

Surveyor's Report

Project: DEL-229-0.21

PID: 107754



Scope: Bridge repair

Type:

Gray boxes denote *INPUT*

Tan boxes denote *OUTPUT* (check)

Datum and Coordinate System

Coordinate System:	Ohio State Plane, North Zone
Horizontal Reference Datum:	NAD83 (2011)
Ellipsoid:	GRS80
Grid to Ground Multiplier (1/CSF):	1.00003871 Factor is 8 decimal places per Survey & Mapping Specifications.
Origin of Combined Scale Factor:	(0,0)
Vertical Reference Datum:	NAVD88
Geoid Model:	Geoid 18
Units:	US Survey Feet (sft)
Original Survey Subdivision:	United States Military Lands
Township:	Marlboro Twp., Twp. 6, Range 19
Quarter Section/Section/Lot:	Quarter Township 1

Files

Description

References

Alignment based on the following plan: DEL-229-0-1.1 and DEL-229-1.1/1.32

Other references used:

DEL_23_17.48

Equipment Maintenance

Equipment maintenance logs are on file at the Ohio Department of Transportation, Central Office

Methodology and Equipment Used

ODOT VRS for project control; combination of RTK GPS, Total Station, terrestrial scanning, and sonar for topography.

GPS Antenna Used



Report Submitted/Prepared by: Brian D. Smart, P.S.

Date Submitted: 7/13/2022

Surveying Performed by: Smart Services, Inc.

Surveying Performed by:

Checked By:

Brian D. Smart, P.S.

DGN Overview Map

Insert close-up screen shot of combined DGN here

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP01		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP01	5/24/2022	9:47:14 AM	280061.01000	1808739.35200	945.40800	0.00812	0.00963	-0.03487	<input checked="" type="checkbox"/>
2	CP01	5/24/2022	9:49:57 AM	280061.00200	1808739.35900	945.35800	0.01612	0.00263	0.01513	<input checked="" type="checkbox"/>
3	CP01	5/24/2022	9:54:15 AM	280061.03300	1808739.37800	945.43600	0.00000	0.00000	0.00000	<input type="checkbox"/>
4	CP01	5/24/2022	9:56:05 AM	280061.04700	1808739.39400	945.40600	0.00000	0.00000	0.00000	<input type="checkbox"/>
5	CP01	5/24/2022	9:59:24 AM	280061.03900	1808739.38400	945.38000	-0.02088	-0.02237	-0.00687	<input checked="" type="checkbox"/>
6	CP01	5/24/2022	9:59:52 AM	280061.05800	1808739.42100	945.43000	0.00000	0.00000	0.00000	<input type="checkbox"/>
7	CP01	5/26/2022	9:36:05 AM	280061.01800	1808739.34600	945.34600	0.00012	0.01563	0.02713	<input checked="" type="checkbox"/>
8	CP01	5/26/2022	9:37:04 AM	280061.03800	1808739.37200	945.37200	-0.01988	-0.01037	0.00113	<input checked="" type="checkbox"/>
9	CP01	5/26/2022	9:42:03 AM	280061.01800	1808739.38100	945.42500	0.00000	0.00000	0.00000	<input type="checkbox"/>
10	CP01	5/26/2022	9:46:15 AM	280061.02100	1808739.34000	945.34200	-0.00288	0.02163	0.03113	<input checked="" type="checkbox"/>
11	CP01	5/26/2022	9:51:28 AM	280061.04100	1808739.36700	945.39900	-0.02288	-0.00537	-0.02587	<input checked="" type="checkbox"/>
12	CP01	5/26/2022	9:52:22 AM	280060.97600	1808739.37300	945.38000	0.04212	-0.01137	-0.00687	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	280061.01813	1808739.36163	945.37313	RMSE:	RMSE:	RMSE:
				0.02081	0.01404	0.02212
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280061.0181	1808739.3616	945.373

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280061.0181	1808739.3616	945.373	CNPT
U.S. Survey FT (GROUND)	280071.8593	1808809.3779	945.373	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 10°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP02		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP02	5/26/2022	11:02:45 AM	280085.22600	1809096.22700	946.43800	-0.00758	-0.02292	-0.00175	<input checked="" type="checkbox"/>
2	CP02	5/26/2022	11:04:58 AM	280085.21200	1809096.23500	946.44300	0.00642	-0.03092	-0.00675	<input checked="" type="checkbox"/>
3	CP02	5/26/2022	11:07:49 AM	280085.23100	1809096.21600	946.41000	-0.01258	-0.01192	0.02625	<input checked="" type="checkbox"/>
4	CP02	5/26/2022	11:11:07 AM	280085.21700	1809096.19700	946.40500	0.00142	0.00708	0.03125	<input checked="" type="checkbox"/>
5	CP02	5/26/2022	11:12:23 AM	280085.23400	1809096.19500	946.44400	-0.01558	0.00908	-0.00775	<input checked="" type="checkbox"/>
6	CP02	5/26/2022	11:15:29 AM	280085.22100	1809096.19800	946.45100	-0.00258	0.00608	-0.01475	<input checked="" type="checkbox"/>
7	CP02	5/26/2022	11:17:39 AM	280085.22500	1809096.20600	946.40900	-0.00658	-0.00192	0.02725	<input checked="" type="checkbox"/>
8	CP02	5/26/2022	10:12:09 AM	280085.20900	1809096.21200	946.42000	0.00942	-0.00792	0.01625	<input checked="" type="checkbox"/>
9	CP02	5/26/2022	10:16:41 AM	280085.21800	1809096.21600	946.45800	0.00042	-0.01192	-0.02175	<input checked="" type="checkbox"/>
10	CP02	5/26/2022	10:17:42 AM	280085.23200	1809096.18800	946.47500	-0.01358	0.01608	-0.03875	<input checked="" type="checkbox"/>
11	CP02	5/26/2022	10:22:39 AM	280085.19100	1809096.17800	946.44900	0.02742	0.02608	-0.01275	<input checked="" type="checkbox"/>
12	CP02	5/26/2022	10:24:08 AM	280085.20500	1809096.18100	946.43300	0.01342	0.02308	0.00325	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	280085.21842	1809096.20408	946.43625	RMSE:	RMSE:	RMSE:
				0.01210	0.01701	0.02071
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280085.2184	1809096.2041	946.436

