



ITACA 2.0

USER MANUAL

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INTRODUCTION

ITACA 2.0 contains about 7500 processed three-component waveforms generated by about 1200 earthquakes with magnitude greater than 3. Most of the data have been recorded by the National Accelerometric Network (RAN), operated by the Italian Civil Protection Department - Presidency of the Council of Ministers (DPC) and by the National Seismic Network, operated by Istituto Nazionale di Geofisica e Vulcanologia (INGV).

Processed time-series and response spectra and unprocessed time-series are available from the download pages, where the parameters of interest can be set and specific events, stations, waveforms and their metadata can be retrieved.

ITACA 2.0 has been compiled, under the coordination of INGV Milano, in the framework of the agreement between INGV and DPC and the EU Project EPOS (www.epos-eu.org).

Previous versions ("Beta" and 1.0) are the result of two projects (Project S6, 2004-2006, esse6.mi.ingv.it; Project S4, 2007-2009, esse4.mi.ingv.it) funded by the Italian Civil Protection Department. Version 1.1 was developed with the contribution of INGV-DPC Project S2 (2012-2013, sites.google.com/site/ingvdpc2012progettos2/home).

File names

Following the standard of the Seed manual v 2.4 (www.iris.edu), the file names have the following structure:

net_code.station_code.location_code.channel_code.D.date.time.processing_type.waveform_type.format



where:

'net_code' is the international network code (2 characters)

'station_code' is the station code (3 to 5 characters)

'location_code' is the code which indicates whether the station is installed at ground level (empty), or at different ground levels (codes from 01 to 10)

'channel_code' indicates the waveform type and the component and has 3 digits:

- 1) 1 digit for the band code (in our case H = High Broad Band)
- 2) 1 digit to indicate the instrument code: N, L, G = accelerometer (the codes are the ones used by different networks)
- 3) 1 digit to indicate the orientation code: Z N E (Traditional Vertical, North-South, East-West); 1 2 3 Orthogonal components but non-traditional orientations

'date' is the event date as YYYYMMDD

'time' is the event origin time as hhmmss

'processing_type' is either X (unprocessed) or C (processed)

'waveform_type' is either ACC (acceleration) VEL (velocity) DIS (displacement) SA (acceleration spectrum) PSV (pseudo-velocity spectrum) SD (displacement spectrum)

'format' is the file format (.FSEED, .SAC and .ASC for ascii format)

Example: the acceleration recorded by the Department of Civil Protection network (IT) at S. Giuliano di Puglia (SGIUB), NS component, on 2002/11/12 at 09:27:00 GMT, unprocessed, ASCII format with header, will have the following name:

IT.SGIUB..HNN.D.20021112.092700.X.ACC.ASC

ASCII HEADER

The ASCII-with-header records (acceleration, velocity, displacement or response spectra) will be characterised by a header of 55 rows, containing the following information, in order to make the record self-consistent:

1	EVENT_NAME	Name of the seismic event
2	EVENT_ID	Event ID in the database
3	EVENT_DATE_YYYYMMDD	GMT event date (YYYYMMDD)
4	EVENT_TIME_HHMMSS	GMT event origin time (hhmmss)
5	EVENT_LATITUDE_DEGREE	Event Latitude (decimal degrees)
6	EVENT_LONGITUDE_DEGREE	Event Longitude (decimal degrees)
7	EVENT_DEPTH_KM	Event depth (km)



8	HYPOCENTER_REFERENCE	Hypocentral reference
9	MAGNITUDE_W	Moment magnitude (Mw)
10	MAGNITUDE_W_REFERENCE	Moment magnitude reference
11	MAGNITUDE_L	Local magnitude (MI)
12	MAGNITUDE_L_REFERENCE	Local magnitude reference
13	FOCAL_MECHANISM	Focal mechanism (NF, SS, TF, U, etc.)
14	NETWORK	Network code
15	STATION_CODE	Station code
16	STATION_NAME	Station name
17	STATION_LATITUDE_DEGREE	Station Latitude (decimal degrees)
18	STATION_LONGITUDE_DEGREE	Station Longitude (decimal degrees)
19	STATION_ELEVATION_M	Station elevation (m.a.s.l.)
20	LOCATION	Flag indicating the vertical location
21	VS30_M/S	Vs,30 (m/s)
22	SITE_CLASSIFICATION_EC8	Geotechnical classification (EC8): A, A*, B, B*, etc.; where the * indicates that site classification is not based on a direct Vs,30 measurement
23	MORPHOLOGIC_CLASSIFICATION	Morphologic classification
24	EPICENTRAL_DISTANCE_KM	Epicentral distance (km)
25	EARTHQUAKE_BACKAZIMUTH_DEGREE	Earthquake backazimuth (degrees)
26	DATE_TIME_FIRST_SAMPLE_YYYYMMDD_HHMMSS	Time (GMT) of the first sample (YYYYMMDD_hhmmss.dec)
27	DATE_TIME_FIRST_SAMPLE_PRECISION	seconds / milliseconds
28	SAMPLING_INTERVAL_S	Sampling interval (s)
29	NDATA	Number of observations
30	DURATION_S	Duration (s)
31	STREAM	Channel code (3 digits, i.e. HNE)
32	UNITS	Units (cm/s ² , cm/s, cm, cm/s ²)
33	INSTRUMENT	Instrument (sensor and digitizer)
34	INSTRUMENT_ANALOG/DIGITAL	Flag to indicate whether the instrument is digital or analog
35	INSTRUMENTAL_FREQUENCY_HZ	Instrument Frequency (Hz)
36	INSTRUMENTAL_DAMPING	Instrument Damping
37	FULL_SCALE_G	Fullscale (g)
38	N_BIT_DIGITAL_CONVERTER	Number of bits of the Analog to Digital Converter
39	PGX_UNITS	Pga, Pgv, Pgd (cm/s ² , cm/s, cm)
40	TIME_PGX_S	Time corresponding to the Pga, Pgv, Pgd
41	BASELINE_CORRECTION	Flag indicating the baseline correction
42	FILTER_TYPE	Filter type (Butterworth, etc.)
43	FILTER_ORDER	Filter order
44	LOW_CUT_FREQUENCY_HZ	LP1 (low-cut frequency)
45	HIGH_CUT_FREQUENCY_HZ	LP2 (roll-on frequency)
46	LATE/NORMAL_TRIGGERED	LT/NT



