Direzione Progettazione e Realizzazione Lavori

SS.4 - Variante dell'abitato di Monterotondo Scalo - 2°Stralcio

PROGETTO DEFINITIVO

COD. RM190

PROGETTAZIONE: ATI SINTAGMA - GDG - ICARIA

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Ordine degli Ingegneri della Prov. di Perugia n° A351

IL PROGETTISTA:
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IL GEOLOGO:
Dott. Geol. Giorgio Cerquiglini
Ordine dei Geologi della Regione Umbria n°108

Il R.U.P.
Dott. Ing.
Achille Devitofranceschi

IL COORDINATORE PER LA SICUREZZA IN FASE DI PROGETTAZIONE:
Dott. Ing. Filippo Pambianco
Ordine degli Ingegneri della Prov. di Perugia n° A1373

PROTOCOLLO	DATA

IL GRUPPO DI PROGETTAZIONE:

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Dott. Ing.	F.Aloe	Geom.	C.Vischini
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Dott. Ing.	C.Consorti	Dott. Ing.	G.Pulli
Geom.	M.Manzo	Geom.	C.Sugaroni

ORDINE DEGLI INGEGNERI DELLA PROVINCIA DI PERUGIA
Sezione A
DOTTORE INGEGNERE
NANDO GRANIERI
SETTORE CIVILE E AMBIENTALE
SETTORE INDUSTRIALE
SETTORE DELL'INFORMAZIONE

ORDINE DEGLI INGEGNERI DELLA PROVINCIA DI PERUGIA
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N° A3217
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SETTORE CIVILE E AMBIENTALE

ELABORATI GENERALI
INQUADRAMENTO DELL'OPERA
Relazione sui rilievi planoaltimetrici

CODICE PROGETTO			NOME FILE	REVISIONE	SCALA:
PROGETTO	LIV. PROG.	N. PROG.	T00-EG00-GEN-RE02-A		
DPRM0190	D	20	CODICE ELAB. T00EG00GENRE02	A	-

REV.	DESCRIZIONE	DATA	REDATTO	VERIFICATO	APPROVATO
A	Emissione	17/01/2021	L. Gagliardini	E.Bartolocci	N.Granieri

Oggetto: **Rilievo aerofotogrammetrico e integrazione rilievo celerimetrico finalizzato alla progettazione definitiva/esecutiva del nuovo tratto di - SS4 Variante di Monterotondo Scalo – 2° Stralcio – ROMA 190**

RELAZIONE TECNICO-DESCRITTIVA

1. RETE DI CAPISALDI DI NUOVA ISTITUZIONE

La rete geodetica GNSS utilizzata per la determinazione delle coordinate dei n.9 capisaldi di nuova istituzione è costituita da (*Fig.1 e All.1)*:

1. n.3 stazioni permanenti facenti parte della rete Italpos di Leica Geosystems: MORO, MOSE e OLGI (*Fig.2a-2b-2c)*;
2. n.2 vertici della rete IGM95: 144903 (corredato del relativo grigliato IGMI GK2) e 150904;
3. n.2 capisaldi di livellazione ABT-024 (CV-non stazionabile) e ABT-025 (CO-stazionabile). I presenti capisaldi sono stati impiegati per la verifica della congruenza altimetrica della rete di capisaldi di nuova istituzione con la rete altimetrica di alta precisione nazionale;
4. n.9 capisaldi di nuova istituzione (CS1-CS2-CS3-CS4-CS5-CS6-CS7-CS8-CS9).

Le misure GNSS sono state eseguite in modalità statica in data 10.05.2019 facendo uso della seguente strumentazione: n.2 strumenti GPS Leica 1230 e n.1 strumento GNSS Leica GS18.
I dati dalle stazioni MORO, MOSE e OLGI sono stati acquisiti dal servizio Italpos di Hexagon in formato RINEX con campionamento 5" per tutta la durata giornaliera della campagna di misura.
Tutti i dati satellitari raccolti sono stati elaborati con software Leica GeoOffice di Leica Geosystems.
Nell'esecuzione delle misure sono stati rispettati i seguenti parametri: tempo minimo di stazionamento 45', intervallo di campionamento 5", cut off 15 gradi e numero di satelliti mai inferiore a 7.
I tabulati di calcolo completi delle singole baseline vengono riportati in "All. 2 - baseline processing" mentre il risultato della compensazione della rete è riportata in "All.3 - adjustment".

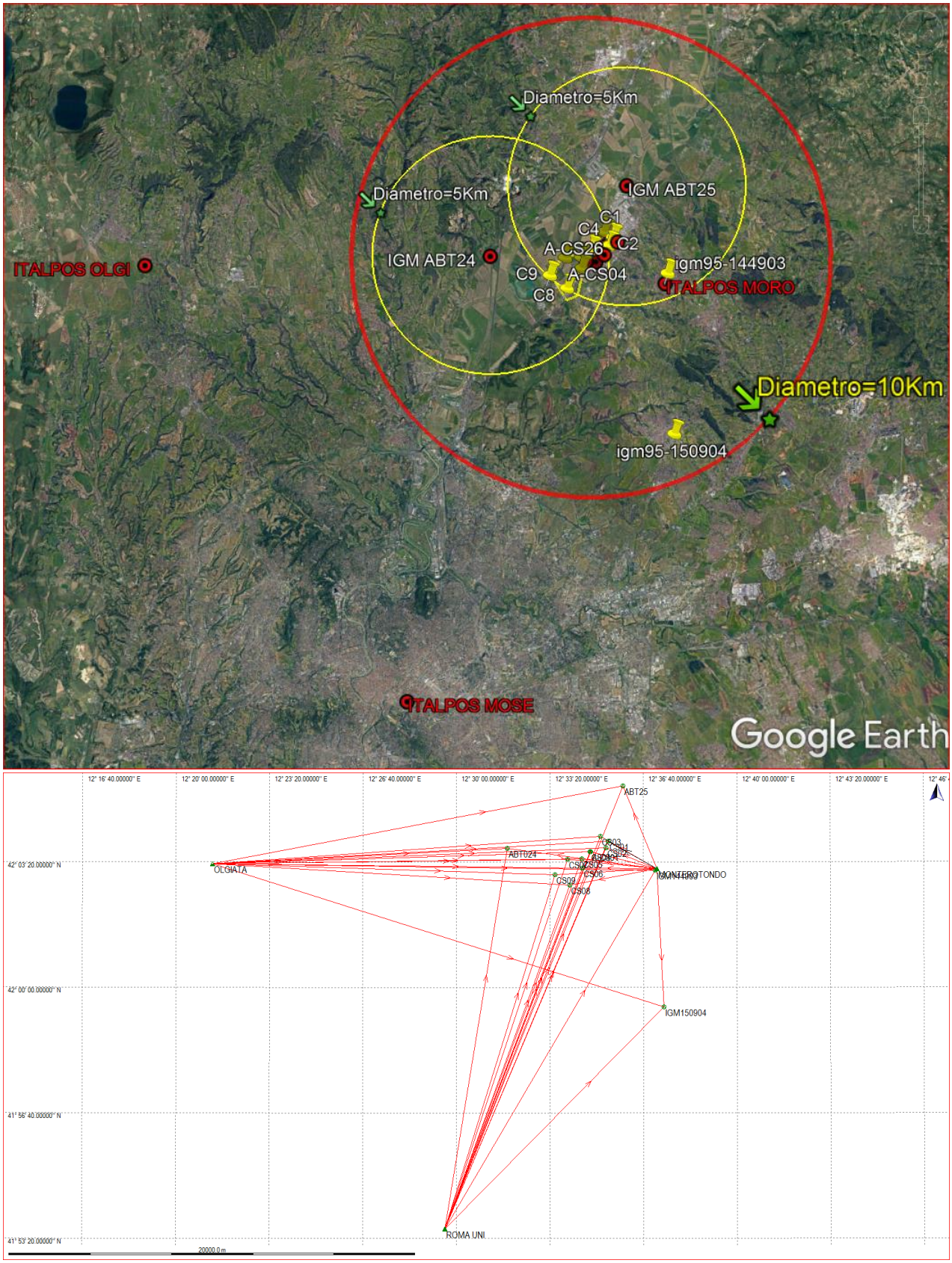

Diametro=5Km
Diametro=5Km
IGM ABT25
C1
C4
C2
A-CS26
IGM ABT24
ITALPOS OLGI
C9
A-CS04
igm95-144903
ITALPOS MORO
C8
Diametro=10Km
igm95-150904
ITALPOS MOSE
Google Earth
12° 16' 40.00000" E
12° 20' 00.00000" E
12° 23' 20.00000" E
12° 26' 40.00000" E
12° 30' 00.00000" E
12° 33' 20.00000" E
12° 36' 40.00000" E
12° 40' 00.00000" E
12° 43' 20.00000" E
42° 03' 20.00000" N
42° 00' 00.00000" N
41° 56' 40.00000" N
41° 53' 20.00000" N
ABT25
ABT024
OLGIATA
CS09
CS06
IGM150904
ROMA UNI
20000.0 m

Fig.1

Mappa dei Siti

Vai al sito:	MONTEROTONDO (MORO)

Sito MONTEROTONDO (MORO)

Nome:	MONTEROTONDO
Codice:	MORO
Latitudine:	42° 3' 9.07986" N
Longitudine:	12° 37' 8.55737" E
Quota:	201.573m
Tipo di Ricevitore:	LEICA GR30
Seriale Ricevitore:	
Costellazione	GPS e GLONASS
Antenna:	LEIAR10 NONE
Seriale Antenna:	
Antenna Reference Pnt:	MARKER
Raggio di Copertura:	30km
Angolo di elevazione:	10 °
Intervallo di campionamento:	1s
File disponibili:	MONTEROTONDO

Fig.2a

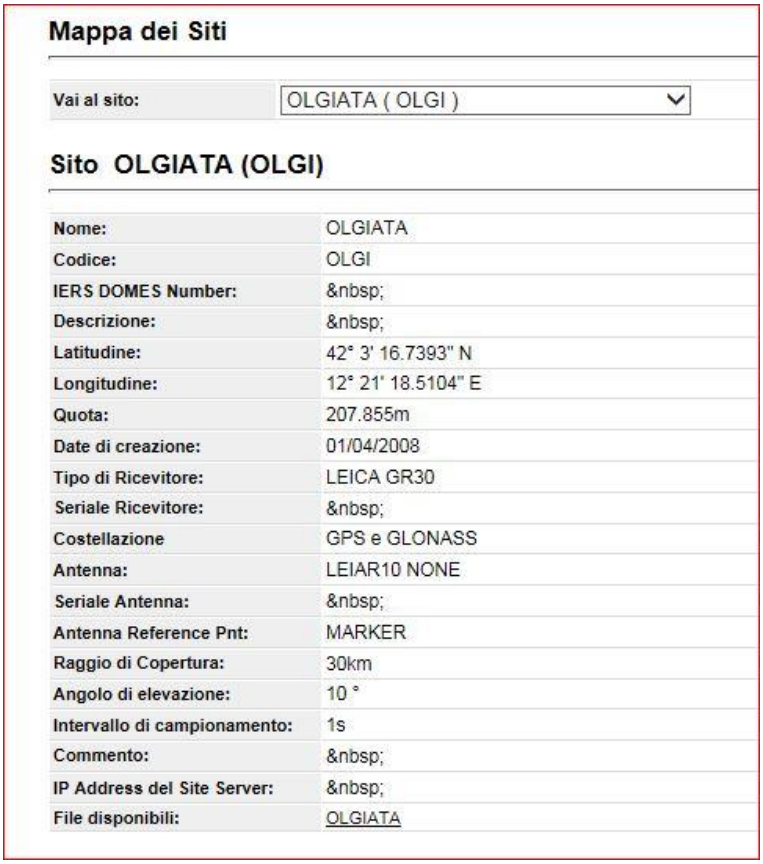
Mappa dei Siti

Vai al sito:	M0SE (M0SE)

