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DELIVERABLE

D7.1 Standard for site condition metadata

Work package	WP7 -NA5: Networking databases of site and station characterization
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Reviewers	-
Approval	[Management Board]
Status	Final
Dissemination level	Public
Delivery deadline	31.01.2019
Submission date	31.01.2019
Intranet path	DOCUMENTS/DELIVERABLES/D7.1_final

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Summary

This report presents the description of the site condition metadata included in the European Geotechnical Database, a Europe-wide geotechnical, geological and site conditions inventory which is developed in Task 7.1 in close interaction with EPOS subtask 8.6.4. EGD aims to collect and harmonize data from national/regional databases, for both permanently instrumented sites and non-instrumented well-studied sites. In order to address in an efficient way different categories of end-users, EGD contains two levels of information. The 1st level parameters are considered as basic for the broader seismological and engineering community (e.g. V_{s30}, f_0, EC8 site class, general geological description), while the 2nd level parameters refer to more detailed, research-oriented information for site characterization (e.g., detailed profiles of V_s, V_p, Q_s, Q_p etc.)..

Introduction

The aim of the European Geotechnical Database service developed in SERA Task 7.1 in close interaction with EPOS subtask 8.6.4 is to gather and disseminate, in a homogenized way at European level, existing information useful for site characterization at the sites of permanent station installations or non-instrumented sites that have been adequately investigated through geophysical and geotechnical surveys. The designing of EGD involves two levels of information; the first level includes basic information such as shear wave velocity values over the top 30 meters of the soil column, V_{s30}, resonant frequency, f_0 and EC8 class, while the second level, more research-oriented, includes extended geophysical and geotechnical profiles.

The web-service (egd-epos.civil.auth.gr/) is currently hosted by AUTH, while its integration with EFEHR is under discussion.

EGD Parameters Description

EGD parameters naming follows closely the QuakeML representation. Additional parameters and restructuring of the QuakeML representation was required to meet the special needs of EGD. In the following, we provide a short description of the database fields forming the 1st and 2nd level of information:

1.1   EGD 1st Level Parameters Description

EGD 1st Level parameters are considered as basic for the broader engineering and seismological community. The parameters included in the 1st Level of EGD are given in Tables 1-3. Figure 1 illustrates the manual data entry for the 1st Level parameters of the EGD web-service.

Table 1: Fields of element "gd_owners"

Field Name	Description
authority_id	Unique identification code of the gd_owner
code_name	Short name of the entity, e.g. acronym in case of a research unit or working group
full_name	Full name of the entity
contact_full_name	Full name of a single person (or working group) that will be responsible for any communication pertinent to the provided geotechnical data and IT issues (may change in time)
contact_email	E-mail address of the contact person or working group
contact_address	Full address of the contact person or working group

Table 2: Fields of element "gd_sites"

Field Name	Description	Restrictions to values	Unit
latitude	Geographic latitude (+/- for northern/southern hemisphere, respectively)		Decimal degrees
longitude	Geographic longitude from Greenwich (+/- for eastern/western longitude, respectively)		Decimal degrees
Site altitude	Elevation of ground with respect to sea level (+/- for above/below sea level, respectively)		m
Station altitude	Elevation of location of the station with respect to sea level (+/- for above/below sea level, respectively)		m
Building Shelter description	Short description of the location of the station (for example free-field, basement of a two story building, etc)		
country	Country where the site belongs		
morphology_id	Qualitative description of the shape of the earth's surface	Plain Valley - Basin Slope Ridge	
topography_scheme_a_id	Description of the surface according to the Italian Code (detailed description of the scheme in Appendix I).	T1 T2 T3 T4	

Field Name	Description	Restrictions to values	Unit
topography_scheme_b_id	Quantitative description of the shape of the earth's surface according to Burjanek et al, 2014 (detailed description of the scheme in Appendix I).	Valley Lower slope Flat Middle slope Upper slope Ridge	
geological_unit_value	Brief description of the surface geology		
geological_unit_reference	Reference for the information provided in **geological_unit_value**		
geological_map_scale	Scale of geological map used for the description of surface geology provided in **geological_unit_value**		
geological_unit_one_geology_europe	Description of the surface geology according to a Unified, Pan-European Map (to be filled in automatically in the future)		
dominant_frequency_value	Resonance frequency of the soil column at each location/site		Hz
dominant_frequency_method_id	Method by which resonance frequency (**dominant_frequency_value**) has been determined	• HVSR EARTHQUAKE RECORDS • HVSR NOISE • SSR EARTHQUAKE RECORDS • SSR NOISE • INFERRED (GIS/S, ANALYTICAL, NUMERICAL)	
dominant_frequency_reference	Literature or web reference providing detailed information on the methodology adopted for determining the resonance frequency (**dominant_frequency_value**) and detailed analysis		
dominant_frequency_index	Quality Index for the provided resonance frequency (**dominant_frequency_value**) which is derived automatically on the basis of the completeness of information (**dominant_frequency_method_id** and **dominant_frequency_reference**) and grading of the different values of the **dominant_frequency_method_id** database field. Detailed description on the computation of this index is given in Appendix II.		