47	DATABASE_VERSION	the first string indicates the db version, the second one the header version
48	HEADER_FORMAT	Header type
49	DATA_TYPE	Data type (unprocessed acceleration, processed acceleration, velocity, displacement, acceleration response spectrum) + processing type and version
50	PROCESSING	Processing reference
51	DATA_TIMESTAMP_YYYYMMDD_HHMMSS	Date of file compilation
52	USER1	Free
53	USER2	Free
54	USER3	Free
55	USER4	Free

DATA BASE TABLES

The pseudovelocity and displacement response spectra (5% damping) are now available for download. In order to store the information and reduce the data redundancy, the following tables have been created:

1. *Digitizers* (characteristics of digitizers)
2. *Dispersion_curve* (dispersion curve description for the recording site)
3. *Dispersion_curve_values* (values of the dispersion curve)
4. *Events* (seismic events)
5. *Event_source* (fault geometries)
6. *Fdt* (transfer function description for the recording site)
7. *Fdt_values* (transfer function values)
8. *Log_Cu_layer* (log undrained cohesion)
9. *Log_geotec* (master table of the geotechnical-geophysical data)
10. *Log_nspt_layer* (log standard penetration test)
11. *Log_vs_layer* (log wave velocity)
12. *Magnitude* (magnitude values)
13. *Mag_type* (magnitude type description)
14. *Monography* (images related to the station)
15. *Municipality* (list of the Italian municipality)
16. *Nation* (list of the countries)
17. *Networks* (networks description)
18. *Owners* (record owner description)



19. *Province* (list of the Italian districts)
20. *Reference* (list of references)
21. *Region* (list of the Italian regions)
22. *Response_function* (instrument response function)
23. *Response_function_pole_zero* (list and characteristics of pole and zeros)
24. *Sensor_channel* (description of sensor components)
25. *Station* (recording sites)
26. *Stratigraphy* (master table of the stratigraphy of the recording site)
27. *Stratigraphy_layer* (stratigraphy of the recording site)
28. *Waveform* (synthetic parameters of records)
29. *Waveform_component* (single component characteristics)
30. *d_coordinate_sources* (sources of coordinates)
31. *d_dispersion_curve_method* (description of the methods used to estimate the dispersion curve)
32. *d_EC8* (EC8 classification description)
33. *d_EC8_estimate* (type of estimation of EC8 code)
34. *d_EC8_quality* (quality of the EC8 class estimation)
35. *d_FDT_type* (site transfer function typology)
36. *d_flag_digit* (digitalization type description)
37. *d_fm_method* (focal mechanism determination)
38. *d_fm_type* (type of focal mechanism)
39. *d_generic_digitizer* (characteristics of digitizers)
40. *d_generic_sensor* (characteristics of sensors)
41. *d_housing* (housing of the instrument)
42. *d_instrument_type* (instrument type description)
43. *d_installation* (type of installation)
44. *d_lithography* (description of the lithotechnical units)
45. *d_landslide* (description of landslide)
46. *d_located* (flag indicating located/not located)
47. *d_location* (flag indicating the vertical location of sensors)
48. *d_mag_method* (magnitude calculation description)
49. *d_morph_code* (morphology description)
50. *d_orientation* (sensor orientation description)



51. *d_permanent_flag* (station typology description)
52. *d_pole_type* (pole/zero description)
53. *d_projection* (cartographic projection description)
54. *d_proximity_flag* (proximity to building description)
55. *d_topography* (description of the topographic class)
56. *d_units* (description of the units of measure used)
57. *d_yes_no* (logical fields)

DESCRIPTION OF THE SEISMIC EVENTS

General description

Table name: EVENTS

FIELD	LENG	TYPE	N.DEC	NOTE
ITACA_EVENT_ID	16	Varchar(16)		ITACA unique event ID
EMSC_ID	32	Varchar(32)		EMSC unique event ID
EV_TIME	19	Varchar(19)		YYYY-MM-DD hh:mm:ss date and time of the event (GMT)
EVENT_NAME	100	Varchar(100)		Event name
NATION_CODE	3	Long		UN country code
REGION_CODE	2	Long		Link to table <i>REGION</i>
PROVINCE_CODE	3	Long		Link to table <i>PROVINCE</i>
COMUNE_CODE	6	Long		Link to table <i>MUNICIPALITY</i>
LATITUDE	9	Decimal(9,4)	4	Event latitude in decimal degrees (N of equator)
ERR_LAT	9	Decimal (9,4)	4	Latitude error (in km)
LONGITUDE	9	Decimal (9,4)	4	Event longitude in decimal degrees East of Greenwich meridian
ERR_LON	9	Decimal (9,4)	4	Longitude error (in km)
DEPTH_M	8	Decimal (8,3)	3	Hypocentral depth (km)
ERR_DEPTH	8	Decimal (8,3)	3	Depth error (in km)
HYP_REFERENCE	6	Long		link to table <i>REFERENCE</i>
OTHER_HYPOCENTER		MEMO		Other hypocentral estimation
IO	4	Decimal (4,1)	1	Epicentral intensity
IO_REFERENCE	6	Long		link to table <i>REFERENCE</i>
OTHER_IO		MEMO		Other intensity estimations
FM_METHOD_CODE	5	Varchar(5)		Method for focal mechanism assessment
FM_TYPE_CODE	2	Varchar(2)		Focal mechanism type
FM_REFERENCE	6	Long		link to table <i>REFERENCE</i>
FAULT_FLAG_YESNO_CODE		Long		Flag indicating fault geometry availability 1 = available 0 = not available