Sito M0SE (M0SE)

Nome:	M0SE
Codice:	M0SE
IERS DOMES Number:	
Descrizione:	
Latitudine:	41° 53' 35.1987" N
Longitudine:	12° 29' 35.7169" E
Quota:	120.584m
Date di creazione:	26/06/2007
Tipo di Ricevitore:	LEICA GR25
Seriale Ricevitore:	1830126
Costellazione	GPS e GLONASS
Antenna:	LEIAR25.R4 LEIT
Seriale Antenna:	725219
Antenna Reference Pnt:	
Raggio di Copertura:	30km
Angolo di elevazione:	0 °
Intervallo di campionamento:	1s
Commento:	
IP Address del Site Server:	
File disponibili:	M0SE

Fig.2b



Mappa dei Siti

Vai al sito: OLGIATA (OLGI)

Sito OLGIATA (OLGI)

Nome:	OLGIATA
Codice:	OLGI
IERS DOMES Number:	
Descrizione:	
Latitudine:	42° 3' 16.7393" N
Longitudine:	12° 21' 18.5104" E
Quota:	207.855m
Date di creazione:	01/04/2008
Tipo di Ricevitore:	LEICA GR30
Seriale Ricevitore:	
Costellazione	GPS e GLONASS
Antenna:	LEIAR10 NONE
Seriale Antenna:	
Antenna Reference Pnt:	MARKER
Raggio di Copertura:	30km
Angolo di elevazione:	10 °
Intervallo di campionamento:	1s
Commento:	
IP Address del Site Server:	
File disponibili:	OLGIATA

Fig.2c

Successivamente ad una prima verifica della congruenza interna delle misure effettuate, eseguita secondo uno schema "libero", è stata calcolata la rete vincolata in corrispondenza dei vertici MORO, OLGI e MOSE (All.1 - schema rete). Nelle seguenti tabelle delle coordinate (*Figg.3-4)* e delle relative differenze (*Fig.5)* vengono riportati i risultati ottenuti.

	COORDINATE DA MONOGRAFIE				
	Vertice	Est (UTM-ETRF2000) (m)	Nord (UTM-ETRF2000) (m)	Quota (m)	
FIX	MORO	302971.171	4658350.652	201.573	Q.ellis.
FIX	OLGI	281138.540	4659228.914	207.855	Q.ellis.
FIX	MOSE	292042.949	4640947.244	120.584	Q.ellis.
	144903	302889.944	4658269.358	193.799	Q.ellis.
	150904	303134.199	4651537.504	136.350	Q.ellis.
	ABT0-025	301422.572	4662481.611	25.224	Q.orto.
	ABT0-024	295665.980	4659574.139	25.069	Q.orto.

Fig.3

COORDINATE DA MISURE STATICO				
Vertice	Est (UTM-ETRF2000) (m)	Nord (UTM-ETRF2000) (m)	Quota (m)	
MORO	302971.171	4658350.652	201.573	Q.ellis.
OLGI	281138.540	4659228.914	207.855	Q.ellis.
MOSE	292042.949	4640947.244	120.584	Q.ellis.
144903	302889.929	4658269.372	193.800	Q.ellis.
150904	303134.177	4651537.501	136.289	Q.ellis.
ABT0-025	301420.496	4662481.736	25.195	Q.orto.
ABT0-024-FC	295663.266	4659563.258	25.058	Q.orto.

Fig.4

DIFFERENZA DI COORDINATE				
Vertice	△Est (UTM-ETRF2000) (mm)	△Nord (UTM-ETRF2000) (mm)	△Quota (mm)	
MORO	0	0	0	Q.ellis.
OLGI	0	0	0	Q.ellis.
MOSE	0	0	0	Q.ellis.
144903	15	-14	-1	Q.ellis.
150904	22	3	61	Q.ellis.
ABT0-025	2076	-125	29	Q.orto.
ABT0-024-FC	-	-	11	Q.orto.

Fig.5

Le differenze delle coordinate planimetriche (*Fig.5)*, così come la quota del vertice 144903, sono compatibili con la precisione intrinseca della rete IGM95 [$\sigma_{95\%}$ (planimetria) = 25 mm, $\sigma_{95\%}$ (altimetria) = 40 mm] mentre la quota del vertice 150904 (61 mm) risulta fuori tolleranza. Tale valore, a parere della scrivente non è attribuibile ad una errore di esecuzione delle misure così come si evince dal report delle elaborazioni.
Per quanto riguarda i capisaldi ABT0-024 e ABT0-025 le differenze di quota risultano compatibili con le accuratezze altimetriche dei vertici della rete e del grigliato IGMI impiegato per la trasformazione da quote ellissoidiche a quelle geoidiche.
Sulla base dei suddetti risultati sono state calcolate le coordinate dei capisaldi nei sistemi di riferimento cartografici Gauss Boaga (*Fig.5)* e UTM-ETRF2000 (Fuso33) (*Fig.7)* con associate le rispettive Quote geoidiche ottenute tramite l'uso del software Verto 3 e grigliato 144903.GK2 rilasciati da IGMI.

COORDINATE DA MISURE STATICO			
Vertice	Est (Gauss Boaga) (m)	Nord (Gauss Boaga) (m)	Q.Geoid. (m)
CS1	2320639.177	4659786.508	23.199
CS2	2320498.898	4659465.664	23.713
CS3	2320267.086	4660018.651	23.883
CS4	2319723.252	4659290.721	22.571
CS5	2319297.612	4658958.890	22.281
CS6	2319318.690	4658502.503	24.203
CS7	2318620.130	4658946.537	22.913
CS8	2318688.900	4657673.282	22.339
CS9	2317969.968	4658216.129	22.359

Fig.6

COORDINATE DA MISURE STATICO				
Vertice	Est (UTM-ETRF2000-F33) (m)	Nord (UTM-ETRF2000-F33) (m)	Q.Elliss. (m)	Q.Geoid. (m)
CS1	300633.634	4659776.588	71.525	23.199
CS2	300493.359	4659455.752	72.034	23.713
CS3	300261.556	4660008.719	72.206	23.883
CS4	299717.736	4659280.806	70.882	22.571
CS5	299292.110	4658948.980	70.582	22.281
CS6	299313.185	4658492.608	72.499	24.203
CS7	298614.652	4658936.619	71.205	22.913
CS8	298683.413	4657663.406	70.620	22.339
CS9	297964.509	4658206.227	70.639	22.359

Fig.7

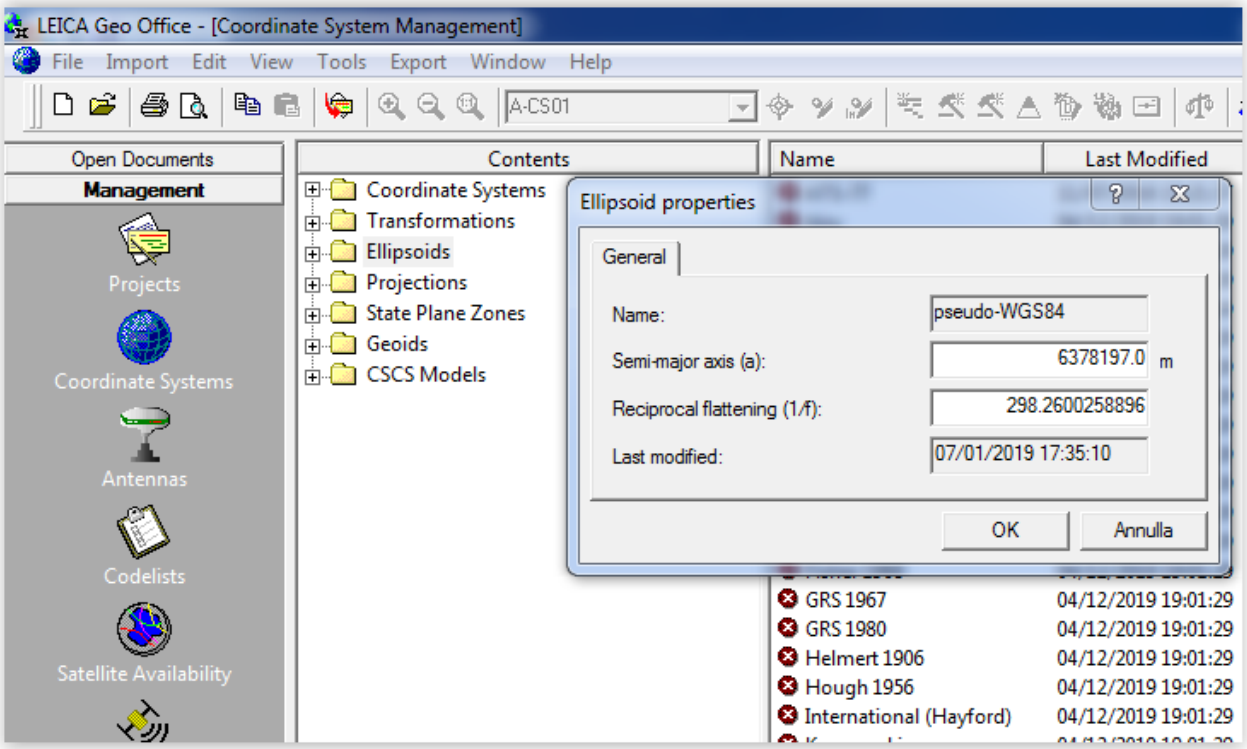
2. CALCOLO DELLE COORDINATE RETTILIEE DEI CAPISALDI DI NUOVA ISTITUZIONE

Sulla base dei parametri per la definizione del sistema di coordinate rettilinee forniti da Anas e di seguito riportati:

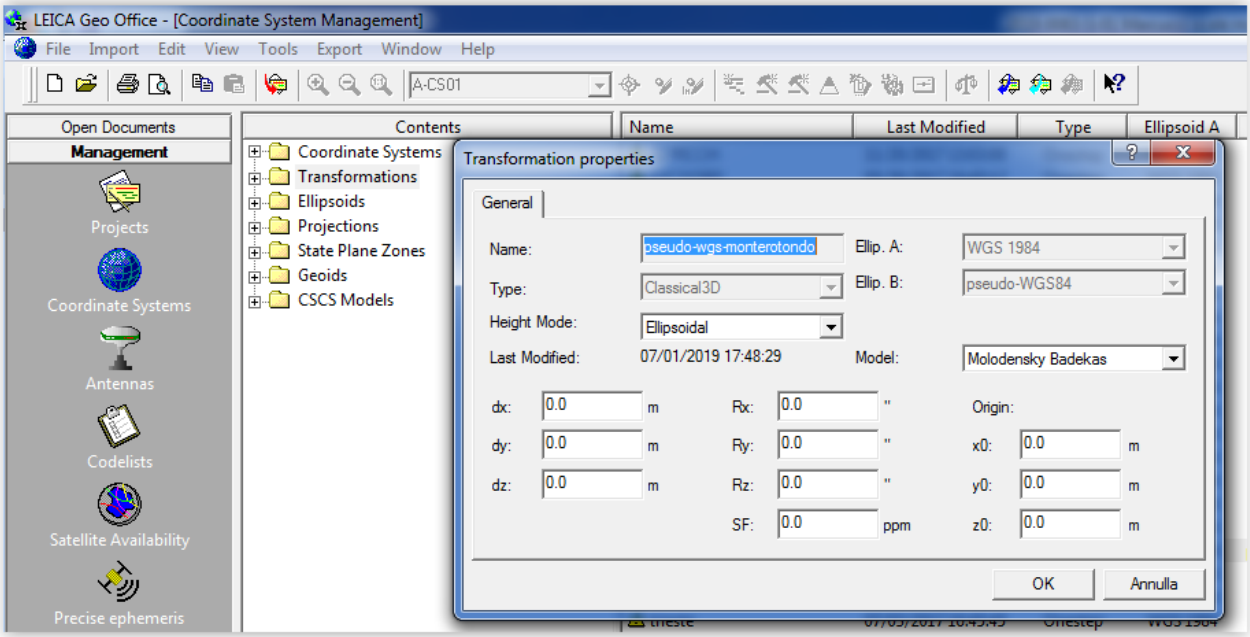
Falsa EST 299624.62
Falsa Nord 4658875.68
Lat meridiano centrale 42°03'23.0430"
Long meridiano centrale 12°34'42.4489"
Quota media sul piano WGS84 = 60 m
coefficiente di contrazione = 1.00000941

si è proceduto al calcolo delle coordinate dei capisaldi secondo le seguenti fasi:

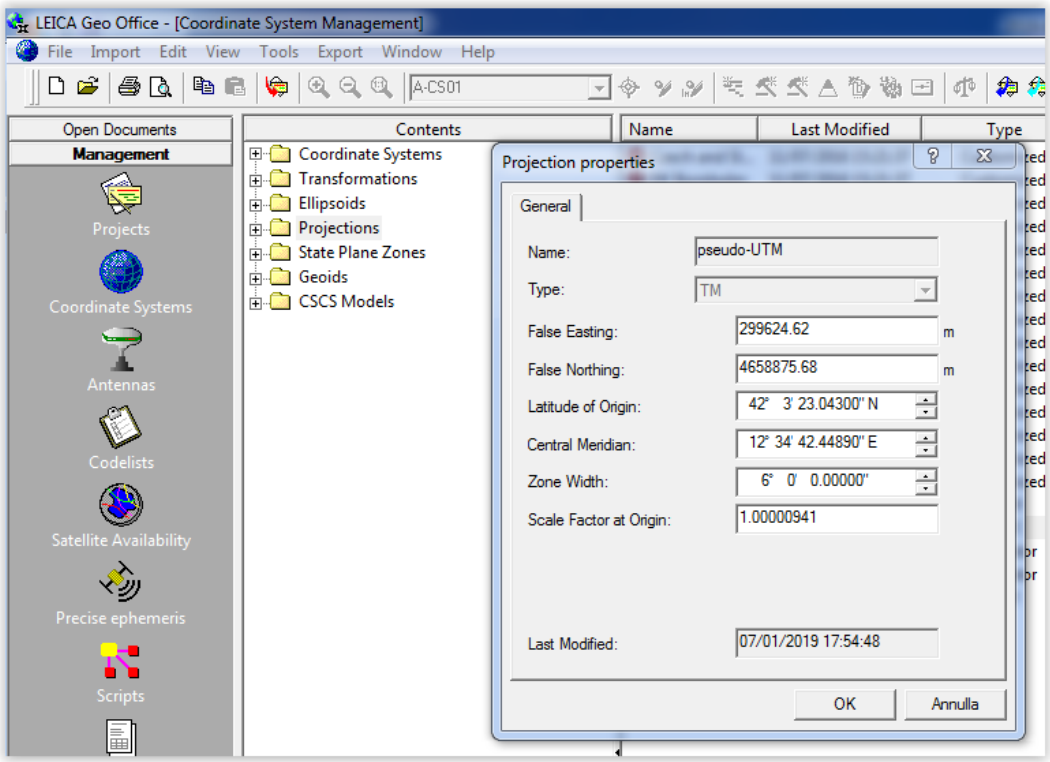
1. definizione dell'ellissoide che tenga conto della quota media rispetto al sistema WGS84



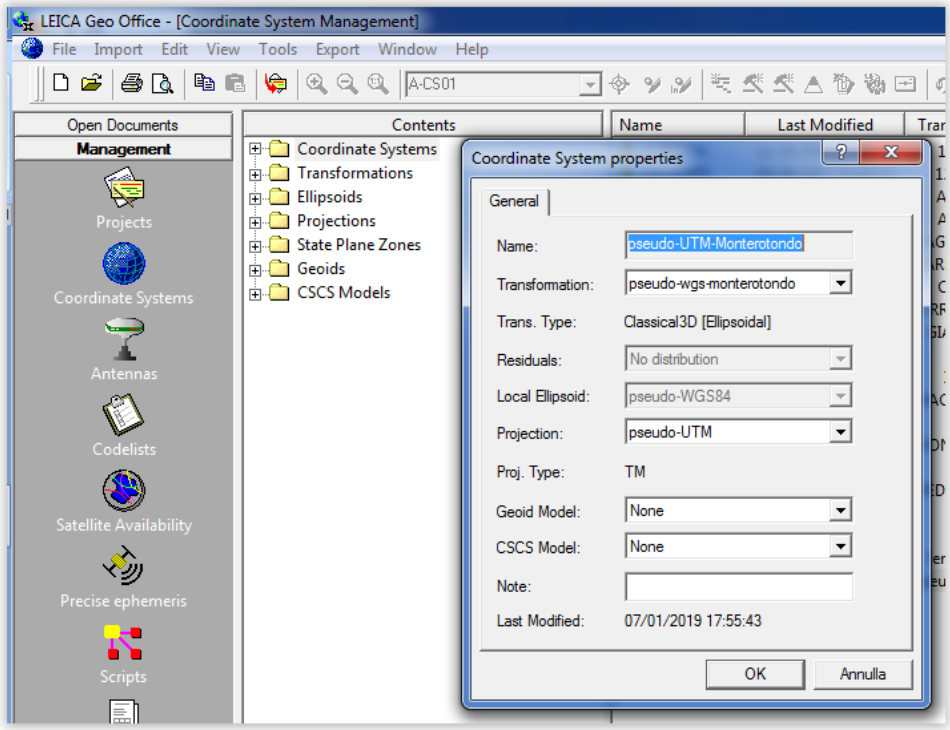
2. definizione del tipo di trasformazione tra Datum



3. inserimento dei parametri del sistema rettilineo e adozione del tipo di proiezione TM (*Transverse of Mercator).*



4. definizione del sistema di coordinate denominato pseudo-UTM-Monterotondo



5. applicazione del sistema di riferimento al set di coordinate dei capisaldi originariamente determinate nel sistema ETRF2000 e relative quote ellissoidiche e successivo ricalcolo delle coordinate così come di seguito riportate.

CAPOSALDO	EST (m)	NORD (m)	Q geoidica (m)
CS1	300607.645	4659804.733	23.199
CS2	300476.522	4659480.077	23.713
CS3	300229.170	4660026.218	23.883
CS4	299706.221	4659283.250	22.571
CS5	299290.194	4658939.531	22.281
CS6	299324.181	4658483.973	24.203
CS7	298613.410	4658907.994	22.913
CS8	298718.185	4657637.340	22.339
CS9	297984.261	4658159.547	22.359

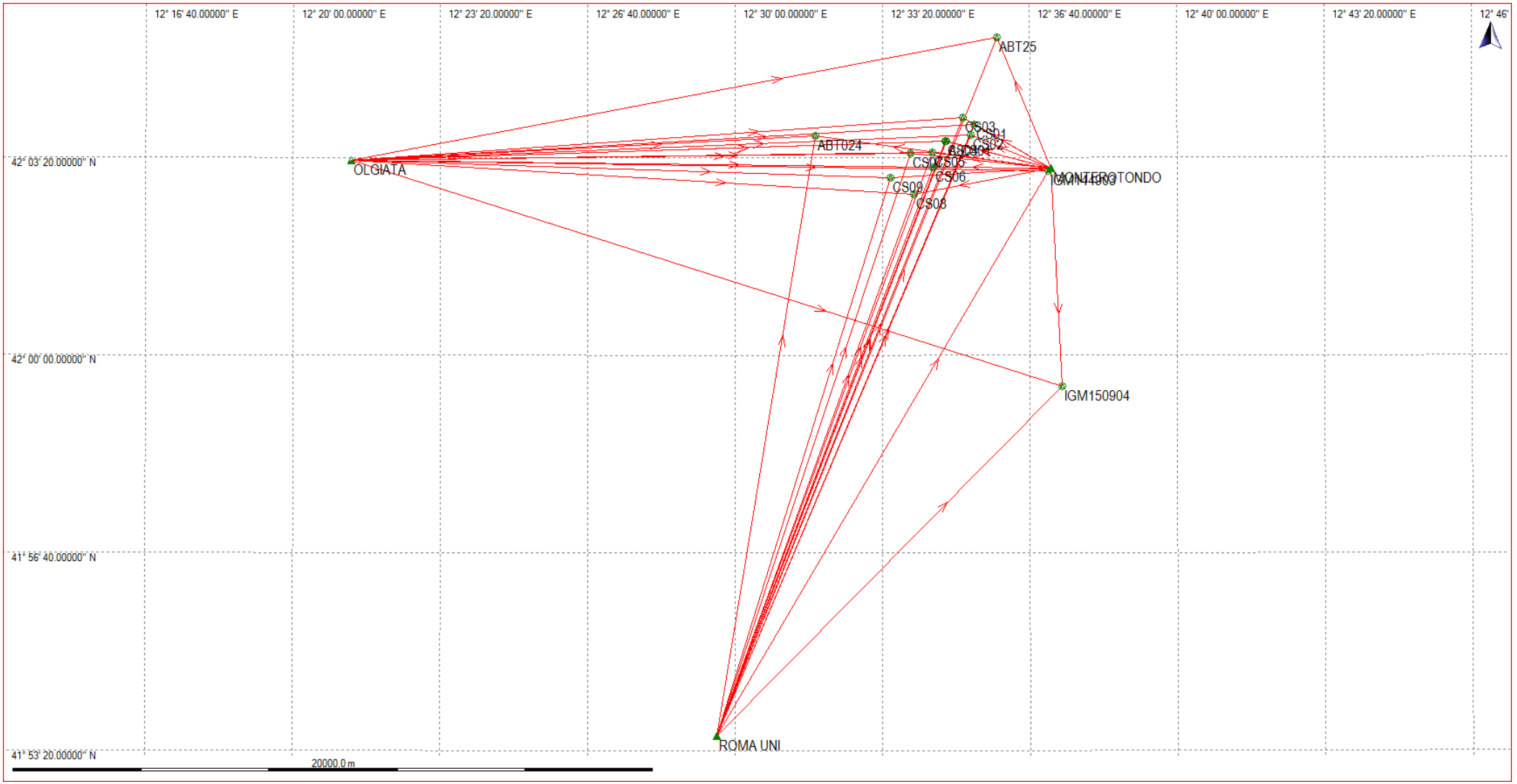
Tutte le elaborazioni e le trasformazioni effettuate sono state eseguite con l'ausilio del software Leica GeoOffice di Leica Geosystems r.7.
Il sistema di riferimento così istituito è stato adottato per la georeferenziazione del modello fotogrammetrico e topografico.