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280085.2184	1809096.2041	946.436	CNPT
U.S. Survey FT (GROUND)	280096.0605	1809166.2342	946.436	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: **10°**

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP03		No. of Sessions: 14	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP03	5/23/2022	1:39:40 PM	279997.76300	1809599.33600	950.38200	-0.00412	-0.02162	-0.00400	<input checked="" type="checkbox"/>
2	CP03	5/23/2022	1:50:20 PM	279997.73600	1809599.30100	950.38600	0.02288	0.01338	-0.00800	<input checked="" type="checkbox"/>
3	CP03	5/23/2022	1:55:55 PM	279997.77100	1809599.31000	950.40300	0.00000	0.00000	0.00000	<input type="checkbox"/>
4	CP03	5/23/2022	1:58:33 PM	279997.75300	1809599.30800	950.38100	0.00587	0.00638	-0.00300	<input checked="" type="checkbox"/>
5	CP03	5/23/2022	2:11:13 PM	279997.76100	1809599.30700	950.40000	0.00000	0.00000	0.00000	<input type="checkbox"/>
6	CP03	5/23/2022	2:13:59 PM	279997.76300	1809599.30000	950.40900	0.00000	0.00000	0.00000	<input type="checkbox"/>
7	CP03	5/26/2022	10:42:19 AM	279997.78300	1809599.31200	950.37500	-0.02412	0.00238	0.00300	<input checked="" type="checkbox"/>
8	CP03	5/26/2022	10:45:25 AM	279997.80100	1809599.33300	950.40600	0.00000	0.00000	0.00000	<input type="checkbox"/>
9	CP03	5/26/2022	10:46:42 AM	279997.78400	1809599.33700	950.38700	-0.02512	-0.02262	-0.00900	<input checked="" type="checkbox"/>
10	CP03	5/26/2022	10:50:14 AM	279997.74500	1809599.31700	950.41400	0.00000	0.00000	0.00000	<input type="checkbox"/>
11	CP03	5/26/2022	10:51:39 AM	279997.77400	1809599.31900	950.35800	-0.01512	-0.00462	0.02000	<input checked="" type="checkbox"/>
12	CP03	5/26/2022	10:54:26 AM	279997.76300	1809599.31700	950.37700	-0.00412	-0.00262	0.00100	<input checked="" type="checkbox"/>
13	CP03	5/26/2022	10:56:34 AM	279997.71600	1809599.29600	950.40000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	CP03	5/26/2022	10:58:19 AM	279997.71500	1809599.28500	950.37800	0.04387	0.02938	0.00000	<input checked="" type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	279997.75888	1809599.31438	950.37800	RMSE:	RMSE:	RMSE:
				0.02225	0.01619	0.00851
				RMSE IN U.S. Survey FT:		
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	279997.7589	1809599.3144	950.378

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	279997.7589	1809599.3144	950.378	CNPT
U.S. Survey FT (GROUND)	280008.5976	1809669.3640	950.378	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.
 Mask Angle: 10°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP04		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP04	5/23/2022	2:19:00 PM	279990.10300	1810168.83900	944.69900	-0.00211	0.00778	0.05578	<input checked="" type="checkbox"/>
2	CP04	5/23/2022	2:21:51 PM	279990.11300	1810168.83200	944.68800	-0.01211	0.01478	0.06678	<input checked="" type="checkbox"/>
3	CP04	5/23/2022	2:23:51 PM	279990.08700	1810168.80800	944.83500	0.00000	0.00000	0.00000	<input type="checkbox"/>
4	CP04	5/23/2022	2:25:39 PM	279990.09400	1810168.90400	944.75000	0.00689	-0.05722	0.00478	<input checked="" type="checkbox"/>
5	CP04	5/23/2022	2:27:33 PM	279990.05300	1810168.84200	944.78400	0.04789	0.00478	-0.02922	<input checked="" type="checkbox"/>
6	CP04	5/23/2022	2:29:52 PM	279990.05100	1810168.84600	944.91400	0.00000	0.00000	0.00000	<input type="checkbox"/>
7	CP04	5/23/2022	2:34:07 PM	279990.09800	1810168.85900	944.77800	0.00289	-0.01222	-0.02322	<input checked="" type="checkbox"/>
8	CP04	5/23/2022	2:35:12 PM	279990.10800	1810168.84400	944.81000	-0.00711	0.00278	-0.05522	<input checked="" type="checkbox"/>
9	CP04	5/23/2022	2:37:19 PM	279990.11400	1810168.80100	944.78100	-0.01311	0.04578	-0.02622	<input checked="" type="checkbox"/>
10	CP04	5/23/2022	2:40:38 PM	279990.08900	1810168.88200	944.90800	0.00000	0.00000	0.00000	<input type="checkbox"/>
11	CP04	5/23/2022	2:46:22 PM	279990.09400	1810168.85400	944.75600	0.00689	-0.00722	-0.00122	<input checked="" type="checkbox"/>
12	CP04	5/23/2022	2:47:02 PM	279990.13100	1810168.84600	944.74700	-0.03011	0.00078	0.00778	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	279990.10089	1810168.84678	944.75478	RMSE:	RMSE:	RMSE:
				RMSE IN U.S. Survey FT:	0.02021	0.02556
				Tolerance:	0.02900	0.03900
					PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	279990.1009	1810168.8468	944.755