STRIKE	6	Decimal(6,1)	1	Angle between the N direction and the projection of the fault surface, measured clockwise
DIP	6	Decimal(6,1)	1	Angle between the fault surface and the horizontal
RAKE	6	Decimal(6,1)	1	Angle of the hanging wall slip-vector measured in the fault plane (between -180 and 180 decimal degrees)
FAULT_REFERENCE	6	Long		Link to table <i>REFERENCE</i>
LOCATED_CODE		Varchar(5)		Flag indicating the location
SURFACE_FLAG_YESNO_CODE	1	Long		Flag of surface faulting 1 = true 0 = false
IDSOURCE	8	Varchar(8)		Link to table <i>EVENT_SOURCE</i>
OTHER_FAULTS		MEMO		Other fault surface assessments

Magnitude

Table name: MAGNITUDE

FIELD	LENG	TYPE	N.DEC	NOTE
ITACA_EVENT_ID	16	Varchar(16)		ITACA unique event ID
MAG_TYPE_CODE	20	Varchar(20)		Link to table <i>MAG_TYPE</i>
MAG_VALUE	4	Decimal(4,1)	1	Magnitude value
ERR_MAG	4	Decimal(4,1)	1	Error in the magnitude determination
METHOD_CODE	16	Varchar(16)		Link to a detailed description of the evaluation method
REFERENCE_CODE	6	Long		Link to table <i>REFERENCE</i>

Table name: MAG_TYPE

FIELD	LENG	TYPE	N.DEC	NOTE
MAG_TYPE_CODE	6	Varchar(6)		Magnitude type
DESCRIPTION	64	Varchar(64)		classical brief definition (e.g. Ml: local magnitude)

Table name: D_MAG_METHOD

FIELD	LENG	TYPE	N.DEC	NOTE
METHOD_CODE	16	Varchar(16)		Magnitude code
DESCRIPTION	64	Varchar(64)		Brief description
LONG_DESCRIPTION		MEMO		Detailed description of the method (if known, includes also the institution)



Focal mechanisms

Table name: *D_FM_TYPE*

FIELD	LENG	TYPE	N.DEC	NOTE
FM_TYPE_CODE	2	Varchar(2)		Focal mechanism code
DESCRIPTION	100	Varchar(100)		Description of the focal mechanism type

Table name: *D_FM_METHOD*

FIELD	LENG	TYPE	N.DEC	NOTE
FM_METHOD_CODE	5	Varchar(5)		Code of the method used for estimating the focal mechanism
DESCRIPTION	100	Varchar(100)		Description of the method used for estimating the focal mechanism

Table name: *EVENT_SOURCE*

FIELD	LENG	TYPE	N.DEC	NOTE
IDSOURCE	8	Varchar(8)		Code of seismic source
LATSL	float			Latitude of the surface trace (left)
LONSL	Float			Longitude of the surface trace (left)
LATSR	Float			Latitude of the surface trace (right)
LONSR	Float			Longitude of the surface trace (right)
LATUL	Float			Latitude of the surface projection (ul corner)
LONUL	Float			Longitude of the surface projection (ul corner)
LATUR	Float			Latitude of the surface projection (ur corner)
LONUR	Float			Longitude of the surface projection (ur corner)
LATLR	Float			Latitude of the surface projection (lr corner)
LONLR	Float			Longitude of the surface projection (lr corner)
LATLL	Float			Latitude of the surface projection (ll corner)



LONLL	float			Longitude of the surface projection (ll corner)
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RECORDING SITE CHARACTERISTICS

General description

Table name: STATION

FIELD	LENG	TYPE	N.DEC	NOTE
STATION_CODE	5	Varchar(5)		Site code
NET_CODE	2	Varchar(2)		Link to table <i>NETWORK</i>
NATION_CODE	3	Varchar(3)		UN country code
COMUNE_CODE	6	Varchar(6)		ISTAT municipality code
PROVINCE_CODE	3	Varchar(3)		ISTAT district code
REGION_CODE	3	Varchar(3)		ISTAT region code
INSTALLATION_CODE	5	Varchar(5)		Link to table <i>D_INSTALLATION_TYPE</i>
EC8_CODE	2	Varchar(2)		Link to table <i>D_EC8</i>
EC8_ESTIMATE_CODE	10	Varchar(10)		Method of EC8 class estimate. Link to table <i>D_EC8_ESTIMATE</i>
EC8_QUALITY_CODE	16	Varchar(16)		EC8 estimation quality
EC8_NOTES	28	Varchar(28)		Notes on EC8
f0	9	Decimal(9,5)		Fundamental frequency
DC_CODE	5	Long		Link to table <i>D_DISPERSION_CURVE</i>
STATION_NAME	100	Varchar(100)		Extended name of the station (generally it coincides with the locality in which the station is installed)
LATITUDE	9	Decimal (9,5)	5	Latitude N from the Equator (decimal degrees)
LONGITUDE	9	Decimal(9,5)	5	Longitude E from the zero meridian (decimal degrees)
COORDINATE_SOURCE_CODE	10	Long		Reference to coordinates
PROJECTION_CODE	10	CHAR(10)		Cartographic projection code
ALTITUDE	6	Long		Elevation (m.a.s.l.)
HORIZ_ERR	6	Long		Expected error on the horizontal coordinates (m)
FOGLIO_100MILA_IGM	64	Varchar(64)		1:100.000 IGM sheet
TAVOLETTA_IGM	16	Varchar(16)		Frame
ORIENTAZIONE_IGM	32	Varchar(32)		Orientation
START_TIME	19	Varchar(19)		Installation date (YYYY-MM-DD hh:mm:ss)
END_TIME	19	Varchar(19)		Removal date (YYYY-MM-DD hh:mm:ss)
ADDRESS	255	Varchar(255)		Site address
PERMANENT_FLAG	1	Long		Purpose of the installation 1