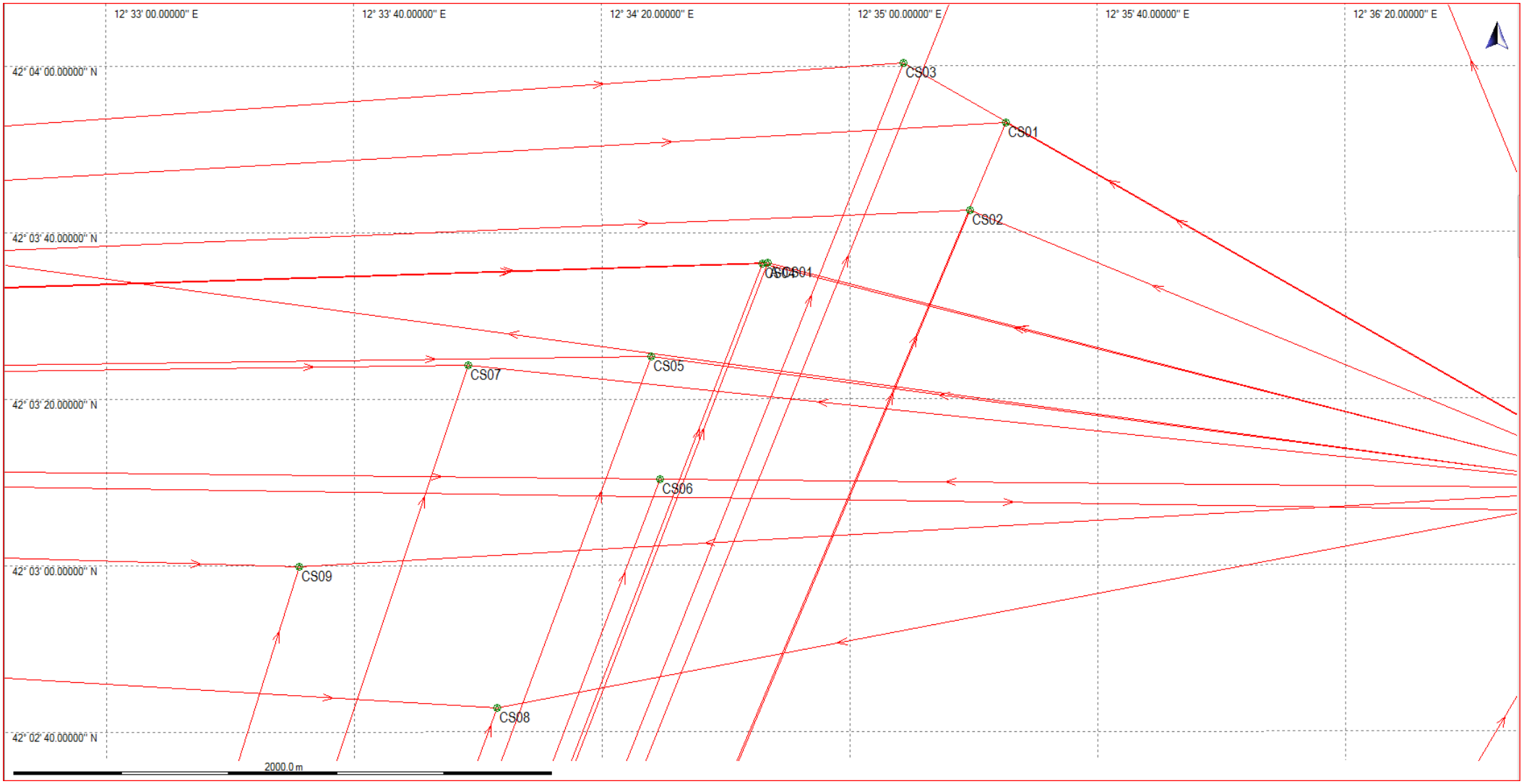
LS Rilievi s.n.c.
Dott.Ing.Silvia Grassi

LS RILIEVI s.n.c.

ALLEGATO 1

SCHEMA RETE


12° 16' 40.00000" E
12° 20' 00.00000" E
12° 23' 20.00000" E
12° 26' 40.00000" E
12° 30' 00.00000" E
12° 33' 20.00000" E
12° 36' 40.00000" E
12° 40' 00.00000" E
12° 43' 20.00000" E
12° 46'
42° 03' 20.00000" N
42° 00' 00.00000" N
41° 56' 40.00000" N
41° 53' 20.00000" N
20000.0 m
ABT25
ABT024
OLGIATA
CS03
CS01
CS02
CS04
CS05
CS06
CS09
CS08
MONTEROTONDO
IGM150904
ROMA UNI


12° 33' 00.00000" E
12° 33' 40.00000" E
12° 34' 20.00000" E
12° 35' 00.00000" E
12° 35' 40.00000" E
12° 36' 20.00000" E
42° 04' 00.00000" N
42° 03' 40.00000" N
42° 03' 20.00000" N
42° 03' 00.00000" N
42° 02' 40.00000" N
CS03
CS01
CS02
CS04
CS05
CS07
CS06
CS09
CS08
2000.0 m

ALLEGATO 2

BASELINE PROCESSING

- when it has to be right

Processing Summary
LSR0055SIN-Monterotondo-100519-STAT-01

Project Information

Project name:	LSR0055SIN-Monterotondo-100519-STAT-01
Date created:	05/13/2019 14:58:09
Time zone:	1h 00'
Coordinate system name:	WGS 1984
Application software:	LEICA Geo Office 7.0
Start date and time:	05/10/2019 07:00:57
End date and time:	05/10/2019 12:35:22
Manually occupied points:	14
Processing kernel:	PSI-Pro 2.0
Processed:	05/13/2019 17:29:52

Processing Parameters

Parameters	**Selected**
Cut-off angle:	15°
Ephemeris type:	Broadcast
Solution type:	Automatic
GNSS type:	Automatic
Frequency:	Automatic
Fix ambiguities up to:	80 km
Min. duration for float solution (static):	5' 00"
Sampling rate:	Use all
Tropospheric model:	Hopfield
Ionospheric model:	Automatic
Use stochastic modelling:	Yes
Min. distance:	8 km
Ionospheric activity:	Automatic

Baseline Overview

ROMA UNI - IGM150904	**Reference: ROMA UNI**	**Rover: IGM150904**
Receiver type / S/N:	LEICAGR25 / 1830126	GX1230GG / 467941
Antenna type / S/N:	LEIAR25.R4 LEIT / -	AX1202 GG Pole / -
Antenna height:	0.000 m	1.400 m
Coordinates:		
X:	4642432.760 m	4632987.607 m
Y:	1028629.174 m	1037573.601 m
Z:	4236854.016 m	4244972.918 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:28:42 - 05/10/2019 08:15:32		
Duration:	46' 50"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -9445.153 m	dY: 8944.427 m	dZ: 8118.902 m
	Slope: 15333.958 m	dHgt: 15.690 m	

Number of used satellites:	GPS: 10 GLONASS: -		
ROMA UNI - CS01	**Reference: ROMA UNI**		**Rover: CS01**
Receiver type / S/N:	LEICAGR25 / 1830126		GX1230 / 451551
Antenna type / S/N:	LEIAR25.R4 LEIT / -		AX1202 Tripod / -
Antenna height:	0.000 m		0.405 m
Coordinates:			
X:	4642432.760 m		4628201.592 m
Y:	1028629.174 m		1033705.929 m
Z:	4236854.016 m		4250994.939 m
Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:05:52 - 05/10/2019 07:51:07		
Duration:	45' 15"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -14231.168 m	dY: 5076.755 m	dZ: 14140.923 m
	Slope: 20694.572 m	dHgt: -49.083 m	
Number of used satellites:	GPS: 8 GLONASS: -		
ROMA UNI - IGM144903	**Reference: ROMA UNI**		**Rover: IGM144903**
Receiver type / S/N:	LEICAGR25 / 1830126		GX1230GG / 467941
Antenna type / S/N:	LEIAR25.R4 LEIT / -		AX1202 GG Pole / -
Antenna height:	0.000 m		2.300 m
Coordinates:			
X:	4642432.760 m		4628732.437 m
Y:	1028629.174 m		1036178.863 m
Z:	4236854.016 m		4250005.211 m
Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 09:16:32 - 05/10/2019 10:17:07		
Duration:	1h 00' 35"		
Quality:	Sd. X: 0.002 m	Sd. Y: 0.001 m	Sd. Z: 0.002 m
	Posn. Qlty: 0.002 m	Hgt. Qlty: 0.003 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -13700.323 m	dY: 7549.689 m	dZ: 13151.195 m
	Slope: 20436.501 m	dHgt: 73.204 m	
Number of used satellites:	GPS: 7 GLONASS: -		
ROMA UNI - CS04	**Reference: ROMA UNI**		**Rover: CS04**
Receiver type / S/N:	LEICAGR25 / 1830126		GX1230 / 451551
Antenna type / S/N:	LEIAR25.R4 LEIT / -		AX1202 Tripod / -
Antenna height:	0.000 m		1.066 m
Coordinates:			
X:	4642432.760 m		4628738.472 m
Y:	1028629.174 m		1032902.134 m
Z:	4236854.016 m		4250607.394 m
Solution type:	Phase: all fix		

GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 08:05:07 - 05/10/2019 08:50:32		
Duration:	45' 25"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -13694.288 m	dY: 4272.960 m	dZ: 13753.378 m
	Slope: 19873.276 m	dHgt: -49.726 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

ROMA UNI - A-CS01	**Reference: ROMA UNI**	**Rover: A-CS01**
Receiver type / S/N:	LEICAGR25 / 1830126	GX1230 / 451551
Antenna type / S/N:	LEIAR25.R4 LEIT / -	AX1202 Tripod / -
Antenna height:	0.000 m	1.127 m
Coordinates:		
X:	4642432.760 m	4628731.863 m
Y:	1028629.174 m	1032917.990 m
Z:	4236854.016 m	4250610.588 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 08:57:27 - 05/10/2019 09:43:02		
Duration:	45' 35"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.002 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -13700.897 m	dY: 4288.815 m	dZ: 13756.572 m
	Slope: 19883.455 m	dHgt: -49.812 m	
Number of used satellites:	GPS: 7		
	GLONASS: -		

ROMA UNI - CS09	**Reference: ROMA UNI**	**Rover: CS09**
Receiver type / S/N:	LEICAGR25 / 1830126	Unknown / -
Antenna type / S/N:	LEIAR25.R4 LEIT / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4642432.760 m	4629847.777 m
Y:	1028629.174 m	1031385.368 m
Z:	4236854.016 m	4249772.751 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:00:57 - 05/10/2019 07:46:52		
Duration:	45' 55"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -12584.983 m	dY: 2756.193 m	dZ: 12918.735 m
	Slope: 18244.783 m	dHgt: -49.965 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

ROMA UNI - CS08	**Reference: ROMA UNI**		**Rover: CS08**
Receiver type / S/N:	LEICAGR25 / 1830126		Unknown / -
Antenna type / S/N:	LEIAR25.R4 LEIT / -		GS18 Pole / -
Antenna height:	0.000 m		2.000 m
Coordinates:			
X:	4642432.760 m		4630029.399 m
Y:	1028629.174 m		1032177.856 m
Z:	4236854.016 m		4249385.047 m
Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:58:47 - 05/10/2019 08:44:47		
Duration:	46' 00"		
Quality:	Sd. X: 0.002 m	Sd. Y: 0.001 m	Sd. Z: 0.002 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.002 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -12403.361 m	dY: 3548.682 m	dZ: 12531.031 m
	Slope: 17985.084 m	dHgt: -49.982 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

ROMA UNI - CS07	**Reference: ROMA UNI**		**Rover: CS07**
Receiver type / S/N:	LEICAGR25 / 1830126		Unknown / -
Antenna type / S/N:	LEIAR25.R4 LEIT / -		GS18 Pole / -
Antenna height:	0.000 m		2.000 m
Coordinates:			
X:	4642432.760 m		4629221.975 m
Y:	1028629.174 m		1031890.346 m
Z:	4236854.016 m		4250328.936 m
Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 08:56:32 - 05/10/2019 09:42:37		
Duration:	46' 05"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -13210.785 m	dY: 3261.172 m	dZ: 13474.920 m
	Slope: 19150.289 m	dHgt: -49.412 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