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	279990.1009	1810168.8468	944.755	CNPT
U.S. Survey FT (GROUND)	280000.9393	1810238.9184	944.755	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: **10°**

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP05		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP05	5/24/2022	9:07:58 AM	279953.52200	1810660.88400	937.63600	0.00317	0.01025	0.03175	<input checked="" type="checkbox"/>
2	CP05	5/24/2022	9:09:18 AM	279953.55400	1810660.89800	937.64700	-0.02883	-0.00375	0.02075	<input checked="" type="checkbox"/>
3	CP05	5/24/2022	9:12:32 AM	279953.52700	1810660.90800	937.63200	-0.00183	-0.01375	0.03575	<input checked="" type="checkbox"/>
4	CP05	5/24/2022	9:14:20 AM	279953.52700	1810660.90200	937.60800	-0.00183	-0.00775	0.05975	<input checked="" type="checkbox"/>
5	CP05	5/24/2022	9:16:07 AM	279953.52300	1810660.89900	937.65300	0.00217	-0.00475	0.01475	<input checked="" type="checkbox"/>
6	CP05	5/24/2022	9:16:32 AM	279953.49500	1810660.90000	937.68200	0.03017	-0.00575	-0.01425	<input checked="" type="checkbox"/>
7	CP05	5/24/2022	9:19:14 AM	279953.50700	1810660.88000	937.68700	0.01817	0.01425	-0.01925	<input checked="" type="checkbox"/>
8	CP05	5/24/2022	9:19:40 AM	279953.54300	1810660.87300	937.69100	-0.01783	0.02125	-0.02325	<input checked="" type="checkbox"/>
9	CP05	5/24/2022	9:22:25 AM	279953.52900	1810660.88100	937.67600	-0.00383	0.01325	-0.00825	<input checked="" type="checkbox"/>
10	CP05	5/24/2022	9:24:09 AM	279953.51800	1810660.90100	937.71900	0.00717	-0.00675	-0.05125	<input checked="" type="checkbox"/>
11	CP05	5/24/2022	9:24:45 AM	279953.50900	1810660.91600	937.72800	0.01617	-0.02175	-0.06025	<input checked="" type="checkbox"/>
12	CP05	5/24/2022	9:26:45 AM	279953.54800	1810660.88900	937.65400	-0.02283	0.00525	0.01375	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	279953.52517	1810660.89425	937.66775	RMSE:	RMSE:	RMSE:
				0.01648	0.01225	0.03432
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	279953.5252	1810660.8943	937.668

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	279953.5252	1810660.8943	937.668	CNPT
U.S. Survey FT (GROUND)	279964.3622	1810730.9849	937.668	CNPT

Notes:

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 10°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP06		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP06	6/6/2022	10:05:04 AM	280289.43000	1812098.41300	934.26400	-0.01250	0.03150	0.01630	<input checked="" type="checkbox"/>
2	CP06	6/6/2022	10:05:55 AM	280289.39700	1812098.45200	934.17900	0.00000	0.00000	0.00000	<input type="checkbox"/>
3	CP06	6/6/2022	10:11:11 AM	280289.43100	1812098.46500	934.14900	0.00000	0.00000	0.00000	<input type="checkbox"/>
4	CP06	6/6/2022	10:13:46 AM	280289.45100	1812098.47200	934.26400	-0.03350	-0.02750	0.01630	<input checked="" type="checkbox"/>
5	CP06	6/6/2022	10:16:35 AM	280289.43000	1812098.46800	934.28700	-0.01250	-0.02350	-0.00670	<input checked="" type="checkbox"/>
6	CP06	6/6/2022	10:18:00 AM	280289.40300	1812098.42000	934.22500	0.01450	0.02450	0.05530	<input checked="" type="checkbox"/>
7	CP06	6/6/2022	10:20:20 AM	280289.40200	1812098.43000	934.29700	0.01550	0.01450	-0.01670	<input checked="" type="checkbox"/>
8	CP06	6/6/2022	10:25:05 AM	280289.40300	1812098.43100	934.33400	0.01450	0.01350	-0.05370	<input checked="" type="checkbox"/>
9	CP06	6/6/2022	10:27:38 AM	280289.42600	1812098.44600	934.31000	-0.00850	-0.00150	-0.02970	<input checked="" type="checkbox"/>
10	CP06	6/6/2022	10:30:22 AM	280289.40300	1812098.44200	934.26400	0.01450	0.00250	0.01630	<input checked="" type="checkbox"/>
11	CP06	6/6/2022	10:32:43 AM	280289.40200	1812098.44600	934.28500	0.01550	-0.00150	-0.00470	<input checked="" type="checkbox"/>
12	CP06	6/6/2022	10:35:26 AM	280289.42500	1812098.47700	934.27300	-0.00750	-0.03250	0.00730	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	280289.41750	1812098.44450	934.28030	RMSE:	RMSE:	RMSE:
				0.01635	0.02088	0.02832
				RMSE IN U.S. Survey FT:		
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280289.4175	1812098.4445	934.280

