	=	159.16	masl
EL_P	=	elevation at peak of berm	=	163.22	masl
d_1	=	distance from property line to peak	=	2,100	mm
d_2	=	distance from peak to slope toe	=	9,830	mm
EL_B	=	base of berm elevation = MIN (EL_R, EL_{PL})	=	158.99	mm
h	=	height of berm = EL_P - EL_B	=	4,227	mm
h_{PL}	=	height of berm at PL = EL_{PL} - EL_B	=	730	mm
d_3	=	distance from peak to berm toe = d2 * (EL_P - EL_B) / (EL_P - EL_T)	=	10,242	mm
A	=	d_1 * (h + h_{PL}) / 2 + d_3 * h / 2	=	26.85	m^2/m
$A > A_{REQ}$	=	area check	=	OK	
$h > h_{REQ}$	=	height check	=	OK	

JAP Berm Volume Calculator

Job Name:	51-57 Tannery
Job #:	23096
Description:	5 / SKS-1

STANDARD BERM PROPERTIES

h_{30m}	=	required berm height based on 30m setback	=	2.50	m
s	=	berm slope	=	2.50	
SB	=	proposed setback distance	=	25	m
h_{STD}	=	standard berm height = h_{30m} - (30-SB) * 0.1	=	3.00	m
w_{STD}	=	standard berm width = h_{STD} * s * 2	=	15.00	m
A_{STD}	=	standard berm area = h_{STD} * w_{STD} / 2	=	22.50	m^2/m

BERM GEOMETRY

EL_R	=	top of rail elevation	=	159.29	masl
EL_{PL}	=	elevation at property line	=	159.74	masl
EL_T	=	elevation at toe of slope	=	159.35	masl
EL_P	=	elevation at peak of berm	=	163.24	masl
EL_{P2}	=	elevation at secondary peak of berm	=	162.03	masl
d_1	=	distance from property line to peak	=	2,100	mm
d_2	=	distance from peak to slope toe	=	12,650	mm
d_4	=	distance from peak to secondary peak	=	3,900	mm
EL_B	=	base of berm elevation = MIN (EL_R, EL_{PL})	=	159.29	mm
h	=	height of berm = EL_P - EL_B	=	3,950	mm
h_2	=	height of berm at secondary peak = EL_{P2} - EL_B	=	2,737	mm
h_{PL}	=	height of berm at PL = EL_{PL} - EL_B	=	450	mm
d_3	=	distance from peak to berm toe = d2 * (EL_P - EL_B) / (EL_P - EL_T)	=	12,845	mm
A	=	d_1 * (h + h_{PL}) / 2 + d4 * (h + h_2) / 2 + (d_3-d_4) * h_2 / 2	=	29.90	m^2/m
$A > A_{REQ}$	=	area check	=	OK	
$h > h_{REQ}$	=	height check	=	OK	