Field Name	Description	Restrictions to values	Unit
velocity_s30_value	Average shear-wave velocity between 0 and 30 meters depth		m/s
velocity_s30_method_id	Method by which **velocity_s30_value** has been determined	• INFERRED FROM GEOLOGY • INFERRED FROM GEOTECHNICAL MEASUREMENTS: SPT, CPT, LABORATORY • ACTIVE NON-INVASIVE S-WAVE METHODS: S-REFR, S-REFL, SASW, MASW, SWI • PASSIVE NON-INVASIVE S-WAVE METHODS: SPAC / F-K / ReMI • ACTIVE INVASIVE METHODS IN BOREHOLES: CH, DH, UH, P-S LOGGING, SEISMIC CONE, DH STRONG MOTION ARRAYS (INTERFEROMETRY, STRESS-STRAIN ANALYSIS)	
velocity_s30_reference	Literature or web reference providing detailed information on the methodology adopted for determining the **velocity_s30_value**		
velocity_s30_method_comb_index	Index applied for estimating **velocity_s30_index** which carries the information on whether a combination of two methods or more has been applied to estimate the **velocity_s30_value**	• 1.0 if only one method has been used to estimate the **velocity_s30_value** • 1.2 if a combination of two methods or more has been applied to estimate the **velocity_s30_value**	
velocity_s30_manual_index	Overall qualitative factor on the knowledge of the maximum depth of Vs measurements, which is most commonly related to the depth the EC8 engineering bedrock (Vs≥800 m/s). The reasoning for introducing this index and description of its values is provided in Appendix III.	• 0.2 • 0.4 • 0.8 • 1.0	
velocity_s30_index	Quality Index for the provided **velocity_s30_value,** which is derived automatically on the basis of the completeness of information (**velocity_s30_method_id** and **velocity_s30_reference**), the **velocity_s30_method_comb_index**, a grading scheme of the different values of		

Field Name	Description	Restrictions to values	Unit
D7.1	**velocity_s30_method_id** and the **velocity_s30_manual_index**. More information on how this index is computed is given in Appendix IV.		
H_800_value	Depth beyond which the shear-wave velocity Vs exceeds 800 m/s (only if measured).		
ec8_class_value	Ground type according to Eurocode 8 (EC8 § 3.1.2, Table 3.1), based on the **velocity_s30_value** and geotechnical description	• A • B • C • D • S1 • S2 • Undefined	
velocity_profile_ count	Carries the information on whether a velocity profile(s) can be found in EGD or in partners' databases	• 0, if false • Other integer, if true (counter for the number of available profiles at the 2nd level of information)	
borehole_logs_c ount	Carries the information on whether a borehole log profile(s) can be found in EGD or in partners' databases	• 0, if false • Other integer, if true (counter for the number of available profiles at the 2nd level of information)	
spt_logs_count	Carries the information on whether a SPT profile(s) can be found in EGD or in partners' databases	• 0, if false • Other integer, if true (counter for the number of available profiles at the 2nd level of information)	
cpt_logs_count	Carries the information on whether a CPT profile(s) can be found in EGD or in partners' databases	• 0, if false • Other integer, if true (counter for the number of available profiles at the 2nd level of information)	
comment	Other information that the gd_owner considers important for the site and is not included in any of the database fields		

Table 3: Fields of element "instrumentations"

Field Name	Description
network	1 or 2 character code identifying the network/owner of the data. These codes are assigned by the FDSN to provide uniqueness to seismological data (http://ds.iris.edu/ds/nodes/dmc/data/formats/seed/)
station	1 to 5 character identifier for the station recording the data (http://ds.iris.edu/ds/nodes/dmc/data/formats/seed/)
gd_site_id	2 character code used to uniquely identify different data streams at a single station. These IDs are commonly used to logically separate multiple instruments or sensor sets at a single station (http://ds.iris.edu/ds/nodes/dmc/data/formats/seed/). For station sites, it is identical to the "location ID" in the SEED data format.
permanent	A Boolean data type that is true when the site is permanently instrumented and false for non-permanent instrumented sites

Figure 1: Example of manual data entry for 1st Level parameters

1.2   EGD 2nd Level Parameters Description

EGD 2nd Level parameters include detailed, research-oriented information for site characterization. The parameters included in the 2nd Level of EGD are given in Tables 4-11. Figures 2-8 illustrates the manual data entry for the 2nd Level parameters of the EGD web-service.

