GROUND HAZARD RISK ASSESSMENT REPORT

Field Inspection Form (GHSR) · Sheet 1 of 3 · Desktop Study Summary

Site ID: _____ Project No.: _____
Subdivision: _____ MP _____ to MP _____

BLOCK A — DESKTOP STUDY SUMMARY (blue cells pre-filled before mobilizing; confirm ✓ or write the revised value in the field)

A1 · Static network screening and entry route

Segment ID		**CHI value / network rank**		**Event count (2000–24)**	
Entry route	☐ Network screening ☐ Recurring geometry defect ☐ Visible ground hazard ☐ Slow order				

A2 · Driving mechanism and trigger (Section 2.9.2.3; Section 2.8.1)

Desk: primary		**Desk: contributing**		**Field: confirm / revise**	

☐ Slope ☐ Scour ☐ Drainage ☐ Subgrade ☐ Subsidence ☐ Rock and debris — weighted attribute (×2): Slope L3 · Scour L4 · Drainage L5 · Subgrade L1 · Subsidence or rock L2

Primary trigger (Table 2.8-2)			**Trigger rating T (Table 2.8-3)**		**Uncertain trigger: T ≥ 3**

A3 · Situational likelihood (Table 2.9-8) / A4 · Consequence (Table 2.9-9)

Attribute	Desk	Wt	Field	Basis / note	Attribute	Desk	Field	Basis / note
L1 Surficial soils					C1 Track and traffic			
L2 Geologic setting					C2 Train type			
L3 Slope geometry					C3 Below and beside			
L4 Hydrology					C4 Size of failure			
L5 Drainage condition					C5 Redundancy			
$L_S = \Sigma(w \cdot L) / \Sigma w$				Missing data scored 3 and flagged in A8	**C** (floor 4 if C2 or C3 = 5) → **S**			

A5 · Instability: geospatial frequency and defect rating (Sections 2.8.2 and 2.9.3)

L6 Historic instability		**Field**		**Basis (repairs, scarps, InSAR)**	
$L = [\Sigma(w \cdot L1–5) + L6] / [\Sigma w + 1]$, round half up			F_g = lesser of L and T (Eq. 2.8-1)		
Reported defects	*Cross level · Profile · Alignment · Warp* — count: ___		**Surfaced at this location in last 12 months (times)**		**Last slow order** (date, mph):
Defect rating D (Tables 2.8-4, 2.9-15)	☐ 1 None ☐ 2 Historic ☐ 3 Present ☐ 4 Recurring ☐ 5 Active			**D desk / field**	/
Desk $F_c = F_p$ (Table 2.8-5, from F_g and D)			**Field F_c (after field D)**		

A6 · Static (preliminary) rating (Section 2.9.4; Section 2.8.4)

F_p		**S_p**		**$R_p = F_p \times S_p$ (Table 2.9-4)**	
Rating	**Severe** **High** **Elevated** **Guarded** **Low**				
Driven by	☐ Location (F_g) ☐ Track (D) ☐ Consequence (S)				
Priority (Table 2.9-17)		**Level of effort**			

A7 · H&H thresholds (Table 2.9-10) and live rating at the time of the visit (Section 2.9.5)

Paired gauge (ID)			**Action stage (ft)**		**Moderate stage (ft)**
Toe stage (ft)		**Damage stage (ft)**		**Site rainfall / culvert capacity storm (in./24 h)**	
Antecedent (SM %ile)		**Thaw history**	☐ None ☐ Failed in thaw	**Field check: toe / outlet elev.**	
Live at visit (printed on day of visit) — N = Normal, W = Watch, X = Warning					
Stage now / 48-h fcst		**Rain obs + fcst (in.)**		**Soil moisture %ile / NWS alert**	
Indicator levels	Stage __ · Rain __ · Wetness __ · Thaw __ · Alert __		**$F_{live} = F_p +$ __**		**Live rating:**

A8 · Questions for the field (attributes scored 3 for lack of data; features seen in lidar or imagery; culverts and outlets to find and measure)

Question (desk)	Answer (field) · photo no.
1	
2	
3	
4	
Desk study prepared by / date	
Attachments in field package	☐ Site map / MINA KMZ ☐ Site history summary ☐ Site Background Report ☐ Photos

GROUND HAZARD RISK ASSESSMENT REPORT

Field Inspection Form (GHSR) · Sheet 2 of 3 · Site Information, Conditions and Instabilities

Site ID: _____ Date: _____
Preliminary rating (from A6): _____

BLOCK 1 — GENERAL SITE INFORMATION

Client		**Subdivision**		**Project No.**	
RR contact / phone		**Milepost**		**Date**	
EIC / phone		**Operational characteristic**		**Current weather**	
Protection type		**Avg daily train traffic**		**Geologic setting**	
From MP / To MP		**No. of tracks / which higher**		**Track cross section**	☐ Cut ☐ Fill
Place of safety		**Normal / slow order speed (mph)**		**Alignment**	☐ Tangent ☐ In ☐ Out
Population density factor		**Date of last issue**		**Track setting**	☐ Marsh ☐ Valley ☐ Slope T/M/B
Affected track length (ft)		**Exposure agrees with A4 (C1–C5)?**		☐ Yes ☐ No — revise S in Block 6	