				= permanent 0 = temporary 999 = no information
PROXIMITY_FLAG	1	Long		Flag of proximity to buildings 1 = close to buildings 0 = far from buildings 999 = no information
HOUSING_CODE	10	Varchar(10)		Link to table <i>D_HOUSING</i>
OWNER_CODE	10	Long		Link to table <i>OWNER</i>
FDT_CODE	6	Long		Link to table <i>FDT</i>
MORPH_CODE	2	Varchar(2)		Link to table <i>MORPH_CODE</i>
MORPHOLOGY_NOTES	128	Varchar(128)		Notes on morphology
TOPOGRAPHY_CODE	16	Varchar(16)		Topography class
TOPO_NOTES	128	Notes on topography		
GEOGRAPHICAL_ANNOTATIONS		Long		Notes
GEOGRAPHICAL_MAP_SCALE	64	Varchar(64)		Scale of geographical map
CTR_SHEET	28	Varchar(28)		Regional topographic map
LANDSLIDE_CODE	16	Varchar(16)		Flag indicating the presence of landslides
LANDSLIDE_DISTANCE_KM		Float		Distance from landslide (km)
LANDSLIDE_ANNOTATION		Long		Notes on landslides
GEOLOGICAL_MAP_SCALE	64	Varchar(64)		Scale of geological map
GEOLOGICAL_MAP_SHEET	64	Varchar(64)		Geological sheet number
GEOLOGICAL_MAP_NAME	128	Varchar(128)		Geological map name
GEOLOGICAL_ANNOTATION		Long		Geological notes
LITHO_NOTES	128	Varchar(128)		Notes on lithology
ROCK_MASS_NOTES	128	Varchar(128)		Notes on the rock mass
FAULT_PROXIMITY	64	Varchar(64)		Flag indicating proximity to fault
VS30_M_SEC		Float		Average shear wave velocity over top 30m
VS30_NOTES	128	Varchar(128)		Notes on VS,30
AVERAGE_NSPT_30		Float		Average NSPT over top 30m
NSPT_NOTES	128	Varchar(128)		Notes on NSPT
AVERAGE_CU_30		Float		Average undrained cohesion over top 30 m
CU_NOTES	128	Varchar(128)		Notes on CU
DEPTH_TO_BEDROCK		Float		Depth to bedrock (m)
DEPTH_BEDROCK_NOTES	128	Varchar(128)		Notes on bedrock depth
AVERAGE_VS_BEDROCK_M_SEC		Float		Average shear wave velocity to bedrock
VS_BEDROCK_NOTES	128	Varchar(128)		Notes on velocity to bedrock
F0_HV_MICRTOTREMORS_HZ		Float		Fundamental frequency from HVSR of microtremors
F0_MICRTOTREMORS_NOTES	128	Varchar(128)		Notes
F1_HV_MICRTOTREMORS_HZ		Float		Other frequency from HVSR of microtremors
F0_HV_EARTHQUAKES_HZ		Float		Fundamental frequency from HVSR of earthquake records
F0_EARTHQUAKES_NOTE	128	Varchar(128)		Notes
F1_HV_EARTHQUAKES_HZ		Float		Other frequency from HVSR of earthquake records



SITE_RESPONSE	128	Varchar(128)		
SITE_RESPONSE_NOTES	128	Varchar(128)		Notes
SUMMARY_ANNOTATIONS		Long		Notes
GENERAL_ANNOTATIONS		Long		Notes
LOCATION_REFERENCE_CODE	6	Long		Link to table <i>REFERENCE</i>

Table name: MONOGRAPHY

FIELD	LENG	TYPE	N.DEC	NOTE
STATION_CODE	5	Varchar(5)		Site code
NET_CODE	2	Varchar(2)		Link to table <i>NETWORK</i>
STATION_PHOTO_NAME	128	Varchar(128)		
STATION_PHOTO		Longblob		
GEOGRAPHICAL_MAP_NAME	128	Varchar(128)		
GEOGRAPHICAL_MAP_IMAGE		Longblob		
LOCATION_MAP_NAME	128	Varchar(128)		
LOCATION_MAP_IMAGE		Longblob		
LANDSLIDE_MAP_IMAGE_NAME	128	Varchar(128)		
LANDSLIDE_MAP_IMAGE_IMAGE		Longblob		
GEOLOGICAL_MAP_NAME	128	Varchar(128)		
GEOLOGICAL_MAP_IMAGE		Longblob		
GEOLOGICAL_CROSS_SECTION_IMAGE_NAME	128	Varchar(128)		
GEOLOGICAL_CROSS_SECTION_IMAGE_IMAGE		Longblob		
GEOTECHNICAL_INFO_PDF_NAME	128	Varchar(128)		
GEOTECHNICAL_INFO_PDF		Longblob		
FINAL_PDF_NAME	128	Varchar(128)		
FINAL_PDF		Longblob		
MICROTREMORS_IMAGE		Longblob		
MICROTREMORS_IMAGE_NAME	128	Varchar(128)		
COMPLETE_MONOGRAPHY		Longblob		
COMPLETE_MONOGRAPHY_NAME	128	Varchar(128)		

Networks

Table name: NETWORKS

FIELD	LENG	TYPE	N.DEC	NOTE
NET_CODE	2	Varchar(2)		Univocal Network code
NET_NAME	50	Varchar(50)		Network name
OWNER_CODE	10	Long		Link to table <i>OWNER</i>
START_TIME	19	Varchar(19)		Date of opening of the Network (YYYY-MM-DD hh:mm:ss)
END_TIME	19	Varchar(19)		Date of closing of the Network (YYYY-MM-DD hh:mm:ss)
MIN_LAT	9	Decimal(9,5)	5	Minimum latitude covered by the net
MAX_LAT	9	Decimal(9,5)	5	Maximum latitude covered by the net



MIN_LON	9	Decimal(9,5)	5	Minimum longitude covered by the net
MAX_LON	9	Decimal(9,5)	5	Maximum longitude covered by the net

Installation typology

Table name: D_INSTALLATION

FIELD	LENG	TYPE	N.DEC	NOTE
INSTALLATION_CODE	5	Varchar(5)		Installation type code
DESCRIPTION	255	Varchar(255)		Description of the installation type

It contains the information on the installation type. Typical record will be: pillar, floor of the structure, directly on the ground, etc.