ROMA UNI - CS06	**Reference: ROMA UNI**	**Rover: CS06**
Receiver type / S/N:	LEICAGR25 / 1830126	Unknown / -
Antenna type / S/N:	LEIAR25.R4 LEIT / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4642432.760 m	4629345.395 m
Y:	1028629.174 m	1032646.129 m
Z:	4236854.016 m	4250015.029 m
Solution type:	Phase: all fix	
GNSS type:	GPS	
Frequency:	IonoFree (L3)	

Ambiguity:	Yes		
Time span:	05/10/2019 09:49:27 - 05/10/2019 10:35:57		
Duration:	46' 30"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -13087.365 m	dY: 4016.955 m	dZ: 13161.013 m
	Slope: 18990.190 m	dHgt: -48.103 m	
Number of used satellites:	GPS: 10		
	GLONASS: -		

ROMA UNI - ABT024	**Reference: ROMA UNI**	**Rover: ABT024**
Receiver type / S/N:	LEICAGR25 / 1830126	Unknown / -
Antenna type / S/N:	LEIAR25.R4 LEIT / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4642432.760 m	4629512.508 m
Y:	1028629.174 m	1028914.529 m
Z:	4236854.016 m	4250731.083 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 11:45:17 - 05/10/2019 12:35:22		
Duration:	50' 05"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -12920.252 m	dY: 285.355 m	dZ: 13877.067 m
	Slope: 18962.788 m	dHgt: -49.482 m	
Number of used satellites:	GPS: 9		
	GLONASS: -		

ROMA UNI - CS03	**Reference: ROMA UNI**	**Rover: CS03**
Receiver type / S/N:	LEICAGR25 / 1830126	GX1230 / 456303
Antenna type / S/N:	LEIAR25.R4 LEIT / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4642432.760 m	4628139.714 m
Y:	1028629.174 m	1033304.344 m
Z:	4236854.016 m	4251159.841 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:02:02 - 05/10/2019 07:53:02		
Duration:	51' 00"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -14293.046 m	dY: 4675.169 m	dZ: 14305.825 m
	Slope: 20755.843 m	dHgt: -48.407 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

ROMA UNI - CS02	**Reference: ROMA UNI**	**Rover: CS02**

Receiver type / S/N:	LEICAGR25 / 1830126	GX1230 / 456303
Antenna type / S/N:	LEIAR25.R4 LEIT / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4642432.760 m	4628442.824 m
Y:	1028629.174 m	1033625.404 m
Z:	4236854.016 m	4250754.258 m

Solution type: Phase: all fix
GNSS type: GPS
Frequency: IonoFree (L3)
Ambiguity: Yes
Time span: 05/10/2019 08:09:37 - 05/10/2019 09:00:02
Duration: 50' 25"

Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -13989.936 m	dY: 4996.229 m	dZ: 13900.242 m
	Slope: 20344.467 m	dHgt: -48.572 m	

Number of used satellites: GPS: 8
GLONASS: -

ROMA UNI - CS05	**Reference: ROMA UNI**	**Rover: CS05**
Receiver type / S/N:	LEICAGR25 / 1830126	GX1230 / 456303
Antenna type / S/N:	LEIAR25.R4 LEIT / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4642432.760 m	4629053.563 m
Y:	1028629.174 m	1032546.183 m
Z:	4236854.016 m	4250351.985 m

Solution type: Phase: all fix
GNSS type: GPS
Frequency: IonoFree (L3)
Ambiguity: Yes
Time span: 05/10/2019 09:21:42 - 05/10/2019 10:10:27
Duration: 48' 45"

Quality:	Sd. X: 0.002 m	Sd. Y: 0.001 m	Sd. Z: 0.002 m
	Posn. Qlty: 0.002 m	Hgt. Qlty: 0.003 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -13379.197 m	dY: 3917.009 m	dZ: 13497.969 m
	Slope: 19404.666 m	dHgt: -50.040 m	

Number of used satellites: GPS: 7
GLONASS: -

ROMA UNI - ABT25	**Reference: ROMA UNI**	**Rover: ABT25**
Receiver type / S/N:	LEICAGR25 / 1830126	GX1230 / 456303
Antenna type / S/N:	LEIAR25.R4 LEIT / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4642432.760 m	4626265.347 m
Y:	1028629.174 m	1034001.200 m
Z:	4236854.016 m	4253019.655 m

Solution type: Phase: all fix
GNSS type: GPS
Frequency: IonoFree (L3)
Ambiguity: Yes
Time span: 05/10/2019 10:47:57 - 05/10/2019 11:38:57

Duration:	51' 00"		
Quality:	Sd. X: 0.001 m Posn. Qlty: 0.001 m	Sd. Y: 0.000 m Hgt. Qlty: 0.001 m	Sd. Z: 0.001 m Sd. Slope: 0.001 m
Baseline vector:	dX: -16167.413 m Slope: 23485.565 m	dY: 5372.025 m dHgt: -47.057 m	dZ: 16165.639 m
Number of used satellites:	GPS: 8 GLONASS: -		

- when it has to be right

Processing Summary
LSR0055SIN-Monterotondo-100519-STAT-01

Project Information

Project name:	LSR0055SIN-Monterotondo-100519-STAT-01
Date created:	05/13/2019 14:58:09
Time zone:	1h 00'
Coordinate system name:	WGS 1984
Application software:	LEICA Geo Office 7.0
Start date and time:	05/10/2019 07:00:57
End date and time:	05/10/2019 12:35:22
Manually occupied points:	14
Processing kernel:	PSI-Pro 2.0
Processed:	05/13/2019 17:31:35

Processing Parameters

Parameters	**Selected**
Cut-off angle:	15°
Ephemeris type:	Broadcast
Solution type:	Automatic
GNSS type:	Automatic
Frequency:	Automatic
Fix ambiguities up to:	80 km
Min. duration for float solution (static):	5' 00"
Sampling rate:	Use all
Tropospheric model:	Hopfield
Ionospheric model:	Automatic
Use stochastic modelling:	Yes
Min. distance:	8 km
Ionospheric activity:	Automatic

Baseline Overview

MONTEROTONDO - IGM150904	**Reference: MONTEROTONDO**	**Rover: IGM150904**
Receiver type / S/N:	LEICAGR30 / 1706414	GX1230GG / 467941
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 GG Pole / -
Antenna height:	0.000 m	1.400 m
Coordinates:		
X:	4628666.238 m	4632987.650 m
Y:	1036244.928 m	1037573.596 m
Z:	4250072.449 m	4244972.912 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 07:28:42 - 05/10/2019 08:15:32		
Duration:	46' 50"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 4321.412 m	dY: 1328.668 m	dZ: -5099.537 m
	Slope: 6815.074 m	dHgt: -65.273 m	

Number of used satellites:	GPS: 10 GLONASS: -	

MONTEROTONDO - CS01	**Reference: MONTEROTONDO**	**Rover: CS01**
Receiver type / S/N:	LEICAGR30 / 1706414	GX1230 / 451551
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Tripod / -
Antenna height:	0.000 m	0.405 m
Coordinates:		
X:	4628666.238 m	4628201.632 m
Y:	1036244.928 m	1033705.932 m
Z:	4250072.449 m	4250994.941 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 07:05:52 - 05/10/2019 07:51:07		
Duration:	45' 15"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.000 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -464.607 m	dY: -2538.996 m	dZ: 922.492 m
	Slope: 2741.049 m	dHgt: -130.042 m	
Number of used satellites:	GPS: 8 GLONASS: -		

MONTEROTONDO - IGM144903	**Reference: MONTEROTONDO**	**Rover: IGM144903**
Receiver type / S/N:	LEICAGR30 / 1706414	GX1230GG / 467941
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 GG Pole / -
Antenna height:	0.000 m	2.300 m
Coordinates:		
X:	4628666.238 m	4628732.442 m
Y:	1036244.928 m	1036178.847 m
Z:	4250072.449 m	4250005.263 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 09:16:32 - 05/10/2019 10:17:07		
Duration:	1h 00' 35"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 66.204 m	dY: -66.081 m	dZ: -67.186 m
	Slope: 115.168 m	dHgt: -7.750 m	
Number of used satellites:	GPS: 8 GLONASS: -		

MONTEROTONDO - CS04	**Reference: MONTEROTONDO**	**Rover: CS04**
Receiver type / S/N:	LEICAGR30 / 1706414	GX1230 / 451551
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Tripod / -
Antenna height:	0.000 m	1.066 m
Coordinates:		
X:	4628666.238 m	4628738.503 m
Y:	1036244.928 m	1032902.141 m
Z:	4250072.449 m	4250607.409 m

Solution type:	Phase: all fix

GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 08:05:07 - 05/10/2019 08:50:32		
Duration:	45' 25"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.000 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 72.264 m	dY: -3342.786 m	dZ: 534.960 m
	Slope: 3386.093 m	dHgt: -130.683 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

MONTEROTONDO - A-CS01	**Reference: MONTEROTONDO**	**Rover: A-CS01**
Receiver type / S/N:	LEICAGR30 / 1706414	GX1230 / 451551
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Tripod / -
Antenna height:	0.000 m	1.127 m
Coordinates:		
X:	4628666.238 m	4628731.900 m
Y:	1036244.928 m	1032917.993 m
Z:	4250072.449 m	4250610.605 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 08:57:27 - 05/10/2019 09:43:02		
Duration:	45' 35"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 65.661 m	dY: -3326.935 m	dZ: 538.156 m
	Slope: 3370.818 m	dHgt: -130.763 m	
Number of used satellites:	GPS: 7		
	GLONASS: -		

MONTEROTONDO - CS09	**Reference: MONTEROTONDO**	**Rover: CS09**
Receiver type / S/N:	LEICAGR30 / 1706414	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4629847.806 m
Y:	1036244.928 m	1031385.369 m
Z:	4250072.449 m	4249772.758 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 07:00:57 - 05/10/2019 07:46:52		
Duration:	45' 55"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.000 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 1181.567 m	dY: -4859.558 m	dZ: -299.691 m
	Slope: 5010.112 m	dHgt: -130.928 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

MONTEROTONDO - CS08	**Reference: MONTEROTONDO**	**Rover: CS08**
Receiver type / S/N:	LEICAGR30 / 1706414	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4630029.418 m
Y:	1036244.928 m	1032177.861 m
Z:	4250072.449 m	4249385.065 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 07:58:47 - 05/10/2019 08:44:47		
Duration:	46' 00"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 1363.180 m	dY: -4067.067 m	dZ: -687.384 m
	Slope: 4344.167 m	dHgt: -130.945 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

MONTEROTONDO - CS07	**Reference: MONTEROTONDO**	**Rover: CS07**
Receiver type / S/N:	LEICAGR30 / 1706414	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4629222.009 m
Y:	1036244.928 m	1031890.351 m
Z:	4250072.449 m	4250328.962 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 08:56:32 - 05/10/2019 09:42:37		
Duration:	46' 05"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.000 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 555.771 m	dY: -4354.577 m	dZ: 256.513 m
	Slope: 4397.388 m	dHgt: -130.359 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

MONTEROTONDO - CS06	**Reference: MONTEROTONDO**	**Rover: CS06**
Receiver type / S/N:	LEICAGR30 / 1706414	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4629345.426 m
Y:	1036244.928 m	1032646.131 m
Z:	4250072.449 m	4250015.044 m

Solution type:	Phase: all fix
GNSS type:	GPS
Frequency:	L1 and L2

Ambiguity:	Yes		
Time span:	05/10/2019 09:49:27 - 05/10/2019 10:35:57		
Duration:	46' 30"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 679.187 m	dY: -3598.796 m	dZ: -57.405 m
	Slope: 3662.776 m	dHgt: -129.059 m	
Number of used satellites:	GPS: 10		
	GLONASS: -		