BLOCK 2 — SITE CONDITIONS (LOOKING UP STATION, TOWARD INCREASING MP) — instability indicators, Section 18.3.4

Left embankment	Between the rails	Right embankment
☐ Upper slope: bulge · crack · seep	☐ Cross level *Meas.* ___ *Freq.* ___	☐ Upper slope: bulge · crack · seep
☐ Mid-slope: bulge · crack · seep	☐ Profile *Meas.* ___ *Freq.* ___	☐ Mid-slope: bulge · crack · seep
☐ Lower slope: bulge · crack · seep	☐ Alignment *Meas.* ___ *Freq.* ___	☐ Lower slope: bulge · crack · seep
☐ Standing water in ditch / at toe	☐ Warp *Meas.* ___ *Freq.* ___	☐ Standing water in ditch / at toe
☐ Obstruction in ditch	☐ Fouled ballast / water between cribs	☐ Obstruction in ditch
☐ Culvert: dry · obstructed · damaged	☐ Tie shift	☐ Culvert: dry · obstructed · damaged
☐ Water level higher than opposite side	☐ Voids between cribs	☐ Water level higher than opposite side
☐ Erosion	☐ Shoulder narrower than 12 in.	☐ Erosion
☐ _____	☐ _____	☐ _____

Photo nos.: _____ Pattern observed (Section 18.3.4): _____

BLOCK 3 — SITE INSTABILITIES (Section 18.3.5)

Major element (number; governing = 1)	Construction constraint	Estimated failure type (P = primary, C = contributing)
__ Ballast	☐ Access and mobility	__ Bearing capacity
__ Subgrade	☐ Railroad workload conflict	__ Slope
__ Foreslope	☐ Property	__ Settlement
__ Backslope	☐ Material	__ Washout
__ Bridge abutment	☐ Underground obstructions / utilities	__ Subsidence
__ Culvert	☐ Water source	__ Surface erosion
__ Ditch	☐ Permit	__ Stream and wave erosion
__ Adjacent property	☐ Environmental	__ Underground flow erosion
Failure type agrees with desk driving mechanism (A2)? ☐ Yes ☐ No — note:		

GROUND HAZARD RISK ASSESSMENT REPORT

Field Inspection Form (GHSR) · Sheet 3 of 3 · Alternatives, Services and Risk Rating

Site ID: _____ Date: _____

BLOCK 4 — RECOMMENDED STABILIZATION ITEMS (write the alternative number(s) beside each marked item)

Engineering studies	Engineering disciplines	Drainage	Earthwork	Structural
☐ Site monitoring: track forces __	☐ H&H __	☐ Dewater __	☐ Grading __	☐ Load transfer __
☐ Site monitoring: instrumentation __	☐ Geotechnical __	☐ Remove obstruction __	☐ Stiffen subgrade __	☐ Earth retention __
☐ H&H study __	☐ Structural __	☐ Ditching __	☐ Remove and replace __	☐ Repair __
☐ Geotechnical exploration __	☐ Civil __	☐ Erosion control __	☐ Counter (toe) berm __	☐ Replace __

BLOCK 5 — ADDITIONAL SUBSURFACE EXPLORATION, FIELD TESTING AND ENGINEERING SERVICES

Group	Service	Alt 1	Alt 2	Alt 3	Est. cost (low)	Est. cost (high)
Subsurface exploration	Surveying					
	Soil survey borings					
	Modified SPT soil survey borings					
	SPT borings					
Field testing	Dynamic cone penetrometer (DCP)					
	Field CBR					
	Inclinometer					
	Piezometer					
	Lateral trench test pit					
	Ground penetrating radar (GPR)					
Engineering	Laboratory testing					
	Geotechnical analysis					
	Structural analysis					
	Design bid package					
	Construction monitoring					
Total by alternative						

BLOCK 6 — GROUND HAZARD RISK RATING (Chapter 2.8) — circle the rating in each column

	Preliminary (A6)	Live at visit (A7)	Current (field)	Alt 1	Alt 2	Alt 3
Current risk · Section 2.8.2						
Trigger rating T				—	—	—
Geospatial frequency F_g				—	—	—
Defect rating D				—	—	—
Frequency F_p / F_{live} / F_c				—	—	—
Risk reduction · Sections 2.8.5 to 2.8.7						
Solution F_{sol} (2.8.5)	—	—	—			
Design F_{des} (Table 2.8-9)	—	—	—			
Construction stage F_{con} / S_{con} (Eq. 2.8-4)	—	—	—	/	/	/
Post-stabilization F_{post} (Table 2.8-10) P / V	—	—	—			
Rating						
Hazard severity S (S_{post})						
R = F × S (R_p, R_c or R_{res})						
Rating	Sev · High · Elev · Guard · Low	Sev · High · Elev · Guard · Low	Sev · High · Elev · Guard · Low	Sev · High · Elev · Guard · Low	Sev · High · Elev · Guard · Low	Sev · High · Elev · Guard · Low
Risk reduction (levels; R_c – R_{res})	—	—	—			
Reason for F and S	From desk study					
One-level adjustment (Section 2.9.1.6)? Reason:						
Field rating differs from preliminary by more than one level? Reason:						
Severe or High now: railroad contact told before leaving site (name, time)						
Alternative notes	Scope · services needed · completion time (Table 2.9-26) · expected rating					
EIC signature / date						
Senior technical reviewer						

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