Table 4: Fields of element "Profiles"

Field Name	Description	Unit
velocity_s_profile	shear wave velocity profile	m/s
velocity_s_profile_method	Method by which **velocity_s_profile** has been determined	
velocity_s_profile_reference	Literature or web reference for **velocity_s_profile**	
velocity_p_profile	compressional wave velocity profile	m/s
velocity_p_profile_method	Method by which **velocity_p_profile** has been determined	
velocity_p_profile_reference	Literature or web reference for **velocity_p_profile**	
qs_profile	shear wave quality factor profile	
qs_profile_method	Method by which **qs_profile** has been determined	
qs_profile_reference	Literature or web reference for **qs_profile**	
qp_profile	compressional wave quality factor profile	
qp_profile_method	Method by which **qp_profile** has been determined	
qp_profile_reference	Literature or web reference for **qp_profile**	

Table 5: Fields of element "Profiles"

Field Name	Description	Unit	Type
publicID:co:	Resource Reference		Text
latitude	Geographic latitude (+/- for northern/southern hemisphere, respectively)	Decimal degrees	5DP

Field Name	Description	Unit	Type
longitude	Geographic longitude from Greenwich (+/- for eastern/western longitude, respectively)	Decimal degrees	5DP
depth	Total drilling depth	m	2DP
bedrockDepth		m	1DP
literatureSource			Text
creationInfo			Text
groundLevel	Elevation of ground with respect to sea level (+/- for above/below sea level, respectively)	m	2DP
groundWaterMeasured	Level of Water Level from ground surface	m	2DP
Investigation Information			Text
originalReference			Text
documents			Text
endDate			D
graphicalLog	YES/NO		Y/N
classificationTests	YES/NO		Y/N
SPTTests	YES/NO		Y/N
strengthTests	YES/NO		Y/N
Status	Draft/Submitted/Review Required/Published		

Table 6: Fields of element "layerGeometry"

Field Name	Unit	Type	Comments
layeTopDepth	m	2DP	quakeML field
layerBottomDepth	m	2DP	quakeML field
description		Text	quakeML field
classification		Text	Extra field

Table 7: Fields of element "ISPT"

Field Name	Description	Unit	Type
LOCA_ID	Borehole Location identifier		
ISPT_TOP	Depth to top of test	m	2DP
ISPT_SEAT	Number of blows for seating drive	m	0DP
ISPT_MAIN	Number of blows for main test drive		0DP
ISPT_NPEN	Total penetration for seating drive and test drive	mm	0DP
ISPT_NVAL	SPT 'N' value		0DP
ISPT_REP	SPT reported result		X
ISPT_CAS	Casing depth at time of test	mm	2DP
ISPT_WAT	Depth to water at time of test	m	XN
ISPT_TYPE	Type of SPT test		PA
ISPT_HAM	Hammer serial number from manufacturer		X
ISPT_ERAT	Energy ratio of the hammer	%	0DP
ISPT_SWP	Self-weight penetration	mm	0DP
ISPT_INC1	Number of blows for 1st Increment (Seating)		0DP
ISPT_INC2	Number of blows for 2nd Increment (Seating)		0DP
ISPT_INC3	Number of blows for 1st Increment (Test)		0DP
ISPT_INC4	Number of blows for 2nd Increment (Test)		0DP
ISPT_INC5	Number of blows for 3rd Increment (Test)		0DP
ISPT_INC6	Number of blows for 4th Increment (Test)		0DP
ISPT_PEN1	Penetration for 1st Increment (Seating Drive)	mm	0DP
ISPT_PEN2	Penetration for 2nd Increment (Seatin Drive)	mm	0DP
ISPT_PEN3	Penetration for 1st Increment (Test)	mm	0DP
ISPT_PEN4	Penetration for 2nd Increment (Test)	mm	0DP
ISPT_PEN5	Penetration for 3rd Increment (Test)	mm	0DP