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280289.4175	1812098.4445	934.280	CNPT
U.S. Survey FT (GROUND)	280300.2675	1812168.5908	934.280	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.
 Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP07		No. of Sessions: 12		(GRID)				
Checked By: Brian D. Smart, P.S.								

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP07	5/31/2022	1:16:23 PM	280362.10200	1812595.10900	934.24800	-0.01110	-0.02130	-0.00510	<input checked="" type="checkbox"/>
2	CP07	5/31/2022	1:19:40 PM	280362.09600	1812595.08400	934.23200	-0.00510	0.00370	0.01090	<input checked="" type="checkbox"/>
3	CP07	5/31/2022	1:20:34 PM	280362.09700	1812595.08000	934.20400	-0.00610	0.00770	0.03890	<input checked="" type="checkbox"/>
4	CP07	5/31/2022	1:23:47 PM	280362.10700	1812595.09500	934.20800	-0.01610	-0.00730	0.03490	<input checked="" type="checkbox"/>
5	CP07	5/31/2022	1:27:58 PM	280362.05800	1812595.12100	934.38300	0.00000	0.00000	0.00000	<input type="checkbox"/>
6	CP07	5/31/2022	1:30:32 PM	280362.06900	1812595.10900	934.31400	0.00000	0.00000	0.00000	<input type="checkbox"/>
7	CP07	5/31/2022	1:31:24 PM	280362.09100	1812595.11500	934.30800	-0.00010	-0.02730	-0.06510	<input checked="" type="checkbox"/>
8	CP07	5/31/2022	1:34:04 PM	280362.10300	1812595.10700	934.28000	-0.01210	-0.01930	-0.03710	<input checked="" type="checkbox"/>
9	CP07	5/31/2022	1:38:49 PM	280362.03700	1812595.06700	934.25700	0.05390	0.02070	-0.01410	<input checked="" type="checkbox"/>
10	CP07	5/31/2022	1:39:24 PM	280362.08500	1812595.09000	934.29100	0.00590	-0.00230	-0.04810	<input checked="" type="checkbox"/>
11	CP07	5/31/2022	1:42:18 PM	280362.11100	1812595.07500	934.18700	-0.02010	0.01270	0.05590	<input checked="" type="checkbox"/>
12	CP07	5/31/2022	1:44:26 PM	280362.08000	1812595.05500	934.21400	0.01090	0.03270	0.02890	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	280362.09090	1812595.08770	934.24290	RMSE:	RMSE:	RMSE:
				0.02014	0.01834	0.03868
				RMSE IN U.S. Survey FT:		
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280362.0909	1812595.0877	934.243

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280362.0909	1812595.0877	934.243	CNPT
U.S. Survey FT (GROUND)	280372.9437	1812665.2533	934.243	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.
 Mask Angle: 10°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP08		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP08	6/6/2022	11:16:50 AM	280429.17700	1813150.85200	937.82000	-0.01350	0.00542	0.03658	<input checked="" type="checkbox"/>
2	CP08	6/6/2022	11:19:19 AM	280429.19000	1813150.85100	937.78200	-0.02650	0.00642	0.07458	<input checked="" type="checkbox"/>
3	CP08	6/6/2022	11:22:11 AM	280429.16400	1813150.85500	937.87300	-0.00050	0.00242	-0.01642	<input checked="" type="checkbox"/>
4	CP08	6/6/2022	11:22:48 AM	280429.17500	1813150.86900	937.86500	-0.01150	-0.01158	-0.00842	<input checked="" type="checkbox"/>
5	CP08	6/6/2022	11:26:38 AM	280429.14900	1813150.86600	937.81700	0.01450	-0.00858	0.03958	<input checked="" type="checkbox"/>
6	CP08	6/6/2022	11:27:45 AM	280429.16100	1813150.87700	937.85600	0.00250	-0.01958	0.00058	<input checked="" type="checkbox"/>
7	CP08	6/6/2022	11:30:37 AM	280429.19100	1813150.84100	937.89900	-0.02750	0.01642	-0.04242	<input checked="" type="checkbox"/>
8	CP08	6/6/2022	11:35:24 AM	280429.15900	1813150.86800	937.80700	0.00450	-0.01058	0.04958	<input checked="" type="checkbox"/>
9	CP08	6/6/2022	11:37:30 AM	280429.14300	1813150.85100	937.88400	0.02050	0.00642	-0.02742	<input checked="" type="checkbox"/>
10	CP08	6/6/2022	11:38:45 AM	280429.16300	1813150.85400	937.88500	0.00050	0.00342	-0.02842	<input checked="" type="checkbox"/>
11	CP08	6/6/2022	11:42:01 AM	280429.15200	1813150.84800	937.90800	0.01150	0.00942	-0.05142	<input checked="" type="checkbox"/>
12	CP08	6/6/2022	11:43:45 AM	280429.13800	1813150.85700	937.88300	0.02550	0.00042	-0.02642	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	280429.16350	1813150.85742	937.85658	RMSE:	RMSE:	RMSE:
				0.01636	0.00996	0.03869
				Tolerance: 0.02900		
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280429.1635	1813150.8574	937.857