Table name: D_HOUSING

FIELD	LENG	TYPE	N.DEC	NOTE
HOUSING_CODE	10	Varchar(10)		Housing Code
DESCRIPTION	255	Varchar(255)		Housing description

It contains the information on the housing type. Typical record will be: dam, building, bridge, BOX, ENEL BOX, Historical building, Cave, etc.

Soil class description according to the European code (EC8)

Table name: D_EC8

FIELD	LENG	TYPE	N.DEC	NOTE
EC8_CODE	2	Varchar(2)		EC8 code
EC8_DESC	255	Varchar(255)		Soil description

EC8 soil classes:

A = Rock or other rock-like geological formation, including at most 5 m of weaker material at the surface ($V_{s,30} > 800$ m/s)

B = Deposits of very dense sand, gravel, or very stiff clay, at least several tens of m in thickness, characterised by a gradual increase of mechanical properties with depth ($V_{s,30} = 360 - 800$ m/s; NSPT > 50; $c_u > 250$ kPa)

C = Deep deposits of dense or medium dense sand, gravel or stiff clay with



thickness from several tens to many hundreds of m ($V_{s,30} = 180 - 360$ m/s; NSPT = 15 – 50; $c_u = 70 - 250$ kPa)

D = Deposits of loose-to-medium cohesionless soil (with or without some soft cohesive layers), or of predominantly soft-to-firm cohesive soil ($V_{s,30} < 180$; NSPT < 15; $c_u < 70$ kPa)

E = A soil profile consisting of a surface alluvium layer with V_s values of type C or D and thickness varying between about 5m and 20m, underlain by stiffer material with ($V_s > 800$ m/s)

S1 = Deposits consisting – or containing a layer at least 10m thick – of soft clays/silts with high plasticity index ($PI > 40$) and high water content ($V_{s,30} < 100$; $c_u = 10 - 20$ kPa)

S2 = Deposits of liquefiable soils, of sensitive clays, or any other soil profile not included in types A – E or S1

NOTE: the * after the EC8 code indicates that site classification is not based on a direct $V_{s,30}$ measurement

Table name: D_EC8_ESTIMATE

FIELD	LENG	TYPE	N.DEC	NOTE
EC8_ESTIMATE_CODE	10	Varchar(10)		EC8 estimation code
EC8_ESTIMATE_DESC	255	Varchar(255)		Description of the method used to assign EC8 code

It contains the information on the method used to assign EC8 code. Typical measurements will be: (from) cross-hole, down-hole, SASW, REMI, stratigraphy (* after the code), etc.

Table name: D_EC8_QUALITY

FIELD	LENG	TYPE	N.DEC	NOTE
EC8_QUALITY_CODE	16	Varchar(16)		EC8 estimation code
DESCRIPTION	128	Varchar(128)		Description of the method used to assign EC8 code

Morphology description

Table name: D_MORPH_CODE

FIELD	LENG	TYPE	N.DEC	NOTE
MORPH_CODE	2	Varchar(2)		Morphology Code



DESCRIPTION	255	Varchar(255)		Morphology description
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Ex.: *C* = crest; *P* = slope; *V* = valley; *VE* = peak; *SE* = saddle; *PI* = plain

Table Name: *D_LANDSLIDE*

FIELD	LENG	TYPE	N.DEC	NOTE
LANDSLIDE_CODE	16	Varchar(16)		Unit ID
DESCRIPTION	128	Varchar(128)		Description

ACTIVE = Close to active landslide

INACTIVE = Close to inactive landslide

NO = No landslide

Table Name: *D_TOPOGRAPHY*

FIELD	LENG	TYPE	N.DEC	NOTE
TOPOGRAPHY_CODE	16	Varchar(16)		Unit ID
DESCRIPTION	128	Varchar(128)		Description

T1 Flat surface, isolated slopes and cliffs with average slope angle $i \leq 15^\circ$

T2 Slopes with average slope angle $i > 15^\circ$

T3 Ridges with crest width significantly less than the base width and average slope angle $15^\circ \leq i \leq 30^\circ$

T4 Ridges with crest width significantly less than the base width and average slope angle $i > 30^\circ$

Site stratigraphy

Table name: STRATIGRAPHY

FIELD	LENG	TYPE	N.DEC	NOTE
NET_CODE	2	Varchar(2)		Link to table NETWORKS
STATION_CODE	5	Varchar(5)		Link to table STATION
STRATIGRAPHY_CODE	6	Long		Stratigraphy code
LATITUDE	9	Decimal(9,5)	5	Latitude of the survey point
LONGITUDE	9	Decimal(9,5)	5	Longitude of the survey point
PROJECTION_CODE	10	Varchar(10)		Cartographic projection code
ELEVATION	6	Decimal(6,1)	1	Elevation of the reference point (m.a.s.l.)
REFERENCE_CODE	6	Long		Link to table REFERENCE



Table name: STRATIGRAPHY_LAYER

FIELD	LENG	TYPE	N.DEC	NOTE
STRATIGRAPHY_CODE	6	Long		Link to table <i>STRATIGRAPHY</i>
NET_CODE	2	Varchar(2)		Univocal Network code
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
LITHOGRAPHY_CODE	5	Varchar(5)		Link to table <i>LITOGRAPHY</i>
SEQUENCE NUMBER	3	Long		Progressive number of the layer
TOP	6	Decimal(6,1)	1	Top of the layer (meters from the ground level)
BOTTOM	6	Decimal(6,1)	1	Base of the layer (meters from the ground level)
DESCRIPTION	255	Varchar(255)		Layer description

Table name: D_LITHOGRAPHY

FIELD	LENG	TYPE	N.DEC	NOTE
LITHOGRAPHY_CODE	5	Varchar(5)		Code of the lithography class
DESCRIPTION	255	Varchar(255)		Description of the lithography class

Velocity profile and geotechnical parameters

Table name: LOG_GEOTEC

FIELD	LENG	TYPE	N.DEC	NOTE
NET_CODE	2	Long		Network code
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
LOG_GEOTEC_CODE	6	Long		Geotechnical log code
LATITUDE	9	Decimal(9,5)	5	Latitude of the survey point
LONGITUDE	9	Decimal(9,5)	5	Longitude of the survey point
PROJECTION_CODE	10	Varchar(10)		Cartographic projection code
ELEVATION	9	Decimal(9,5)	5	Elevation of the reference point (m.a.s.l.)
REFERENCE_CODE	6	Long		Link to table <i>REFERENCE</i>

