Contract No. : GE / / Works Order No.+ : _____

Slope No. & Location: _____

Inspection/Survey Check Request Form

To Engineer's Representative Request No. : _____

This is a new submission/re-submission (previous request no. _____)*

(1)	Location of work		Date and Time
(2)	Work to be Inspected/Surveyed		
(3)	Work Proposed after Approval of (2)		
(4)	Remarks (if this is a re-submission state work carried out since last inspection/survey)		

REQUESTED BY : _____ TIME : _____

DESIGNATION : _____ DATE : _____

Received by ER/IOW/WS* TIME : _____ DATE : _____

Filled in by ER/IOW* Mr : _____ Please arrange inspection*

Mr : _____ Please check setting out*

SIGNED : _____ DATE : _____

Filled in by WS/IOW/Surveyor*

Work outlined in (2) above has been inspected/surveyed*. Permission to carry out proposed work outlined in (3) above is given/not given* for the following reason(s) :

_____

_____

_____

_____

This in no way limits or alters the Contractor's obligations under the Contract.
Form is returned to the Contractor at time stated below.

SIGNED : _____ TIME : _____

DESIGNATION : _____ DATE : _____

Received on behalf of Contractor by

NAME : _____ TIME : _____

SIGNED : _____ DATE : _____

Legends: + Leave blank if not applicable

* Delete as appropriate

N.B. Top copy - white - E.R.
Duplicate - yellow - Contractor

GEO/CA/23 (2/07/2002)

Contract No. : GE / / Works Order No.+ : _____

Slope No. & Location: _____

Soil Nail Record Sheet No. : _____

(use a separate sheet for each lot of soil nails grouted)

Soil Nail No.	Drillhole		Steel Bar		Date of Grouting	Volume of Grout Used (litres) (Note 2)	Remarks (Note 1)
	Diameter (mm)	Inclination (degree)	Diameter (mm)	Length (m)			

Length of steel bars measured by: _____ (WS/AIOW/IOW*) Date : _____

Installation of steel bars supervised by: _____ (WS/AIOW/IOW*) Date : _____

Grouting of soil nails supervised by: _____ (WS/AIOW/IOW*) Date : _____

Note 1 : Record all anomalies observed during nail installation and grouting. All anomalies observed must be reported to the ER immediately.

Note 2 : Volume of grout for each soil nail can be estimated based on average volume calculated from no. of bags of cement used for each session of grouting operation.

Legends :
* Delete as appropriate
+ Leave blank if not applicable

GEO/CA/12 (1/12/2003)

Contract No.: GE/ / Works Order No.* : _____

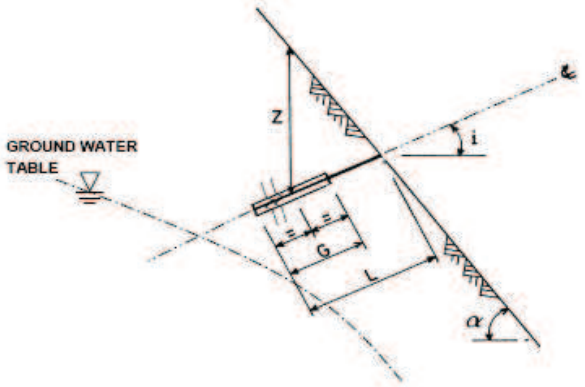
Slope No. & Location : _____

Soil Nail Pull-Out Test Record (Sheet 1 of 3 - Drilling and Grouting)

Pull-Out Test Ref. No.: _____

GENERAL RECORD

Co-ordinates of Head of Test Nail	N / E / mPD
Bar Length (L)	m
Bar Diameter	mm
Bar Steel Grade	
Specified Grouted Length (G)	m
Measured Grouted Length	m
Depth to Mid Point of Grouted Length (Z)	m
Slope Angle (α)	°
Bar Inclination (i)	°
Design Test Load, T_{DL1}	kN
Represented Row No. (refer to construction drawings)	
Nearest GI Station (can be more than one)	



Geological informaion (from G.I.)