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280429.1635	1813150.8574	937.857	CNPT
U.S. Survey FT (GROUND)	280440.0189	1813221.0445	937.857	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP09		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP09	6/6/2022	11:49:32 AM	280453.86000	1813530.11100	944.25400	-0.01192	-0.00117	-0.00892	<input checked="" type="checkbox"/>
2	CP09	6/6/2022	11:50:19 AM	280453.85400	1813530.11300	944.26900	-0.00592	-0.00317	-0.02392	<input checked="" type="checkbox"/>
3	CP09	6/6/2022	11:54:28 AM	280453.84200	1813530.10900	944.25400	0.00608	0.00083	-0.00892	<input checked="" type="checkbox"/>
4	CP09	6/6/2022	11:55:06 AM	280453.82800	1813530.09700	944.25100	0.02008	0.01283	-0.00592	<input checked="" type="checkbox"/>
5	CP09	6/6/2022	11:58:32 AM	280453.86200	1813530.08900	944.25000	-0.01392	0.02083	-0.00492	<input checked="" type="checkbox"/>
6	CP09	6/6/2022	12:01:22 PM	280453.83900	1813530.10700	944.21300	0.00908	0.00283	0.03208	<input checked="" type="checkbox"/>
7	CP09	6/6/2022	12:04:09 PM	280453.84800	1813530.12800	944.23200	0.00008	-0.01817	0.01308	<input checked="" type="checkbox"/>
8	CP09	6/6/2022	12:06:32 PM	280453.86000	1813530.12500	944.23400	-0.01192	-0.01517	0.01108	<input checked="" type="checkbox"/>
9	CP09	6/6/2022	12:09:45 PM	280453.84500	1813530.10700	944.25100	0.00308	0.00283	-0.00592	<input checked="" type="checkbox"/>
10	CP09	6/6/2022	12:12:16 PM	280453.84100	1813530.09700	944.22900	0.00708	0.01283	0.01608	<input checked="" type="checkbox"/>
11	CP09	6/6/2022	12:13:54 PM	280453.85000	1813530.11400	944.26100	-0.00192	-0.00417	-0.01592	<input checked="" type="checkbox"/>
12	CP09	6/6/2022	12:16:11 PM	280453.84800	1813530.12100	944.24300	0.00008	-0.01117	0.00208	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	280453.84808	1813530.10983	944.24508	RMSE:	RMSE:	RMSE:
				RMSE IN U.S. Survey FT:	0.00957	0.01116
				Tolerance:	0.02900	0.03900
					PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280453.8481	1813530.1098	944.245

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280453.8481	1813530.1098	944.245	CNPT
U.S. Survey FT (GROUND)	280464.7045	1813600.3116	944.245	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.
 Mask Angle: **20°**

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP10		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP10	6/6/2022	12:57:44 PM	280350.29200	1815113.49800	937.51300	0.01292	0.02175	-0.00242	<input checked="" type="checkbox"/>
2	CP10	6/6/2022	1:01:31 PM	280350.27800	1815113.51900	937.51100	0.02692	0.00075	-0.00042	<input checked="" type="checkbox"/>
3	CP10	6/6/2022	1:02:09 PM	280350.29700	1815113.53500	937.47400	0.00792	-0.01525	0.03658	<input checked="" type="checkbox"/>
4	CP10	6/6/2022	1:06:28 PM	280350.28700	1815113.51100	937.54100	0.01792	0.00875	-0.03042	<input checked="" type="checkbox"/>
5	CP10	6/6/2022	1:09:18 PM	280350.30300	1815113.52900	937.53400	0.00192	-0.00925	-0.02342	<input checked="" type="checkbox"/>
6	CP10	6/6/2022	1:11:39 PM	280350.30200	1815113.53000	937.52200	0.00292	-0.01025	-0.01142	<input checked="" type="checkbox"/>
7	CP10	6/6/2022	1:14:02 PM	280350.33900	1815113.51600	937.55100	-0.03408	0.00375	-0.04042	<input checked="" type="checkbox"/>
8	CP10	6/6/2022	1:16:11 PM	280350.32000	1815113.51700	937.50900	-0.01508	0.00275	0.00158	<input checked="" type="checkbox"/>
9	CP10	6/6/2022	1:18:29 PM	280350.31200	1815113.52900	937.49600	-0.00708	-0.00925	0.01458	<input checked="" type="checkbox"/>
10	CP10	6/6/2022	1:19:07 PM	280350.31100	1815113.51900	937.49300	-0.00608	0.00075	0.01758	<input checked="" type="checkbox"/>
11	CP10	6/6/2022	1:22:46 PM	280350.30300	1815113.51600	937.51600	0.00192	0.00375	-0.00542	<input checked="" type="checkbox"/>
12	CP10	6/6/2022	1:24:49 PM	280350.31500	1815113.51800	937.46700	-0.01008	0.00175	0.04358	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	280350.30492	1815113.51975	937.51058	RMSE:	RMSE:	RMSE:
				0.01546	0.00957	0.02421
				Tolerance: 0.02900		0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280350.3049	1815113.5198	937.511