Table name: LOG_VS_LAYER

FIELD	LENG	TYPE	N.DEC	NOTE
LOG_VS_LAYER_CODE	6	Long		Log code
LOG_GEOTEC_CODE	6	Long		Link to table <i>LOG_GEOTEC</i>
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
NET_CODE	2	Varchar(2)		Network code
TOP	6	Decimal(6,1)	1	Upper bound (meters from the ground level)
BOTTOM	6	Decimal(6,1)	1	Lower bound (meters from the ground level)
VS	6	Decimal(6,2)	2	Shear-wave velocity value (m/s)
VP	6	Decimal(6,2)	2	Longitudinal-wave velocity value (m/s)



Table name: LOG_NSPT_LAYER

FIELD	LENG	TYPE	N.DEC	NOTE
LOG_NSPT_LAYER_CODE	6	Long		Log code
LOG_GEOTEC_CODE	6	Long		Link to table <i>LOG_GEOTEC</i>
NET_CODE	2	Varchar(2)		Network code
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
TOP	6	Decimal(6,1)	1	Upper bound (meters from the ground level)
BOTTOM	6	Decimal(6,1)	1	Lower bound (meters from the ground level)
NSPT	4	Long		NSPT value

Table name: LOG_Cu_LAYER

FIELD	LENG	TYPE	N.DEC	NOTE
LOG_CU_LAYER_CODE	6	Long		Univocal Log code
LOG_GEOTEC_CODE	6	Long		Link to table <i>LOG_GEOTEC</i>
NET_CODE	2	Varchar(2)		Network code
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
TOP	6	Decimal(6,1)	1	Upper bound (meters from the ground level)
BOTTOM	6	Decimal(6,1)	1	Lower bound (meters from the ground level)
Cu	6	Decimal(6,1)		Cohesion (undrained shear strength) value (kPa)

Site transfer function

Table name: FDT

FIELD	LENG	TYPE	N.DEC	NOTE
NET_CODE	2	Varchar(2)		Network code
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
FDT_TYPE_CODE	7	Varchar(7)		Link to table <i>FDT_TYPE</i>
REFERENCE_CODE	6	Long		Link to table <i>REFERENCE</i>

Table name: FDT_VALUES

FIELD	LENG	TYPE	N.DEC	NOTE
NET_CODE	2	Varchar(2)		Network code
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
FDT_TYPE_CODE	7	Varchar(7)		Link to table <i>FDT_TYPE</i>
FDT_SEQUENCE	5	I		
FREQ	6	Decimal (6,1)	1	Frequency
AMPLITUDE	6	Decimal (6,1)	1	Transfer function amplitude
STD	6	Decimal (6,1)	1	Standard deviation



Table name: D_FDT_TYPE

FIELD	LENG	TYPE	N.DEC	NOTE
FDT_TYPE_CODE	7	Varchar(7)		Type of FDT determination: <i>GIT</i> = generalized inversion <i>NHVSR</i> = H/V from microtremors <i>SMHVSR</i> = H/V from strong motions <i>WMHVSR</i> = H/V from weak motions <i>WMSSR</i> = standard spectral ratio from weak motion <i>SMSSR</i> = standard spectral ratio from strong motion <i>1DMOD</i> = 1D model <i>2DMOD</i> = 2D model
DESCRIPTION		MEMO		Description of the method

Dispersion curve

Table name: DISPERSION_CURVE

FIELD	LENG	TYPE	N.DEC	NOTE
DC_CODE	6	Long		Univocal dispersion curve code
NET_CODE	2	Varchar(2)		Network code
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
DC_METHOD_CODE	5	Varchar(5)		Link to table <i>DC_METHOD</i>
REFERENCE	6	Long		Link to table <i>REFERENCE</i>

Table name: DISPERSION_CURVE_VALUES

FIELD	LENG	TYPE	N.DEC	NOTE
DC_CODE	6	Long		Univocal dispersion curve code
NET_CODE	2	Varchar(2)		Network code
STATION_CODE	5	Varchar(5)		Link to table <i>STATION</i>
DISPERSION_CURVE_SEQUENCE				
FREQ	6	Decimal (6,1)	1	Frequency
PHASE_VEL	6	Decimal (6,1)	1	Phase velocity

Table name: D_DISPERSION_CURVE_METHOD

FIELD	LENG	TYPE	N.DEC	NOTE
DC_METHOD_CODE	5	Varchar(5)		Code of the method used for the determination of the dispersion curve
DESCRIPTION	255	Varchar(255)		Description



SPAC = Spatial autocorrelation

F_K = Frequency-wavenumber

Dictionary tables

Table name: D_PERMANENT_FLAG

FIELD	LENG	TYPE	N.DEC	NOTE
PERMANENT_FLAG	5	Long		Code of the installation type
DESCRIPTION	255	Varchar(255)		Description

Table name: D_PROXIMITY_FLAG

FIELD	LENG	TYPE	N.DEC	NOTE
PROXIMITY_FLAG	5	Long		Code of the type of proximity to buildings
DESCRIPTION	255	Varchar(255)		Description

INSTRUMENT DESCRIPTION

General description

Table name: SENSOR_CHANNEL

FIELD	TYPE	N.DEC	NOTE
NET_CODE	Varchar(2)		Link to table NETWORK
STATION_CODE	Varchar(5)		Link to table STATION
SENSOR_SERIAL_NUMBER	Varchar(50)		Sensor serial number
SENSOR_MODEL_CODE	Varchar(50)		Sensor model
SENSOR_INSTALLATION_START_TIME	Varchar(19)		Installation date (YYYY-MM-DD hh:mm:ss)
SENSOR_INSTALLATION_END_TIME	Varchar(19)		Removal date (YYYY-MM-DD hh:mm:ss)
ORIENTATION_CODE	Varchar(2)		Link to D_ORIENTATION
LOCATION_CODE	Varchar(2)		
INCLINATION	Double(9,1)	1	Degrees from horizontal
AZIMUTH	Double(9,1)	1	Degrees from the North
FREQUENCY	Double(9,2)	2	Sensor natural frequency (Hz)
SENSOR_DEPTH	Double(9,1)	1	Sensor depth below ground surface (m)
DAMPING	Double(5,2)	2	Damping
FULLSCALE	Double(5,2)	2	Full scale (g)
SENSITIVITY	Double(9,6)	6	Sensitivity
SENSITIVITY_UNIT	Int(11)		Sensitivity units