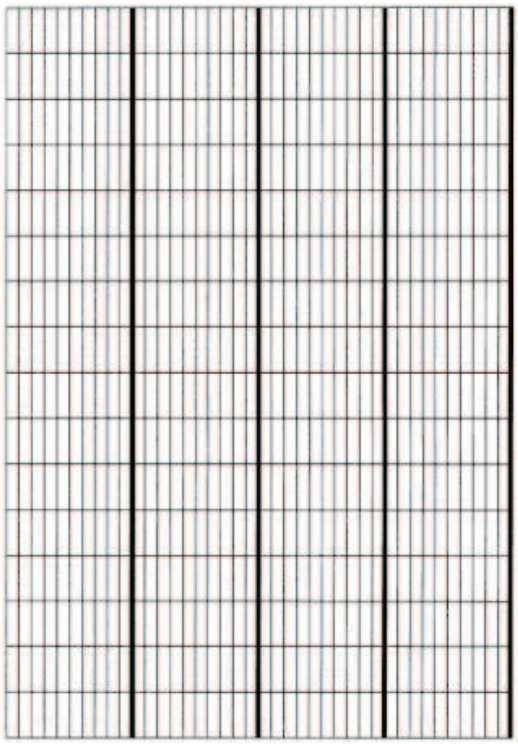
Material type at bonded section : _____

Groundwater information (from piezometer monitoring)

Groundwater table *below/ above bonded section : _____ m

Observations during drilling

1. Outflow from drillhole : * Yes / No
2. Condition of blow-out material from bonded section : * wet / dry * clayey / sandy
3. Others : _____ (e.g. collapse of drillhole)



DRILLING RECORD

DRILLING RECORDS

Hole Diameter	mm
Date Drilled	/ /
Drilling Method	
Flushing Medium	

GROUTING RECORD

Date of Grouting	/ /	Time of Efflux from Flow Cone Test (sec.)	
Grout Mix		3 day/7 day Cube Strength (MPa)	
Water Cement Ratio			
Calculated Grout Volume		Actual Grout Take	

Prepared By (Sheets 1 to 3): Pull-out Test (including drilling and grouting) supervised by :

(Contractor's Representative) (WS/AIOW/IOW*)(Date)

Legends : * Delete as appropriate + Leave blank if not applicable

GEO/CA/13-1 (15/8/2008)

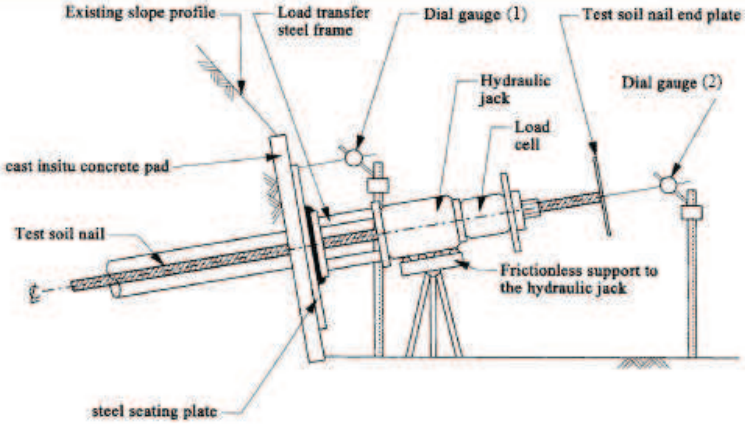
Contract No.: GE / / Works Order No.+ : _____

Slope No. & Location : _____

Soil Nail Pull-Out Test Record (Sheet 2 of 3 - Pull Out Test)

Pull-Out Test Ref. No. : _____ Date of Testing : _____

Legend : + Leave blank if not applicable



SEE NOTES ON SHEET 3

	T_a	kN
	T_{DL1}	kN
	T_{DL2}	kN
*	T_p / T_{ult}	kN
	T_{DL1}	mins.
	T_{DL2}	mins.
*	T_p / T_{ult}	mins.