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION = N/A sft		

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280350.3049	1815113.5198	937.511	CNPT
U.S. Survey FT (GROUND)	280361.1573	1815183.7828	937.511	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: **20°**

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP11		No. of Sessions: 16	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP11	6/6/2022	1:41:39 PM	280209.78500	1815495.02800	934.91800	0.01158	-0.01675	0.04625	<input checked="" type="checkbox"/>
2	CP11	6/6/2022	1:44:56 PM	280209.78800	1815495.04300	934.93700	0.00858	-0.03175	0.02725	<input checked="" type="checkbox"/>
3	CP11	6/6/2022	1:47:03 PM	280209.76900	1815495.04000	934.95100	0.02758	-0.02875	0.01325	<input checked="" type="checkbox"/>
4	CP11	6/6/2022	1:47:39 PM	280209.79800	1815495.00400	934.94600	-0.00142	0.00725	0.01825	<input checked="" type="checkbox"/>
5	CP11	6/6/2022	1:50:55 PM	280209.83200	1815495.00000	934.94800	-0.03542	0.01125	0.01625	<input checked="" type="checkbox"/>
6	CP11	6/6/2022	1:52:03 PM	280209.80100	1815495.03600	934.98200	-0.00442	-0.02475	-0.01775	<input checked="" type="checkbox"/>
7	CP11	6/6/2022	1:55:58 PM	280209.78400	1815495.02700	934.96100	0.01258	-0.01575	0.00325	<input checked="" type="checkbox"/>
8	CP11	6/6/2022	1:56:45 PM	280209.82700	1815494.98800	935.01900	-0.03042	0.02325	-0.05475	<input checked="" type="checkbox"/>
9	CP11	6/6/2022	2:00:28 PM	280209.82900	1815494.96800	934.98800	-0.03242	0.04325	-0.02375	<input checked="" type="checkbox"/>
10	CP11	6/6/2022	2:02:40 PM	280209.79300	1815494.97300	934.93900	0.00358	0.03825	0.02525	<input checked="" type="checkbox"/>
11	CP11	6/6/2022	2:03:28 PM	280209.84800	1815494.91100	935.12900	0.00000	0.00000	0.00000	<input type="checkbox"/>
12	CP11	6/6/2022	2:07:15 PM	280209.83400	1815494.90800	935.23300	0.00000	0.00000	0.00000	<input type="checkbox"/>
13	CP11	6/6/2022	2:09:19 PM	280209.76700	1815494.94100	935.26300	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	CP11	6/6/2022	2:11:22 PM	280209.79900	1815494.99900	935.03700	-0.00242	0.01225	-0.07275	<input checked="" type="checkbox"/>
15	CP11	6/6/2022	2:13:33 PM	280209.75400	1815495.02900	934.94500	0.04258	-0.01775	0.01925	<input checked="" type="checkbox"/>

AVERAGE	280209.79658	1815495.01125	934.96425	RMSE:	RMSE:	RMSE:
				0.02275	0.02499	0.03396
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280209.7966	1815495.0113	934.964

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280209.7966	1815495.0113	934.964	CNPT
U.S. Survey FT (GROUND)	280220.6435	1815565.2891	934.964	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP12		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP12	6/7/2022	9:44:43 AM	280039.06000	1815762.94900	934.20200	-0.01100	-0.02640	0.04910	<input checked="" type="checkbox"/>
2	CP12	6/7/2022	9:50:42 AM	280039.06600	1815762.92400	934.28400	-0.01700	-0.00140	-0.03290	<input checked="" type="checkbox"/>
3	CP12	6/7/2022	9:54:28 AM	280039.06400	1815762.93100	934.23900	-0.01500	-0.00840	0.01210	<input checked="" type="checkbox"/>
4	CP12	6/7/2022	9:55:13 AM	280039.07600	1815763.00200	934.25600	0.00000	0.00000	0.00000	<input type="checkbox"/>
5	CP12	6/7/2022	10:01:43 AM	280039.06300	1815762.90800	934.25200	-0.01400	0.01460	-0.00090	<input checked="" type="checkbox"/>
6	CP12	6/7/2022	10:05:46 AM	280039.03800	1815762.86500	934.22600	0.01100	0.05760	0.02510	<input checked="" type="checkbox"/>
7	CP12	6/7/2022	10:06:43 AM	280039.04900	1815762.90800	934.25700	0.00000	0.01460	-0.00590	<input checked="" type="checkbox"/>
8	CP12	6/7/2022	10:13:58 AM	280039.05600	1815762.91900	934.31400	-0.00700	0.00360	-0.06290	<input checked="" type="checkbox"/>
9	CP12	6/7/2022	10:15:56 AM	280039.03100	1815762.91900	934.28700	0.01800	0.00360	-0.03590	<input checked="" type="checkbox"/>
10	CP12	6/7/2022	10:21:45 AM	280038.98300	1815762.90900	934.43900	0.00000	0.00000	0.00000	<input type="checkbox"/>
11	CP12	6/7/2022	10:23:46 AM	280039.02300	1815762.94000	934.22400	0.02600	-0.01740	0.02710	<input checked="" type="checkbox"/>
12	CP12	6/7/2022	10:30:39 AM	280039.04000	1815762.96300	934.22600	0.00900	-0.04040	0.02510	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	280039.04900	1815762.92260	934.25110	RMSE:	RMSE:	RMSE:
				0.01443	0.02544	0.03304
				RMSE IN U.S. Survey FT:		
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	280039.0490	1815762.9226	934.251