Table name: DIGITIZER

FIELD	TYPE	N.DEC	NOTE
NET_CODE	Varchar(2)		Link to table <i>NETWORK</i>
STATION_CODE	Varchar(5)		Link to table <i>STATION</i>
DIGITIZER_SERIAL_NUMBER	Varchar(50)		Digitizer serial number
DIGITIZER_MODEL_CODE	Varchar(50)		Digitizer model
DIGITIZER_INSTALLATION_START_TIME	Varchar(19)		Installation date (YYYY-MM-DD hh:mm:ss)
DIGITIZER_INSTALLATION_END_TIME	Varchar(19)		Removal date (YYYY-MM-DD hh:mm:ss)
SAMPLES_PER_SECOND	Double(9,6)		Number of samples per second
GAIN	Double(9,6)		Digitizer gain
NUMBER_BITS_ADC	Int(11)		Number of bits ADC
INSTRUMENT_TYPE_CODE	Varchar(8)		Digital/Analog

Table name: RESPONSE_FUNCTION

FIELD	TYPE	N.DEC	NOTE
NET_CODE	Varchar(2)		Link to table <i>NETWORK</i>
STATION_CODE	Varchar(5)		Link to table <i>STATION</i>
SENSOR_INSTALLATION_START_TIME	Varchar(19)		Installation date (YYYY-MM-DD hh:mm:ss)
DIGITIZER_INSTALLATION_START_TIME	Varchar(19)		Installation date (YYYY-MM-DD hh:mm:ss)
ORIENTATION_CODE	Varchar(2)		Link to <i>D_ORIENTATION</i>
LOCATION_CODE	Varchar(2)		
UNITS_CODE_INPUT	Integer		Link to table <i>d_UNITS</i>
UNITS_CODE_OUTPUT	Integer		Link to table <i>d_UNITS</i>

Table name: RESPONSE_FUNCTION_POLE_ZERO

FIELD	TYPE	N.DEC	NOTE
NET_CODE	Varchar(2)		Link to table <i>NETWORK</i>
STATION_CODE	Varchar(5)		Link to table <i>STATION</i>
SENSOR_INSTALLATION_START_TIME	Varchar(19)		Installation date (YYYY-MM-DD hh:mm:ss)
DIGITIZER_INSTALLATION_START_TIME	Varchar(19)		Installation date (YYYY-MM-DD hh:mm:ss)
ORIENTATION_CODE	Varchar(2)		Link to <i>D_ORIENTATION</i>
LOCATION_CODE	Varchar(2)		
POLE_TYPE_CODE	Varchar(8)		P/Z/C
POLE_ZERO_ORDER	Integer		
REAL_PART	Double		
IMAGINARY_PART	Double		

Dictionary tables



Table name: D_GENERIC_DIGITIZER

FIELD	TYPE	N.DEC	NOTE
DIGITIZER_MODEL_CODE	Varchar(3)		Model ID
MANUFACTURER_CODE	Varchar(50)		Sensor manufacturer
DIGITIZER_MODEL	Varchar(50)		Digitizer model

Table name: D_GENERIC_SENSOR

FIELD	TYPE	N.DEC	NOTE
SENSOR_MODEL_CODE	Varchar(3)		Model ID
MANUFACTURER_CODE	Varchar(50)		MANUFACTURER_CODE
SENSOR_MODEL	Varchar(50)		Sensor model

Table name: D_ORIENTATION

FIELD	TYPE	N.DEC	NOTE
ORIENTATION_CODE	Varchar(4)		Orientation code
DESCRIPTION	Varchar(16)		Orientation description

Table name: D_LOCATION

FIELD	TYPE	N.DEC	NOTE
LOCATION_CODE	Varchar(2)		Location_code (00 = surface)
DESCRIPTION	Varchar(16)		Location description

Dictionary tables

Table name: D_INSTRUMENT_TYPE

FIELD	LENG	TYPE	N.DEC	NOTE
INSTRUMENT_TYPE_CODE	8	Varchar(8)		Instrument type code
DESCRIPTION	255	Varchar(255)		Description of the instrument type (A/D)

Table name: D_ORIENTATION

FIELD	LENG	TYPE	N.DEC	NOTE
ORIENTATION_CODE	2	Varchar(2)		Orientation code
DESCRIPTION	255	Varchar(255)		Orientation description



Table name: D_POLE_TYPE

FIELD	LENG	TYPE	N.DEC	NOTE
POLE_TYPE_CODE	2	Varchar(2)		Code
DESCRIPTION	255	Varchar(255)		Pole /Zero

INFORMATION ON THE INSTITUTIONS MANAGING NETWORKS, STATIONS OR DATA BASES

Table name: OWNERS

FIELD	LENG	TYPE	N.DEC	NOTE
OWNER_CODE	6	Long		Univocal code
SHORT_CODE	5	Varchar(5)		Code of max 5 characters, abbreviation of the complete name
DESCRIPTION	255	Varchar(255)		Long description
INFO	255	Varchar(255)		Information on the Agency
PHONE	50	Varchar(50)		Telephone number
CONTACT	255	Varchar(255)		Referring information