Field Name	Description	Unit	Type
ISPT_PEN6	Penetration for 4th Increment (Test)	mm	0DP
ISPT_ROCK	SPT carried out in rock		YES/NO
ISPT_REM	Remarks		X
ISPT_ENV	Details of weather and environmental conditions during test		X
ISPT_METH	Test method		X
TEST_STAT	Test status		X
FILE_FSET	Associated file reference (eg test result sheets)		X

Table 8: Fields of element "classificationTests"

Field Name	Description	Unit	Type
LOCA_ID	Borehole Location identifier		ID
SAMP_TOP	Depth to top of sample	m	2DP
SAMP_REF	Sample reference		Text
SAMP_TYPE	Sample type		PA
SAMP_ID	Sample unique global identifier		ID
SPEC_REF	Specimen reference		Text
SPEC_DPTH	Depth to top of test specimen		2DP
SPEC_DESC	Specimen description		Text
LLPL_LL	Liquid limit	%	2SF
LLPL_PL	Plastic limit	%	Number/Text
LLPL_PI	Plasticity Index		2SF
LLPL_425	Percentage passing 425µm sieve	%	2SF
LLPL_REM	Remarks		Text
LLPL_METH	Test method		Text
TEST_STAT	Test status		Text
LNMC_MC	Moisture content	%	2DP

Field Name	Description	Unit	Type
GRAG_UC	Uniformity coefficient D60/D10		1DP
GRAG_VCRE	Percentage of material tested greater than 63mm (cobbles)	%	1DP
GRAG_GRAV	Percentage of material tested in range 63mm to 2mm (gravel)	%	1DP
GRAG_SAND	Percentage of material tested in range 2mm to 63um (sand)	%	1DP
GRAG_SILT	Percentage of material tested in range 63um to 2um (silt)	%	1DP
GRAG_CLAY	Percentage of material tested less than 2um (clay)	%	1DP
GRAG_FINE	Percentage less than 63um	%	1DP
GRAG_REM	Remarks including commentary on effect of specimen disturbance on test result		Text
GRAG_METH	Test method		Text
TEST_STAT	Test status		Text
FILE_FSET	Associated file reference (eg equipment calibrations)		Text

Table 9: Fields of element "StrenghtTests"

Field Name	Description	Unit	Type
LOCA_ID	Borehole Location identifier		ID
SAMP_TOP	Depth to top of sample	m	2DP
SAMP_REF	Sample reference		Text
SAMP_TYPE	Sample type		PA
SAMP_ID	Sample unique global identifier		ID
SPEC_REF	Specimen reference		Text
SPEC_DPTH	Depth to top of test specimen		2DP
SPEC_DESC	Specimen description		Text
TREG_TYPE			PA

Field Name	Description	Unit	Type
TREG_COH	Cohesion intercept	kPa	0DP
TREG_PHI	Angle of friction	deg	1DP
TREG_METH	Test method		Text
TREG_REM	Remarks		Text
SHBG_TYPE	Shear Box Test type		PA
SHBG_PCOH	Peak cohesion intercept	kPa	2SF
SHBG_PHI	Peak angle of friction	deg	1DP
SHBG_RCOH	Residual cohesion intercept	kPa	2SF
SHBG_RPHI	Residual angle of friction	deg	1DP
SHBG_METH	Test method		
TEST_STAT	Test status		Text
FILE_FSET	Associated file reference (eg equipment calibrations)		Text

Table 10: Fields of element "CPT"

Field Name	Description	Unit
latitude	Geographic latitude (+/- for northern/southern hemisphere, respectively)	Decimal degrees (5 decimals)
longitude	Geographic longitude from Greenwich (+/- for eastern/western longitude, respectively)	Decimal degrees (5 decimals)
groundLevel	Elevation of ground with respect to sea level (+/- for above/below sea level, respectively)	m (2 decimals)
InvestigationType	CPT	
PredrillDepth	Depth of predrilling from the ground surface	m (2 decimals)
totalDepth	Depth of CPT test	m (2 decimals)
Ground-level	Elevation of ground with respect to sea level (+/- for above/below sea level, respectively)	
Ground water measured	Level of Water Level from ground surface	

Field Name	Description	Unit
Investigation Information		
Original reference		
endDate		
DrillingCompany		
ConeID		
Supervising Company		
KnownIssue	YES/NO	
Remarks	Description of Issue	
Documents		
GraphicalLog	YES/NO	
RawData	File (CSV, XLS,TXT)	
ReportAnIssue		
Status	Draft/Submitted/Review Required/Published	