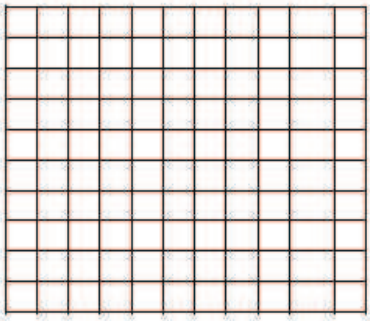
Notes : 1. Load T_{DL1}, T_{DL2} & T_p to be maintained for at least one hour

2. Load deformation measurements to be extended for another hour if the deformation exceeds the acceptance criterion for the first hour

3. Bar extension shall be based on the dial gauge (2) readings

Time after Test started (hr/min)	Pressure gauge Reading	Applied Load (kN)	Dial Gauge (1) Reading	Dial Gauge (2) Reading	Bar Extension (mm)

Position of Dial Gauge Probe on end plate



Show positions of Dial Gauge Probe tip at

1. commencement of test
2. T_a
3. T_{DL1}
4. T_{DL2}
5. $*T_p / T_{ult}$

Remarks :

Can the test nail sustain the following loadings

a. T_{DL1} (Y/N *)

b. T_{DL2} (Y/N *)

c. $*T_p / T_{ult}$ (Y/N *)

* Delete as appropriate

GEO/CA/13-2 (15/8/2008)

Contract No. : GE / / Works Order No.[+] : _____

Slope No. & Location: _____

Soil Nail Pull-Out Test Record (Sheet 3 of 3 - Pull Out Test Data Plotting Sheet)

Pull-Out Test Ref. No. : _____ Checked By : _____

(Design Engineer)

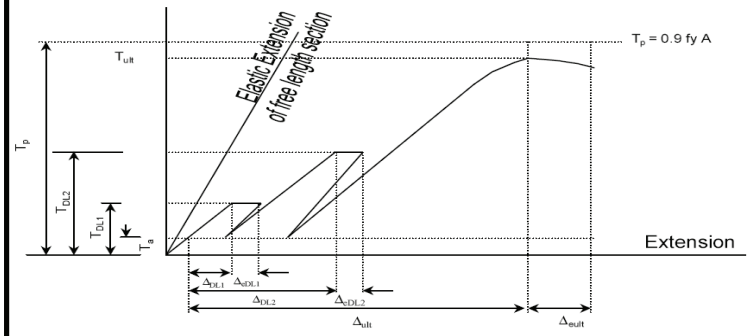
Legend : + Leave blank if not applicable

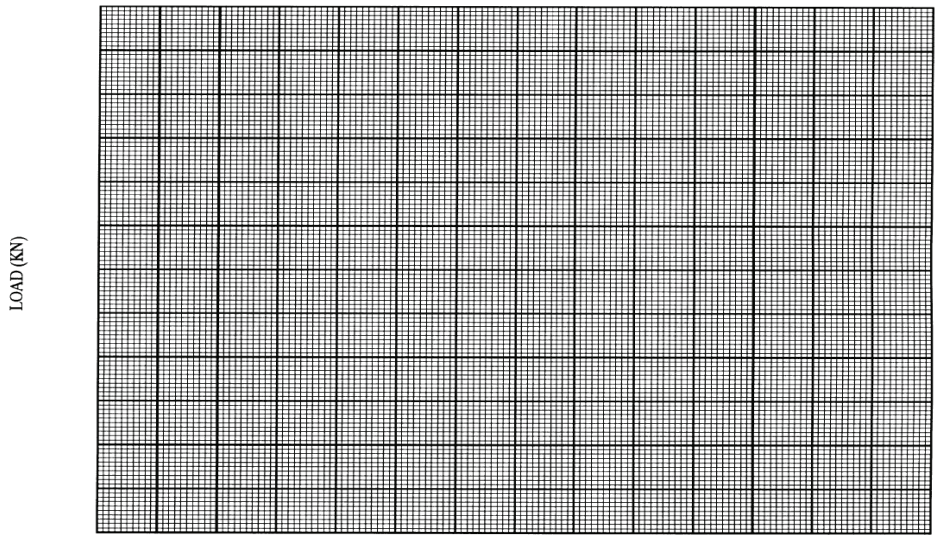
T_p	Δ_p	Δ_{ep}	${}^E\Delta_{ep}$
T_{ult}	Δ_{ult}	Δ_{eult}	
T_{DL2}	Δ_{DL2}	Δ_{eDL2}	${}^E\Delta_{eDL2}$
T_{DL1}	Δ_{DL1}	Δ_{eDL1}	${}^E\Delta_{eDL1}$
T_a			