MONTEROTONDO - ABT024	**Reference: MONTEROTONDO**	**Rover: ABT024**
Receiver type / S/N:	LEICAGR30 / 1706414	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4629512.530 m
Y:	1036244.928 m	1028914.533 m
Z:	4250072.449 m	4250731.105 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 11:45:17 - 05/10/2019 12:35:22		
Duration:	50' 05"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.000 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 846.292 m	dY: -7330.395 m	dZ: 658.656 m
	Slope: 7408.422 m	dHgt: -130.441 m	
Number of used satellites:	GPS: 9		
	GLONASS: -		

MONTEROTONDO - CS03	**Reference: MONTEROTONDO**	**Rover: CS03**
Receiver type / S/N:	LEICAGR30 / 1706414	GX1230 / 456303
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4628139.755 m
Y:	1036244.928 m	1033304.345 m
Z:	4250072.449 m	4251159.855 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 07:02:02 - 05/10/2019 07:53:02		
Duration:	51' 00"		
Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.000 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -526.483 m	dY: -2940.583 m	dZ: 1087.406 m
	Slope: 3179.098 m	dHgt: -129.358 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

MONTEROTONDO - CS02	**Reference: MONTEROTONDO**	**Rover: CS02**

Receiver type / S/N:	LEICAGR30 / 1706414	GX1230 / 456303
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4628442.854 m
Y:	1036244.928 m	1033625.411 m
Z:	4250072.449 m	4250754.274 m
Solution type:	Phase: all fix	
GNSS type:	GPS	
Frequency:	L1 and L2	
Ambiguity:	Yes	
Time span:	05/10/2019 08:09:37 - 05/10/2019 09:00:02	
Duration:	50' 25"	

Quality:	Sd. X: 0.000 m	Sd. Y: 0.000 m	Sd. Z: 0.000 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.000 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -223.384 m	dY: -2619.517 m	dZ: 681.825 m
	Slope: 2716.000 m	dHgt: -129.528 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

MONTEROTONDO - CS05	**Reference: MONTEROTONDO**	**Rover: CS05**
Receiver type / S/N:	LEICAGR30 / 1706414	GX1230 / 456303
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4629053.611 m
Y:	1036244.928 m	1032546.199 m
Z:	4250072.449 m	4250352.008 m
Solution type:	Phase: all fix	
GNSS type:	GPS	
Frequency:	L1 and L2	
Ambiguity:	Yes	
Time span:	05/10/2019 09:21:42 - 05/10/2019 10:10:27	
Duration:	48' 45"	

Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: 387.372 m	dY: -3698.729 m	dZ: 279.559 m
	Slope: 3729.451 m	dHgt: -130.977 m	
Number of used satellites:	GPS: 7		
	GLONASS: -		

MONTEROTONDO - ABT25	**Reference: MONTEROTONDO**	**Rover: ABT25**
Receiver type / S/N:	LEICAGR30 / 1706414	GX1230 / 456303
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4628666.238 m	4626265.384 m
Y:	1036244.928 m	1034001.216 m
Z:	4250072.449 m	4253019.673 m
Solution type:	Phase: all fix	
GNSS type:	GPS	
Frequency:	L1 and L2	
Ambiguity:	Yes	
Time span:	05/10/2019 10:47:57 - 05/10/2019 11:38:57	

Duration:	51' 00"		
Quality:	Sd. X: 0.000 m Posn. Qlty: 0.000 m	Sd. Y: 0.000 m Hgt. Qlty: 0.001 m	Sd. Z: 0.000 m Sd. Slope: 0.000 m
Baseline vector:	dX: -2400.855 m Slope: 4414.122 m	dY: -2243.712 m dHgt: -128.005 m	dZ: 2947.224 m
Number of used satellites:	GPS: 9 GLONASS: -		

- when it has to be right

Processing Summary
LSR0055SIN-Monterotondo-100519-STAT-01

Project Information

Project name:	LSR0055SIN-Monterotondo-100519-STAT-01
Date created:	05/13/2019 14:58:09
Time zone:	1h 00'
Coordinate system name:	WGS 1984
Application software:	LEICA Geo Office 7.0
Start date and time:	05/10/2019 07:00:57
End date and time:	05/10/2019 12:35:22
Manually occupied points:	14
Processing kernel:	PSI-Pro 2.0
Processed:	05/13/2019 17:32:30

Processing Parameters

Parameters	**Selected**
Cut-off angle:	15°
Ephemeris type:	Broadcast
Solution type:	Automatic
GNSS type:	Automatic
Frequency:	Automatic
Fix ambiguities up to:	80 km
Min. duration for float solution (static):	5' 00"
Sampling rate:	Use all
Tropospheric model:	Hopfield
Ionospheric model:	Automatic
Use stochastic modelling:	Yes
Min. distance:	8 km
Ionospheric activity:	Automatic

Baseline Overview

OLGIATA - IGM150904	**Reference: OLGIATA**	**Rover: IGM150904**
Receiver type / S/N:	LEICAGR30 / 1706275	GX1230GG / 467941
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 GG Pole / -
Antenna height:	0.000 m	1.400 m
Coordinates:		
X:	4633239.945 m	4632987.594 m
Y:	1014881.696 m	1037573.585 m
Z:	4250252.138 m	4244972.890 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:28:42 - 05/10/2019 08:15:32		
Duration:	46' 50"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -252.350 m	dY: 22691.889 m	dZ: -5279.247 m
	Slope: 23299.269 m	dHgt: -71.611 m	

Number of used satellites:	GPS: 10 GLONASS: -		

OLGIATA - CS01	**Reference: OLGIATA**	**Rover: CS01**
Receiver type / S/N:	LEICAGR30 / 1706275	GX1230 / 451551
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Tripod / -
Antenna height:	0.000 m	0.405 m
Coordinates:		
X:	4633239.945 m	4628201.583 m
Y:	1014881.696 m	1033705.922 m
Z:	4250252.138 m	4250994.919 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:05:52 - 05/10/2019 07:51:07		
Duration:	45' 15"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -5038.361 m	dY: 18824.226 m	dZ: 742.781 m
	Slope: 19500.982 m	dHgt: -136.375 m	
Number of used satellites:	GPS: 8 GLONASS: -		

OLGIATA - IGM144903	**Reference: OLGIATA**	**Rover: IGM144903**
Receiver type / S/N:	LEICAGR30 / 1706275	GX1230GG / 467941
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 GG Pole / -
Antenna height:	0.000 m	2.300 m
Coordinates:		
X:	4633239.945 m	4628732.413 m
Y:	1014881.696 m	1036178.841 m
Z:	4250252.138 m	4250005.181 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 09:16:32 - 05/10/2019 10:17:07		
Duration:	1h 00' 35"		
Quality:	Sd. X: 0.002 m	Sd. Y: 0.001 m	Sd. Z: 0.002 m
	Posn. Qlty: 0.002 m	Hgt. Qlty: 0.002 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -4507.532 m	dY: 21297.144 m	dZ: -246.957 m
	Slope: 21770.328 m	dHgt: -14.108 m	
Number of used satellites:	GPS: 7 GLONASS: -		

OLGIATA - CS04	**Reference: OLGIATA**	**Rover: CS04**
Receiver type / S/N:	LEICAGR30 / 1706275	GX1230 / 451551
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Tripod / -
Antenna height:	0.000 m	1.066 m
Coordinates:		
X:	4633239.945 m	4628738.453 m
Y:	1014881.696 m	1032902.122 m
Z:	4250252.138 m	4250607.370 m

Solution type:	Phase: all fix

GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 08:05:07 - 05/10/2019 08:50:32		
Duration:	45' 25"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -4501.492 m	dY: 18020.425 m	dZ: 355.233 m
	Slope: 18577.550 m	dHgt: -137.029 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

OLGIATA - A-CS01	**Reference: OLGIATA**	**Rover: A-CS01**
Receiver type / S/N:	LEICAGR30 / 1706275	GX1230 / 451551
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Tripod / -
Antenna height:	0.000 m	1.127 m
Coordinates:		
X:	4633239.945 m	4628731.871 m
Y:	1014881.696 m	1032917.982 m
Z:	4250252.138 m	4250610.582 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 08:57:27 - 05/10/2019 09:43:02		
Duration:	45' 35"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.002 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -4508.074 m	dY: 18036.286 m	dZ: 358.445 m
	Slope: 18594.591 m	dHgt: -137.082 m	
Number of used satellites:	GPS: 7		
	GLONASS: -		

OLGIATA - CS09	**Reference: OLGIATA**	**Rover: CS09**
Receiver type / S/N:	LEICAGR30 / 1706275	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4629847.769 m
Y:	1014881.696 m	1031385.360 m
Z:	4250252.138 m	4249772.731 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:00:57 - 05/10/2019 07:46:52		
Duration:	45' 55"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -3392.176 m	dY: 16503.664 m	dZ: -479.407 m
	Slope: 16855.492 m	dHgt: -137.257 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

OLGIATA - CS08	**Reference: OLGIATA**	**Rover: CS08**
Receiver type / S/N:	LEICAGR30 / 1706275	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4630029.381 m
Y:	1014881.696 m	1032177.844 m
Z:	4250252.138 m	4249385.022 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:58:47 - 05/10/2019 08:44:47		
Duration:	46' 00"		
Quality:	Sd. X: 0.002 m	Sd. Y: 0.001 m	Sd. Z: 0.002 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.002 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -3210.564 m	dY: 17296.147 m	dZ: -867.116 m
	Slope: 17612.959 m	dHgt: -137.285 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

OLGIATA - CS07	**Reference: OLGIATA**	**Rover: CS07**
Receiver type / S/N:	LEICAGR30 / 1706275	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4629221.983 m
Y:	1014881.696 m	1031890.339 m
Z:	4250252.138 m	4250328.932 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 08:56:32 - 05/10/2019 09:42:37		
Duration:	46' 05"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -4017.961 m	dY: 17008.643 m	dZ: 76.794 m
	Slope: 17476.952 m	dHgt: -136.681 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

OLGIATA - CS06	**Reference: OLGIATA**	**Rover: CS06**
Receiver type / S/N:	LEICAGR30 / 1706275	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4629345.381 m
Y:	1014881.696 m	1032646.119 m
Z:	4250252.138 m	4250015.014 m

Solution type:	Phase: all fix
GNSS type:	GPS
Frequency:	IonoFree (L3)

Ambiguity:	Yes		
Time span:	05/10/2019 09:49:27 - 05/10/2019 10:35:57		
Duration:	46' 30"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -3894.564 m	dY: 17764.422 m	dZ: -237.123 m
	Slope: 18187.868 m	dHgt: -135.395 m	
Number of used satellites:	GPS: 10		
	GLONASS: -		

OLGIATA - ABT024	**Reference: OLGIATA**	**Rover: ABT024**
Receiver type / S/N:	LEICAGR30 / 1706275	Unknown / -
Antenna type / S/N:	LEIAR10 NONE / -	GS18 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4629512.506 m
Y:	1014881.696 m	1028914.517 m
Z:	4250252.138 m	4250731.070 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	L1 and L2		
Ambiguity:	Yes		
Time span:	05/10/2019 11:45:17 - 05/10/2019 12:35:22		
Duration:	50' 05"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.000 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -3727.439 m	dY: 14032.821 m	dZ: 478.933 m
	Slope: 14527.327 m	dHgt: -136.765 m	
Number of used satellites:	GPS: 9		
	GLONASS: -		

OLGIATA - CS03	**Reference: OLGIATA**	**Rover: CS03**
Receiver type / S/N:	LEICAGR30 / 1706275	GX1230 / 456303
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4628139.704 m
Y:	1014881.696 m	1033304.335 m
Z:	4250252.138 m	4251159.821 m

Solution type:	Phase: all fix		
GNSS type:	GPS		
Frequency:	IonoFree (L3)		
Ambiguity:	Yes		
Time span:	05/10/2019 07:02:02 - 05/10/2019 07:53:02		
Duration:	51' 00"		
Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -5100.241 m	dY: 18422.639 m	dZ: 907.683 m
	Slope: 19137.136 m	dHgt: -135.701 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