Table 11: Fields of element "CPTdata"

Field Name	Description	Unit
layeTopDepth		m (2 decimals)
layeBottomDepth		m (2 decimals)
description		
coneResistanceQc		2 decimals
frictionRatioFs		3 decimals
porePressureU		3 decimals

Figure 2: Manual data entry for 2nd Level parameters: Velocity profiles

Figure 3: Manual data entry for 2nd Level parameters: Quality factor profiles

Figure 4: Manual data entry for 2nd Level parameters: Boreholes

Figure 5: Manual data entry for 2nd Level parameters: SPT tests

Figure 6: Manual data entry for 2nd Level parameters: Classification tests

Figure 7: Manual data entry for 2nd Level parameters: Strength tests

Figure 8: Manual data entry for 2nd Level parameters: CPT tests

Appendix I

In EGD, topography is a <u>precise</u> (quantitative) description of the ground surface features of a site in opposition to morphology, which corresponds to the qualitative (uncountable) description of the ground surface elevation changes. EGD includes two different topographic schemes: Scheme A is the topography description scheme of the Italian Code (Table AI-1), while scheme B is the corresponding scheme that has been suggested by Burjanek et al. (2014) (Table AI-2).

Table AI-1: Topography description scheme of the Italian Code, referred to as "topography_ scheme_a" in EGD.

T1	Flat surface, isolated slopes and cliffs with average slop angle i≤15°
T2	Slopes with average slope angle i>15°
T3	Ridges with crest width significantly less than the base width and average slope angle 15°≤i≤30°
T4	Ridges with crest width significantly less than the base width and average slope angle i>30°

Table AI-2: Topography description scheme proposed by Burjanek et al. (2014), referred to as "topography_scheme_b" in EGD.

Topography	TPI range	Additional metric
Valley	$\leq -\sigma_{TPI}$*	
Lower slope	$-\sigma_{TPI}, -0.5\sigma_{TPI}$	
Flat	$-0.5\sigma_{TPI}, 0.5-\sigma_{TPI}$	Slope≤5°
Middle slope	$-0.5\sigma_{TPI}, 0.5-\sigma_{TPI}$	Slope>5°
Upper slope	$0.5\sigma_{TPI}, \sigma_{TPI}$	
Ridge	$\geq \sigma_{TPI}$	

* σ_{TPI} being the standard deviation of *TPI* (Topography Position Index, i.e., the difference between elevation at a given location and mean elevation of the neighboring area).

Reference:

Burjánek, J., B. Edwards and D. Fäh (2014). Empirical evidence of local seismic effects at sites with pronounced topography: a systematic approach, *Geophys. J. Int.*, **197** (1), 608-619. doi: 10.1093/gji/ggu014

Appendix II

Computation of **dominant_frequency_index**

The **dominant_frequency_index**, QI_{f0}, is automatically calculated in EGD based on **dominant_frequency_method_id** and **dominant_frequency_reference**. Methods frequently adopted toward the estimation of the resonance or dominant frequency, f_0, of a site have been graded with respect to the confidence level of the resulting value of f_0 (Table AII-1). The existence (or not) of an associated reference (web link, journal or other publication) that includes a detailed description of how a specific f_0 value was extracted is also taken into account through factor F2 (Table AII-1). QI_{f0} is finally derived as the sum of the values of F1 and F2.

dominant_frequency_index ALGORITHM: $QI_{f0} = F1 + F2$

Values of QI_{f0} are integers in the range 1-3.

Table AII-1: Values of factors F1 and F2 used in the automatic computation of the value of the EGD field dominant_frequency_index. F1 depends on the method that has been used in the estimation of the dominant frequency, f_0, of a site, while F2 depends on whether a pertinent reference accompanies the f_0 value.