NOTES :

Δ_{DL1}, Δ_{DL2} & Δ_p or Δ_{ult} :	Extensions up to time when load is maintained
Δ_{eDL1}, Δ_{eDL2} & Δ_{ep} or Δ_{eult} :	Extensions while the load is maintained for 60 min.
${}^E\Delta_{eDL1}$, ${}^E\Delta_{eDL2}$ & ${}^E\Delta_{ep}$:	Further extensions for additional 60 min. under the situation where Δ_{eDL1}, Δ_{eDL2} & Δ_{ep} exceeds the acceptance criteria

T_p shall be $0.9f_y$ x steel bar cross sectional area (A)
where f_y = yield strength of the steel bar
T_{ult} = The failure load, i.e. ultimate soil-grout bond load
$T_{DL2} = T_{DL1} \times F_p$
where F_p = Factor of safety against pull-out failure at soil-grout interface
T_{DL1} shall be the load corresponding to the allowable pull-out resistance of the test nail
T_a shall be T_{DL1} or 5% of T_p, whichever is smaller





ACCEPTANCE CRITERION :

At T_{DL1} and T_{DL2} cycles, $\Delta_{60\ min.} - \Delta_{6\ min.}$ (< 0.1% of Grouted Length of Test Nail or 2mm) = _____ mm

At T_{DL1} Cycle,

$\Delta_{60\ min.}$ = _____ mm $\Delta_{6\ min.}$ = _____ mm **Difference =** _____ mm

At T_{DL2} Cycle,

$\Delta_{60\ min.}$ = _____ mm $\Delta_{6\ min.}$ = _____ mm **Difference =** _____ mm

At T_p ,

$\Delta_{60\ min.}$ = _____ mm $\Delta_{6\ min.}$ = _____ mm **Difference =** _____ mm

Replacement Tests Required *Y / N

GEO/CA/13-3 (15/8/2008)

Contract No. : GE / / Works Order No.$^{+}$: _____ Sheet No. : _____

Slope No. & Location: _____

Concrete Test Cube Register (use a separate sheet for each concrete grade) Concrete Grade _____

Date of Cast	Location and/or Description of Works	Slump (mm)	Compliance (Y/N)	Test Certificate No.	Cube Mark	Date of Test	Age (days)	Density (Kg/m^3)	Compressive Strength (N/mm^2)	Test Result$^{\#}$ (N/mm^2)	Standard Deviation (N/mm^2)	Compliance Criteria	Compliance (Y/N)	Remarks (Follow-up action)

Legends : + Leave blank if not applicable

\# For definition of test result, refer to Clause 16.59(5) of GS (1992 Edition)

* Delete as appropriate

Prepared by:

_____

(WS/AIOW/IOW*)

GEO/CA/16 (2/07/2002)

Contract No. : GE / / Works Order No.+ : _____ Sheet No. : _____

Slope No. & Location: _____

Ready Mixed Concrete Delivery & Slump Test Record

Location of Works : _____ Date : _____

Concrete Grade/Mix No. : _____ Designed Slump : _____ mm Concrete Supplier : _____

Delivery Docket No.	Truck No.	Slump Tests				Time of			Quantity (m^3)		Cube Mark	Remarks
		Test 1		Test 2		Departure From Plant	Arrival On Site	Discharging Finished	This Load	Accumulated		
		(mm)	Type#	(mm)	Type#							
						:	:	:				
						:	:	:				
						:	:	:				
						:	:	:				
						:	:	:				
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Legends : + Leave blank if not applicable
Enter "T" for true slump, "S" for sheared slump and "C" for collapsed slump
* Delete as appropriate