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	280039.0490	1815762.9226	934.251	CNPT
U.S. Survey FT (GROUND)	280049.8893	1815833.2108	934.251	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP13		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP13	6/7/2022	10:36:04 AM	279702.13800	1816078.88400	932.78400	0.02850	-0.01800	-0.02250	<input checked="" type="checkbox"/>
2	CP13	6/7/2022	10:36:51 AM	279702.19200	1816078.83800	932.70100	-0.02550	0.02800	0.06050	<input checked="" type="checkbox"/>
3	CP13	6/7/2022	10:41:20 AM	279702.15900	1816078.85100	932.73800	0.00750	0.01500	0.02350	<input checked="" type="checkbox"/>
4	CP13	6/7/2022	10:44:00 AM	279702.14100	1816078.85900	932.75600	0.02550	0.00700	0.00550	<input checked="" type="checkbox"/>
5	CP13	6/7/2022	10:44:42 AM	279702.16200	1816078.87100	932.71700	0.00450	-0.00500	0.04450	<input checked="" type="checkbox"/>
6	CP13	6/7/2022	10:47:22 AM	279702.15500	1816078.87100	932.76100	0.01150	-0.00500	0.00050	<input checked="" type="checkbox"/>
7	CP13	6/7/2022	10:51:49 AM	279702.15800	1816078.86900	932.83700	0.00850	-0.00300	-0.07550	<input checked="" type="checkbox"/>
8	CP13	6/7/2022	10:54:25 AM	279702.16200	1816078.87300	932.81600	0.00450	-0.00700	-0.05450	<input checked="" type="checkbox"/>
9	CP13	6/7/2022	10:55:03 AM	279702.18100	1816078.87700	932.75600	-0.01450	-0.01100	0.00550	<input checked="" type="checkbox"/>
10	CP13	6/7/2022	10:59:12 AM	279702.17400	1816078.86900	932.74800	-0.00750	-0.00300	0.01350	<input checked="" type="checkbox"/>
11	CP13	6/7/2022	11:01:36 AM	279702.17500	1816078.87000	932.77400	-0.00850	-0.00400	-0.01250	<input checked="" type="checkbox"/>
12	CP13	6/7/2022	11:04:37 AM	279702.20100	1816078.86000	932.75000	-0.03450	0.00600	0.01150	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	279702.16650	1816078.86600	932.76150	RMSE:	RMSE:	RMSE:
				0.01813	0.01180	0.03640
				Tolerance: 0.02900		
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	279702.1665	1816078.8660	932.762

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION = N/A sft		

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	279702.1665	1816078.8660	932.762	CNPT
U.S. Survey FT (GROUND)	279712.9938	1816149.1664	932.762	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.
 Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP14		No. of Sessions: 16	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP14	6/21/2022	9:36:41 AM	279184.23000	1816647.43700	941.47000	0.03833	0.01667	-0.04725	<input checked="" type="checkbox"/>
2	CP14	6/21/2022	9:40:39 AM	279184.21500	1816647.45200	941.47600	0.00000	0.00000	0.00000	<input type="checkbox"/>
3	CP14	6/21/2022	9:44:10 AM	279184.23200	1816647.43700	941.47500	0.03633	0.01667	-0.05225	<input checked="" type="checkbox"/>
4	CP14	6/21/2022	9:47:40 AM	279184.22200	1816647.43500	941.46100	0.04633	0.01867	-0.03825	<input checked="" type="checkbox"/>
5	CP14	6/21/2022	9:50:36 AM	279184.23400	1816647.45300	941.47900	0.03433	0.00067	-0.05625	<input checked="" type="checkbox"/>
6	CP14	6/21/2022	9:53:40 AM	279184.28400	1816647.46000	941.43600	-0.01567	-0.00633	-0.01325	<input checked="" type="checkbox"/>
7	CP14	6/21/2022	9:57:01 AM	279184.30400	1816647.47000	941.37600	-0.03567	-0.01633	0.04675	<input checked="" type="checkbox"/>
8	CP14	6/21/2022	10:00:24 AM	279184.27600	1816647.44700	941.39800	-0.00767	0.00667	0.02475	<input checked="" type="checkbox"/>
9	CP14	6/21/2022	10:03:17 AM	279184.28700	1816647.46400	941.42100	-0.01867	-0.01033	0.00175	<input checked="" type="checkbox"/>
10	CP14	6/21/2022	10:06:31 AM	279184.28400	1816647.46800	941.39100	-0.01567	-0.01433	0.03175	<input checked="" type="checkbox"/>
11	CP14	6/21/2022	10:09:35 AM	279184.30100	1816647.45800	941.31600	0.00000	0.00000	0.00000	<input type="checkbox"/>
12	CP14	6/21/2022	10:12:53 AM	279184.29800	1816647.47200	941.30200	0.00000	0.00000	0.00000	<input type="checkbox"/>
13	CP14	6/21/2022	10:16:02 AM	279184.28600	1816647.44800	941.38400	-0.01767	0.00567	0.03875	<input checked="" type="checkbox"/>
14	CP14	6/21/2022	10:19:05 AM	279184.29000	1816647.44800	941.39000	-0.02167	0.00567	0.03275	<input checked="" type="checkbox"/>
15	CP14	6/21/2022	10:21:59 AM	279184.29100	1816647.47700	941.39200	-0.02267	-0.02333	0.03075	<input checked="" type="checkbox"/>