FACTOR	METHOD		GRADING	
F1	HVSR	EARTHQUAKE RECORDS		2
		NOISE		2
	SSR	EARTHQUAKE RECORDS		2
		NOISE	1	
	INFERRED		1	
F2	REFERENCE	Provided	1	
		Not Provided	0	

Appendix III

Description of **velocity_s30_manual_index**

Vs_{30} is a kind of averaging shear wave velocity over the first 30m (where most geotechnical information is often available) and its estimate is affected seriously by the maximum depth of available Vs measurements, most commonly related to the depth of the engineering bedrock (Vs>800m/s). In some cases [e.g., in cases of shallow alluvial deposits (<20m or 10m) overlying very stiff layers classified as "bedrock"], Vs_{30} is estimated with extrapolation of the available Vs profile down to 30m, which leads to erroneous Vs_{30} values. For this reason, EGD includes an overall qualitative factor (F4, Table AIII-1) on the knowledge of the maximum depth of available Vs measurements. The proposed factor is used to "reasonably downgrade" the QI of Vs_{30} values in cases where (a) the knowledge of the stratigraphy of the first 30m is not available (F4=0.2), (b) the maximum depth of available Vs measurements is very shallow (<10m) (F4=0.4), (c) the maximum depth of available Vs measurements is between 10-30m (F4=0.8), and (d) the maximum depth of available Vs measurements is greater than 30m (F4=1).

Table AIII-1: Values of the velocity_s30_manual_index (F3) used in the computation of velocity_s30_index (Appendix IV)

FACTOR		SITE CASES	GRADING
F4	GLOBAL QUALITY	Unknown/partly unknown stratigraphy	0.2
		Maximum depth of Vs measurements <10m	0.4
		Maximum depth of Vs measurements: 10 - 30m	0.8
		Maximum depth of Vs measurements > 30m	1.0

Appendix IV

Computation of **velocity_s30_index**

In EGD, the **velocity_s30_index**, QI_{VS30}, is automatically calculated based on **velocity_s30_ method_id**, **velocity_s30_reference, velocity_s30_method_comb_index** and **velocity_s30_manual_index** (factor F4 in Tables AIII-1 and AIV-1). Most frequent methods for the extraction of S-wave velocity profiles and, thus, of the average shear-wave velocity over the top 30 meters of the soil column, Vs_{30}, have been graded with respect to their reliability (factor F1 in Table AIV-1). In case that one of the above methods is combined and complemented with other well constrained surveying methods to define the average shear-wave velocity over the top 30 meters, a factor F2 equal to 1.2 (Table AIV-1) is applied to the grading of the main method used, with the constraint of F1*F2≤2.5. The existence (or not) of an associated reference (web link, journal or other publication) that includes a detailed description of how a specific Vs_{30} value was extracted is also taken into account through factor F3 (Table AIV-1). QI_{VS30} is finally computed through:

velocity_s30_index ALGORITHM: QI_{VS30}=F4*(F1,2+F3), where F1,2=min{F1*F2, 2.5}

Values of **velocity_s30_index** range between 0.1 and 3.5.

Example computations:

For a Vs_{30} value that is based solely on CH measurements down to a depth of 20m, where the engineering bedrock (Vs=800 m/sec) is met, and with a pertinent reference, F1=2.5, F2=1.0, F3=1.0 and F4=0.8 and thus QI_{VS30} will be equal to 2.8.

For a Vs_{30} value that is based on SPAC measurements, with maximum depth of Vs measurements greater than 30m and with no pertinent reference, F1=2, F2=1.0, F3=0 and F4=1 and, thus, QI_{VS30} will be equal to 2.0.

Table AIV-1: Different values of factors F1, F2, F3 and F4 used in the automatic computation of the velocity_s30_index, a quality index of Vs_{30} values in EGD.

FACTOR	METHOD		GRADING				
F1	INFERRED FROM GEOLOGY		0.5				
	INFERRED FROM GEOTECHNICAL MEASUREMENTS	SPT, CPT		1.0			
		LABORATORY		1.0			
	ACTIVE NON-INVASIVE S-WAVE METHODS	S-REFR			1.5		
		S-REFL				2	
		SASW, MASW, SWI				2	
	PASSIVE NON-INVASIVE S-WAVE METHODS	SPAC / F-K				2	
		ReMi		1.0			
	ACTIVE INVASIVE METHODS (BOREHOLES)	CH					2.5
		DH - UH				2	
		P-S LOG.					2.5
		SEISMIC CONE				2	
		DH STRONG MOTION ARRAYS (INTERFEROMETRY, STRESS-STRAIN ANALYSIS)				2	
F2	COMBINATION OF METHODS	YES	1.2				
		NO	1.0				
F3	REFERENCE	Provided	1.0				
		Not Provided	0.0				
F4	GLOBAL QUALITY	Unknown/partly unknown stratigraphy	0.2				
		Maximum depth of Vs measurements <10m	0.4				
		Maximum depth of Vs measurements: 10 - 30m	0.8				
		Maximum depth of Vs measurements > 30m	1.0				

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