OLGIATA - CS02	**Reference: OLGIATA**	**Rover: CS02**

Receiver type / S/N:	LEICAGR30 / 1706275	GX1230 / 456303
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4628442.807 m
Y:	1014881.696 m	1033625.393 m
Z:	4250252.138 m	4250754.238 m
Solution type:	Phase: all fix	
GNSS type:	GPS	
Frequency:	IonoFree (L3)	
Ambiguity:	Yes	
Time span:	05/10/2019 08:09:37 - 05/10/2019 09:00:02	
Duration:	50' 25"	

Quality:	Sd. X: 0.001 m	Sd. Y: 0.000 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.001 m	Hgt. Qlty: 0.001 m	Sd. Slope: 0.000 m
Baseline vector:	dX: -4797.138 m	dY: 18743.697 m	dZ: 502.100 m
	Slope: 19354.348 m	dHgt: -135.871 m	
Number of used satellites:	GPS: 8		
	GLONASS: -		

OLGIATA - CS05	**Reference: OLGIATA**	**Rover: CS05**
Receiver type / S/N:	LEICAGR30 / 1706275	GX1230 / 456303
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4629053.548 m
Y:	1014881.696 m	1032546.166 m
Z:	4250252.138 m	4250351.970 m
Solution type:	Phase: all fix	
GNSS type:	GPS	
Frequency:	IonoFree (L3)	
Ambiguity:	Yes	
Time span:	05/10/2019 09:21:42 - 05/10/2019 10:10:27	
Duration:	48' 45"	

Quality:	Sd. X: 0.002 m	Sd. Y: 0.001 m	Sd. Z: 0.001 m
	Posn. Qlty: 0.002 m	Hgt. Qlty: 0.003 m	Sd. Slope: 0.001 m
Baseline vector:	dX: -4186.397 m	dY: 17664.469 m	dZ: 99.833 m
	Slope: 18154.045 m	dHgt: -137.334 m	
Number of used satellites:	GPS: 7		
	GLONASS: -		

OLGIATA - ABT25	**Reference: OLGIATA**	**Rover: ABT25**
Receiver type / S/N:	LEICAGR30 / 1706275	GX1230 / 456303
Antenna type / S/N:	LEIAR10 NONE / -	AX1202 Pole / -
Antenna height:	0.000 m	2.000 m
Coordinates:		
X:	4633239.945 m	4626265.344 m
Y:	1014881.696 m	1034001.201 m
Z:	4250252.138 m	4253019.635 m
Solution type:	Phase: all fix	
GNSS type:	GPS	
Frequency:	IonoFree (L3)	
Ambiguity:	Yes	
Time span:	05/10/2019 10:47:57 - 05/10/2019 11:38:57	

Duration:	51' 00"		
Quality:	Sd. X: 0.001 m Posn. Qlty: 0.001 m	Sd. Y: 0.000 m Hgt. Qlty: 0.001 m	Sd. Z: 0.001 m Sd. Slope: 0.000 m
Baseline vector:	dX: -6974.601 m Slope: 20539.220 m	dY: 19119.505 m dHgt: -134.344 m	dZ: 2767.498 m
Number of used satellites:	GPS: 8 GLONASS: -		

ALLEGATO 3
ADJUSTMENT

- when it has to be right

Network Adjustment

www.MOVE3.com

Created: 05/14/2019 17:21:08

Project Information

Project name:	LSR0055SIN-Monterotondo-100519-STAT-01
Date created:	05/13/2019 14:58:09
Time zone:	1h 00'
Coordinate system name:	WGS 1984
Application software:	LEICA Geo Office 7.0
Processing kernel:	MOVE3 4.0.1

General Information

Adjustment

Type:	Constrained	
Dimension:	3D	
Coordinate system:	WGS 1984	
Height mode:	Ellipsoidal	
Number of iterations:	1	
Maximum coord correction in last iteration:	0.000 m	✓ (tolerance is met)

Stations

Number of (partly) known stations:	3
Number of unknown stations:	14
Total:	17

Observations

GPS coordinate differences:	123 (41 baselines)
Known coordinates:	8
Total:	131

Unknowns

Coordinates:	51
Total:	51
Degrees of freedom:	80

Testing

Alfa (multi dimensional):	0.6048	
Alfa 0 (one dimensional):	5.0 %	
Beta:	80.0 %	
Sigma a-priori (GPS):	10.0	
Critical value W-test:	1.96	
Critical value T-test (2-dimensional):	2.42	
Critical value T-test (3-dimensional):	1.89	
Critical value F-test:	0.95	
F-test:	3.76	⚠ (rejected)

Results based on a-posteriori variance factor

Input data

Approximate Coordinates

Station	Latitude	Longitude	Height [m]	
A-CS01	42° 03' 36.39423" N	12° 34' 46.73335" E	70.804	
ABT024	42° 03' 41.64500" N	12° 31' 49.39570" E	71.116	
ABT25	42° 05' 21.50215" N	12° 35' 56.10958" E	73.549	
CS01	42° 03' 53.15148" N	12° 35' 25.20555" E	71.525	
CS02	42° 03' 42.62990" N	12° 35' 19.50064" E	72.035	
CS03	42° 04' 00.33119" N	12° 35' 08.74460" E	72.206	
CS04	42° 03' 36.25237" N	12° 34' 45.99789" E	70.882	
CS05	42° 03' 25.11215" N	12° 34' 27.90484" E	70.582	
CS06	42° 03' 10.34753" N	12° 34' 29.38377" E	72.499	
CS07	42° 03' 24.08795" N	12° 33' 58.47199" E	71.205	
CS08	42° 02' 42.90635" N	12° 34' 03.03567" E	70.620	
CS09	42° 02' 59.82688" N	12° 33' 31.11820" E	70.639	
IGM144903	42° 03' 06.37344" N	12° 37' 05.12441" E	193.800	
IGM150904	41° 59' 28.50868" N	12° 37' 23.87107" E	136.289	
MONTEROTONDO	42° 03' 09.07986" N	12° 37' 08.55737" E	201.573	Known in Position and Height
OLGIATA	42° 03' 16.73930" N	12° 21' 18.51040" E	207.855	Known in Position
ROMA UNI	41° 53' 35.19870" N	12° 29' 35.71690" E	120.584	Known in Position and Height

Adjustment Results

Coordinates

Station		Coordinate	Corr	Sd
A-CS01	Latitude	42° 03' 36.39423" N	0.000 m	0.003 m
	Longitude	12° 34' 46.73335" E	0.000 m	0.002 m
	Height	70.808 m	0.004 m	0.009 m
ABT024	Latitude	42° 03' 41.64500" N	0.000 m	0.003 m
	Longitude	12° 31' 49.39569" E	0.000 m	0.002 m
	Height	71.128 m	0.012 m	0.007 m
ABT25	Latitude	42° 05' 21.50215" N	0.000 m	0.004 m
	Longitude	12° 35' 56.10958" E	0.000 m	0.003 m
	Height	73.558 m	0.009 m	0.008 m
CS01	Latitude	42° 03' 53.15148" N	0.000 m	0.003 m
	Longitude	12° 35' 25.20555" E	0.000 m	0.002 m
	Height	71.529 m	0.004 m	0.005 m
CS02	Latitude	42° 03' 42.62990" N	0.000 m	0.003 m
	Longitude	12° 35' 19.50064" E	0.000 m	0.002 m
	Height	72.039 m	0.004 m	0.006 m
CS03	Latitude	42° 04' 00.33119" N	0.000 m	0.003 m
	Longitude	12° 35' 08.74460" E	0.000 m	0.002 m
	Height	72.210 m	0.004 m	0.005 m
CS04	Latitude	42° 03' 36.25237" N	0.000 m	0.003 m
	Longitude	12° 34' 45.99789" E	0.000 m	0.002 m
	Height	70.886 m	0.004 m	0.006 m
CS05	Latitude	42° 03' 25.11215" N	0.000 m	0.007 m
	Longitude	12° 34' 27.90484" E	0.000 m	0.007 m
	Height	70.587 m	0.005 m	0.017 m
CS06	Latitude	42° 03' 10.34753" N	0.000 m	0.005 m
	Longitude	12° 34' 29.38377" E	0.000 m	0.005 m
	Height	72.506 m	0.007 m	0.009 m
CS07	Latitude	42° 03' 24.08795" N	0.000 m	0.002 m
	Longitude	12° 33' 58.47199" E	0.000 m	0.002 m
	Height	71.210 m	0.006 m	0.008 m
CS08	Latitude	42° 02' 42.90635" N	0.000 m	0.007 m
	Longitude	12° 34' 03.03567" E	0.000 m	0.005 m
	Height	70.624 m	0.005 m	0.015 m
CS09	Latitude	42° 02' 59.82688" N	0.000 m	0.004 m

	Longitude	12° 33' 31.11820" E	0.000 m	0.002 m	
	Height	70.643 m	0.004 m	0.005 m	
IGM144903	Latitude	42° 03' 06.37265" N	-0.024 m	0.017 m	
	Longitude	12° 37' 05.12464" E	0.005 m	0.013 m	
	Height	193.789 m	-0.011 m	0.035 m	
IGM150904	Latitude	41° 59' 28.50868" N	0.000 m	0.006 m	
	Longitude	12° 37' 23.87107" E	0.000 m	0.003 m	
	Height	136.296 m	0.007 m	0.009 m	
MONTEROTONDO	Latitude	42° 03' 09.07986" N	0.000 m	-	fixed
	Longitude	12° 37' 08.55737" E	0.000 m	-	fixed
	Height	201.573 m	0.000 m	-	fixed
OLGIATA	Latitude	42° 03' 16.73930" N	0.000 m	-	fixed
	Longitude	12° 21' 18.51040" E	0.000 m	-	fixed
	Height	207.900 m	0.045 m	0.005 m	
ROMA UNI	Latitude	41° 53' 35.19870" N	0.000 m	-	fixed
	Longitude	12° 29' 35.71690" E	0.000 m	-	fixed
	Height	120.584 m	0.000 m	-	fixed