RECORDING CHARACTERISTICS

Characteristics of the unprocessed and processed recordings

Table Name: WAVEFORM

FIELD	LENG	TYPE	N.DEC	NOTE
NET_CODE	2	Varchar(2)		Network code
STATION_CODE	6	Varchar(5)		Link to table <i>STATION</i>
ITACA_EVENT_ID	16	Varchar(16)		Event unique ID
INSTRUMENT_TYPE_CODE	8	Varchar(8)		Analog / Digital
FILTYPE	15	Varchar(15)		Filter type
FLAG_DIGIT	3	Varchar(3)		Digitalization Flag A = automatic M = manual A/M = automatic/manual



PGA_MAX		Float		Maximum processed acceleration among 3 components
PGV_MAX		Float		Maximum velocity among 3 components
PGD_WE		Float		Maximum displacement among 3 components
UNCORRECTED_PGA_MAX		Float		Maximum unprocessed acceleration among 3 components
CORRECTED_HORIZONTAL_PGA_MAX		Float		Maximum processed horizontal acceleration
CORRECTED_VERTICAL_PGA		Float		Processed vertical acceleration
INTENSITY_MAX		Float		Maximum Arias intensity among 3 components
HOUSNER_MAX		Float		Epicentre-station distance in km
DURATION_MAX		Float		Maximum duration among 3 components
EPI_AZ		Float		Epicentre-station azimuth, clockwise from the N
FAULT_DIST		Float		Joyner-Boore distance (distance from the station to the fault projection) in km
LATE_TRIGGERED_EVENT_01		char(1)		Flag to indicate late triggered records

Table Name: WAVEFORM COMPONENT

FIELD	LENG	TYPE	N.DEC	NOTE
NET_CODE	2	Varchar(2)		Network code
STATION_CODE	6	Varchar(5)		Link to table <i>STATION</i>
ITACA_EVENT_ID	16	Varchar(16)		Event unique ID
SENSOR_INSTALLATION_START_TIME	19	Varchar(19)		Link to table <i>SENSOR_CHANNEL</i>
DIGITIZER_INSTALLATION_START_TIME	19	Varchar(19)		Link to table <i>DIGITIZER</i>
LOCATION_CODE	16	Varchar(16)		
ORIENTATION_CODE	16	Varchar(16)		
CORRECTED_NPT		Float		Number of samples of processed record
CORRECTED_DT		Float		Sampling of processed record (s)
UNITS	10	Varchar(10)		
HP		Double		High-cut frequency
LP		Double		Low-cut frequency
PGA		Double		Peak ground acceleration of the processed signal
PGV		Double		Peak ground velocity of the processed signal
PGD		Double		Peak ground



				displacement of the processed signal
DUR		Double		90% duration of the processed signal
IA				Arias intensity of the processed signal
HOUSNER				Housner intensity of the processed signal
PGA_TIME		Double		Time of the peak ground acceleration
UNCORRECTED_NPT		Int(11)		Number of points of uncorrected signal
UNCORRECTED_PGA		Double		Peak ground acceleration of the unprocessed signal
UNCORRECTED_PGA_TIME		Double		Time of the peak ground acceleration of the unprocessed signal
UNCORRECTED_DT		Double		Sampling rate of the unprocessed signal (s)

Data dictionary

Table Name: D_FLAG_DIGIT

FIELD	LENG	TYPE	N.DEC	NOTE
FLAG_DIGIT_CODE	3	Varchar(3)		Digitalization code
DESCRIPTION	100	Varchar(100)		Description

ADDITIONAL DATA DICTIONARIES

References

Table Name: REFERENCE

FIELD	LENG	TYPE	N.DEC	NOTE
REFERENCE_CODE	6	Long		Univocal self-incremental code
TITOLO		MEMO		Description of the reference
REF_ABBR	255	Varchar(255)		Brief reference description

Administrative data

Table Name: NATION



FIELD	LENG	TYPE	N.DEC	NOTE
NATION_CODE	3	Varchar(3)		UN country code
NATION_NAME	100	Varchar(100)		Country name

Table Name: MUNICIPALITY

FIELD	LENG	TYPE	N.DEC	NOTE
NATION_CODE	3	Varchar(3)		UN country code
REGION_CODE	2	Varchar(2)		ISTAT region code
PROVINCE_CODE	3	Varchar(3)		ISTAT district code
COMUNE_CODE	6	Varchar(6)		ISTAT municipality code
COMUNE_NAME	100	Varchar(100)		Municipality name
LATITUDE	9	Decimal(9,5)	5	Latitude of the municipality centroid
LONGITUDE	9	Decimal(9,5)	5	Longitude of the municipality centroid
PEOPLE	8	Long		Number of inhabitants

Table Name: PROVINCE

FIELD	LENG	TYPE	N.DEC	NOTE
NATION_CODE	3	Varchar(3)		UN country code
REGION_CODE	2	Varchar(2)		ISTAT region code
PROVINCE_CODE	3	Varchar(3)		ISTAT district code
PROVINCE_ABBR	2	Varchar(2)		District code
PROVINCE_NAME	50	Varchar(50)		District name

Table Name: REGION

FIELD	LENG	TYPE	N.DEC	NOTE
NATION_CODE	3	Varchar(3)		UN country code
REGION_CODE	2	Varchar(2)		ISTAT region code
REGION_NAME	50	Varchar(50)		Region name

Cartographic projections

Table Name: D_PROJECTION

FIELD	LENG	TYPE	N.DEC	NOTE
PROJECTION_CODE	10	Varchar(10)		Projection code
DESCRIPTION	100	Varchar(100)		Projection description



Coordinates

Table Name: *D_COORDINATE_SOURCE*

FIELD	LENG	TYPE	N.DEC	NOTE
COORDINATE_SOURCE_CODE	1	Varchar(1)		Coordinate source code
DESCRIPTION	100	Varchar(100)		Description

Event location

Table Name: *D_LOCATED*

FIELD	LENG	TYPE	N.DEC	NOTE
LOCATED_CODE	1	Varchar(1)		Location code
DESCRIPTION	100	Varchar(100)		Description

Sensitivity units

Table Name: *D_UNITS*

FIELD	LENG	TYPE	N.DEC	NOTE
UNITS_CODE	1	Varchar(1)		Unit ID
DESCRIPTION	100	Varchar(100)		Description

Last update: March 2014