Prepared By : _____
(Artisan/WS/AIOW/IOW*)

GEO/CA/17 (2/07/2002)

Contract No. : GE / / Works Order No.[+] : _____ Date of Grouting : _____

Slope No. & Location: _____ No. of Batches Mixed : _____

Cement Grout Testing Record

Ambient Temperature : _____ °C

Job : Soil Nails/Rock Bolts/Rock Dowels*

Reference No(s): _____

_____

Time of Grouting: Start : _____

Finish : _____

Materials :

Cement : Type : _____ Brand: _____

Water : Source : _____ W/C Ratio: _____

Admixture : Type : _____ Brand: _____

Others : (please specify) _____

Mix Proportion (per batch) :

Cement : _____ (Kg)

Water : _____ (litres/Kg)

Admixture : _____ (ml/gram)

Others : _____

Testing Apparatus :

Testing apparatus in clean and working conditions#.

Yes/No*

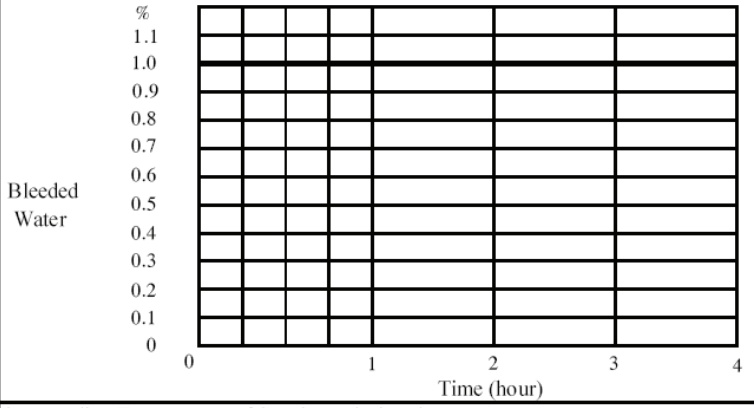
Fluidity (Flow-cone) Tests

Batch No. ♠	Time of Testing	Efflux Time (seconds)	Condition Satisfied
			Yes/No*
			Yes/No*
			Yes/No*
			Yes/No*
			Yes/No*
			Yes/No*
			Yes/No*
			Yes/No*
			Yes/No*
			Yes/No*

Acceptance Criteria :

Efflux time of grout ≥15 sec.

Bleeding Test



Surrounding Temperature of Specimen during the test = _____ °C

Time after test started	min			hour			
	15	30	45	1	2	3	4
water vol.(ml) in A							
bleeded %							
water vol.(ml) in B							
bleeded %							
water vol.(ml) in C							
bleeded %							

Acceptance Criteria :

(i) bleeded water at 3 hours ≤ 0.5 % — Condition Satisfied Yes/No*

(ii) bleeded water at maximum ≤ 1 % — Yes/No*

(iii) Water re-absorbed within 24 hours — Yes/No*

100 mm Test Cubes

Age at Test	Cube No. / Electronic Sample ID (Label)		
3 days	A	B	C
7 days	A	B	C
28 days	A	B	C

Remarks : (record here all abnormalties such as grout loss)

Bleeding Test Details :

Type of beaker used for bleeding test : Glass/PVC*/

Temperature of water used for mixing grout : _____ °C

Location of bleeding test : in site office/under shaded area

Volume of grout in beakers: Sample A _____ ml

Sample B _____ ml

Sample C _____ ml

Result : passed/failed*

Tests carried out/data recorded by:

(WS/AIOW/IOW*)(Date)

Legends : + Leave blank if not applicable ♠ to be selected at random * Delete as appropriate # Attach photographs of the testing apparatus e.g. flow cone, beakers for bleeding tests, etc.

GEO/CA/27 (26/01/2012)