Observations and Residuals

	Station	Target	Adj obs	Resid	Resid (ENH)	Sd
DX	ROMA UNI	IGM150904	-9445.119 m	-0.034 m	0.012 m	0.007 m
DY			8944.422 m	0.005 m	0.024 m	0.004 m
DZ			8118.898 m	0.003 m	-0.022 m	0.007 m
DX	ROMA UNI	IGM144903	-13700.320 m	-0.003 m	0.009 m	0.027 m
DY			7549.681 m	0.008 m	0.002 m	0.018 m
DZ			13151.194 m	0.001 m	-0.001 m	0.025 m
DX	ROMA UNI	CS09	-12584.957 m	-0.026 m	0.004 m	0.005 m
DY			2756.195 m	-0.001 m	0.012 m	0.002 m
DZ			12918.742 m	-0.007 m	-0.024 m	0.004 m
DX	ROMA UNI	CS08	-12403.344 m	-0.017 m	0.001 m	0.011 m
DY			3548.685 m	-0.003 m	0.001 m	0.006 m
DZ			12531.045 m	-0.014 m	-0.023 m	0.012 m
DX	ROMA UNI	CS07	-13210.754 m	-0.031 m	0.004 m	0.007 m
DY			3261.175 m	-0.003 m	0.004 m	0.003 m
DZ			13474.943 m	-0.023 m	-0.039 m	0.005 m
DX	ROMA UNI	CS06	-13087.342 m	-0.022 m	0.004 m	0.007 m
DY			4016.956 m	-0.001 m	0.006 m	0.005 m
DZ			13161.025 m	-0.012 m	-0.025 m	0.006 m
DX	ROMA UNI	CS05	-13379.158 m	-0.039 m	-0.002 m	0.014 m
DY			3917.020 m	-0.011 m	0.012 m	0.009 m
DZ			13497.989 m	-0.020 m	-0.043 m	0.010 m
DX	ROMA UNI	CS04	-13694.262 m	-0.026 m	0.000 m	0.004 m
DY			4272.965 m	-0.005 m	0.008 m	0.002 m
DZ			13753.391 m	-0.013 m	-0.029 m	0.005 m
DX	ROMA UNI	CS03	-14293.011 m	-0.035 m	0.007 m	0.005 m
DY			4675.170 m	-0.001 m	0.014 m	0.002 m
DZ			14305.837 m	-0.012 m	-0.034 m	0.003 m
DX	ROMA UNI	CS02	-13989.912 m	-0.024 m	0.001 m	0.004 m
DY			4996.234 m	-0.005 m	0.006 m	0.002 m
DZ			13900.255 m	-0.013 m	-0.027 m	0.005 m
DX	ROMA UNI	CS01	-14231.132 m	-0.036 m	0.005 m	0.004 m
DY			5076.757 m	-0.002 m	0.022 m	0.002 m
DZ			14140.925 m	-0.002 m	-0.028 m	0.003 m
DX	ROMA UNI	ABT25	-16167.384 m	-0.029 m	-0.005 m	0.007 m
DY			5372.037 m	-0.012 m	0.010 m	0.003 m
DZ			16165.653 m	-0.013 m	-0.032 m	0.005 m
DX	ROMA UNI	ABT024	-12920.231 m	-0.021 m	0.004 m	0.006 m
DY			285.356 m	-0.001 m	0.001 m	0.002 m
DZ			13877.084 m	-0.017 m	-0.026 m	0.005 m
DX	ROMA UNI	A-CS01	-13700.863 m	-0.034 m	0.004 m	0.007 m
DY			4288.818 m	-0.003 m	0.010 m	0.004 m
DZ			13756.588 m	-0.016 m	-0.036 m	0.005 m

DX	OLGIATA	IGM150904	-252.336 m	-0.014 m	0.000 m	0.008 m
DY			22691.893 m	-0.004 m	0.014 m	0.004 m
DZ			-5279.253 m	0.006 m	-0.007 m	0.008 m
DX	OLGIATA	IGM144903	-4507.537 m	0.005 m	-0.008 m	0.027 m
DY			21297.152 m	-0.007 m	-0.002 m	0.018 m
DZ			-246.957 m	0.001 m	0.003 m	0.025 m
DX	OLGIATA	CS09	-3392.175 m	-0.002 m	-0.002 m	0.006 m
DY			16503.665 m	-0.002 m	0.004 m	0.003 m
DZ			-479.410 m	0.003 m	0.000 m	0.005 m
DX	OLGIATA	CS08	-3210.562 m	-0.003 m	-0.007 m	0.011 m
DY			17296.156 m	-0.008 m	-0.004 m	0.006 m
DZ			-867.106 m	-0.010 m	-0.010 m	0.012 m
DX	OLGIATA	CS07	-4017.971 m	0.010 m	-0.005 m	0.007 m
DY			17008.646 m	-0.003 m	-0.004 m	0.003 m
DZ			76.791 m	0.003 m	0.008 m	0.006 m
DX	OLGIATA	CS06	-3894.560 m	-0.004 m	-0.003 m	0.008 m
DY			17764.427 m	-0.004 m	0.006 m	0.005 m
DZ			-237.127 m	0.004 m	-0.001 m	0.007 m
DX	OLGIATA	CS05	-4186.376 m	-0.021 m	-0.016 m	0.015 m
DY			17664.491 m	-0.021 m	0.013 m	0.009 m
DZ			99.837 m	-0.005 m	-0.022 m	0.010 m
DX	OLGIATA	CS04	-4501.479 m	-0.013 m	-0.008 m	0.006 m
DY			18020.436 m	-0.011 m	0.005 m	0.002 m
DZ			355.239 m	-0.007 m	-0.016 m	0.006 m
DX	OLGIATA	CS03	-5100.228 m	-0.013 m	0.000 m	0.006 m
DY			18422.641 m	-0.002 m	0.007 m	0.002 m
DZ			907.686 m	-0.002 m	-0.011 m	0.005 m
DX	OLGIATA	CS02	-4797.129 m	-0.008 m	-0.006 m	0.006 m
DY			18743.705 m	-0.008 m	0.004 m	0.002 m
DZ			502.104 m	-0.003 m	-0.010 m	0.006 m
DX	OLGIATA	CS01	-5038.350 m	-0.012 m	0.001 m	0.006 m
DY			18824.228 m	-0.002 m	0.013 m	0.002 m
DZ			742.774 m	0.007 m	-0.004 m	0.005 m
DX	OLGIATA	ABT25	-6974.601 m	0.000 m	-0.003 m	0.008 m
DY			19119.508 m	-0.003 m	-0.002 m	0.003 m
DZ			2767.501 m	-0.003 m	-0.003 m	0.006 m
DX	OLGIATA	ABT024	-3727.448 m	0.010 m	-0.008 m	0.007 m
DY			14032.827 m	-0.006 m	-0.006 m	0.002 m
DZ			478.933 m	0.000 m	0.006 m	0.006 m
DX	OLGIATA	A-CS01	-4508.081 m	0.007 m	-0.004 m	0.008 m
DY			18036.289 m	-0.003 m	0.002 m	0.004 m
DZ			358.436 m	0.008 m	0.010 m	0.006 m
DX	MONTEROTONDO	IGM150904	4321.403 m	0.009 m	-0.002 m	0.007 m
DY			1328.668 m	0.000 m	-0.007 m	0.004 m
DZ			-5099.535 m	-0.002 m	0.005 m	0.007 m
DX	MONTEROTONDO	CS09	1181.565 m	0.003 m	0.000 m	0.005 m
DY			-4859.559 m	0.000 m	-0.002 m	0.002 m
DZ			-299.691 m	0.000 m	0.002 m	0.004 m
DX	MONTEROTONDO	CS08	1363.177 m	0.003 m	0.001 m	0.011 m
DY			-4067.069 m	0.002 m	0.000 m	0.006 m
DZ			-687.388 m	0.003 m	0.004 m	0.012 m
DX	MONTEROTONDO	CS07	555.768 m	0.003 m	0.000 m	0.007 m
DY			-4354.578 m	0.001 m	0.000 m	0.003 m
DZ			256.510 m	0.003 m	0.004 m	0.005 m
DX	MONTEROTONDO	CS06	679.179 m	0.008 m	-0.001 m	0.007 m
DY			-3598.798 m	0.001 m	-0.003 m	0.005 m
DZ			-57.408 m	0.003 m	0.008 m	0.006 m
DX	MONTEROTONDO	CS05	387.364 m	0.009 m	0.003 m	0.014 m
DY			-3698.733 m	0.005 m	-0.004 m	0.009 m
DZ			279.556 m	0.004 m	0.009 m	0.010 m
DX	MONTEROTONDO	CS04	72.260 m	0.004 m	0.001 m	0.004 m
DY			-3342.788 m	0.002 m	-0.001 m	0.002 m
DZ			534.958 m	0.002 m	0.005 m	0.005 m

	MONTEROTONDO	CS03	-526.489 m	0.006 m	-0.001 m	0.005 m
DY			-2940.583 m	0.000 m	-0.002 m	0.002 m
DZ			1087.404 m	0.002 m	0.005 m	0.003 m
DX	MONTEROTONDO	CS02	-223.390 m	0.006 m	0.001 m	0.004 m
DY			-2619.519 m	0.002 m	-0.002 m	0.002 m
DZ			681.822 m	0.003 m	0.007 m	0.005 m
DX	MONTEROTONDO	CS01	-464.611 m	0.004 m	-0.001 m	0.004 m
DY			-2538.996 m	0.000 m	-0.003 m	0.002 m
DZ			922.492 m	-0.001 m	0.003 m	0.003 m
DX	MONTEROTONDO	ABT25	-2400.862 m	0.008 m	0.003 m	0.007 m
DY			-2243.716 m	0.004 m	-0.002 m	0.003 m
DZ			2947.220 m	0.005 m	0.010 m	0.005 m
DX	MONTEROTONDO	ABT024	846.291 m	0.001 m	0.003 m	0.006 m
DY			-7330.397 m	0.003 m	0.002 m	0.002 m
DZ			658.651 m	0.005 m	0.004 m	0.005 m
DX	MONTEROTONDO	A-CS01	65.658 m	0.003 m	0.000 m	0.007 m
DY			-3326.935 m	0.001 m	-0.001 m	0.004 m
DZ			538.155 m	0.001 m	0.003 m	0.005 m

GPS Baseline Vector Residuals

	Station	Target	Adj vector [m]	Resid [m]	Resid [ppm]
DV	ROMA UNI	IGM150904	15333.932	0.035	2.3
DV	ROMA UNI	IGM144903	20436.496	0.009	0.4
DV	ROMA UNI	CS09	18244.770	0.027	1.5
DV	ROMA UNI	CS08	17985.083	0.023	1.3
DV	ROMA UNI	CS07	19150.284	0.039	2.0
DV	ROMA UNI	CS06	18990.183	0.026	1.3
DV	ROMA UNI	CS05	19404.655	0.045	2.3
DV	ROMA UNI	CS04	19873.268	0.030	1.5
DV	ROMA UNI	CS03	20755.827	0.037	1.8
DV	ROMA UNI	CS02	20344.461	0.028	1.4
DV	ROMA UNI	CS01	20694.549	0.036	1.7
DV	ROMA UNI	ABT25	23485.558	0.034	1.4
DV	ROMA UNI	ABT024	18962.786	0.027	1.4
DV	ROMA UNI	A-CS01	19883.444	0.037	1.9
DV	OLGIATA	IGM150904	23299.274	0.016	0.7
DV	OLGIATA	IGM144903	21770.336	0.009	0.4
DV	OLGIATA	CS09	16855.493	0.004	0.2
DV	OLGIATA	CS08	17612.966	0.013	0.7
DV	OLGIATA	CS07	17476.957	0.010	0.6
DV	OLGIATA	CS06	18187.872	0.007	0.4
DV	OLGIATA	CS05	18154.061	0.030	1.7
DV	OLGIATA	CS04	18577.557	0.018	1.0
DV	OLGIATA	CS03	19137.135	0.013	0.7
DV	OLGIATA	CS02	19354.354	0.012	0.6
DV	OLGIATA	CS01	19500.980	0.014	0.7
DV	OLGIATA	ABT25	20539.224	0.005	0.2
DV	OLGIATA	ABT024	14527.335	0.011	0.8
DV	OLGIATA	A-CS01	18594.596	0.011	0.6
DV	MONTEROTONDO	IGM150904	6815.067	0.009	1.3
DV	MONTEROTONDO	CS09	5010.112	0.003	0.6
DV	MONTEROTONDO	CS08	4344.169	0.004	1.0
DV	MONTEROTONDO	CS07	4397.389	0.004	0.9
DV	MONTEROTONDO	CS06	3662.775	0.009	2.4
DV	MONTEROTONDO	CS05	3729.454	0.011	2.8
DV	MONTEROTONDO	CS04	3386.094	0.005	1.5
DV	MONTEROTONDO	CS03	3179.098	0.006	1.8
DV	MONTEROTONDO	CS02	2716.002	0.007	2.6
DV	MONTEROTONDO	CS01	2741.050	0.004	1.5
DV	MONTEROTONDO	ABT25	4414.126	0.010	2.3
DV	MONTEROTONDO	ABT024	7408.425	0.006	0.8
DV	MONTEROTONDO	A-CS01	3370.819	0.003	0.9