AVERAGE	279184.26833	1816647.45367	941.42275	RMSE:	RMSE:	RMSE:
				0.02826	0.01347	0.03774
				RMSE IN U.S. Survey FT:		
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	279184.2683	1816647.4537	941.423

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	279184.2683	1816647.4537	941.423	CNPT
U.S. Survey FT (GROUND)	279195.0756	1816717.7761	941.423	CNPT

Notes:

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 10°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP15		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP15	6/7/2022	12:04:59 PM	277376.83900	1818682.44900	948.33400	-0.00650	0.03458	0.01108	<input checked="" type="checkbox"/>
2	CP15	6/7/2022	12:08:33 PM	277376.83300	1818682.48900	948.31400	-0.00050	-0.00542	0.03108	<input checked="" type="checkbox"/>
3	CP15	6/7/2022	12:11:16 PM	277376.80200	1818682.48100	948.35000	0.03050	0.00258	-0.00492	<input checked="" type="checkbox"/>
4	CP15	6/7/2022	12:14:14 PM	277376.82500	1818682.50400	948.34300	0.00750	-0.02042	0.00208	<input checked="" type="checkbox"/>
5	CP15	6/7/2022	12:19:50 PM	277376.83500	1818682.48900	948.37100	-0.00250	-0.00542	-0.02592	<input checked="" type="checkbox"/>
6	CP15	6/7/2022	12:22:48 PM	277376.84600	1818682.48600	948.32500	-0.01350	-0.00242	0.02008	<input checked="" type="checkbox"/>
7	CP15	6/7/2022	12:24:33 PM	277376.84600	1818682.49800	948.37200	-0.01350	-0.01442	-0.02692	<input checked="" type="checkbox"/>
8	CP15	6/7/2022	12:27:17 PM	277376.83500	1818682.46500	948.33000	-0.00250	0.01858	0.01508	<input checked="" type="checkbox"/>
9	CP15	6/7/2022	12:30:26 PM	277376.83000	1818682.46600	948.36600	0.00250	0.01758	-0.02092	<input checked="" type="checkbox"/>
10	CP15	6/7/2022	12:35:15 PM	277376.82700	1818682.49700	948.36500	0.00550	-0.01342	-0.01992	<input checked="" type="checkbox"/>
11	CP15	6/7/2022	12:37:08 PM	277376.83700	1818682.49700	948.34000	-0.00450	-0.01342	0.00508	<input checked="" type="checkbox"/>
12	CP15	6/7/2022	12:40:35 PM	277376.83500	1818682.48200	948.33100	-0.00250	0.00158	0.01408	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	277376.83250	1818682.48358	948.34508	RMSE:	RMSE:	RMSE:
				RMSE IN U.S. Survey FT: 0.01106	0.01557	0.01871
				Tolerance: 0.02900	0.03900	
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	277376.8325	1818682.4836	948.345

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	277376.8325	1818682.4836	948.345	CNPT
U.S. Survey FT (GROUND)	277387.5698	1818752.8848	948.345	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.
 Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP16		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP16	6/7/2022	12:44:45 PM	277185.39400	1818896.91700	949.71300	0.00100	0.03433	0.02644	<input checked="" type="checkbox"/>
2	CP16	6/7/2022	12:48:05 PM	277185.39000	1818896.95500	949.74500	0.00500	-0.00367	-0.00556	<input checked="" type="checkbox"/>
3	CP16	6/7/2022	12:53:50 PM	277185.39000	1818896.98000	949.76000	0.00500	-0.02867	-0.02056	<input checked="" type="checkbox"/>
4	CP16	6/7/2022	12:57:10 PM	277185.36600	1818896.99400	949.82800	0.00000	0.00000	0.00000	<input type="checkbox"/>
5	CP16	6/7/2022	12:57:59 PM	277185.36300	1818896.96000	949.76500	0.03200	-0.00867	-0.02556	<input checked="" type="checkbox"/>
6	CP16	6/7/2022	1:03:35 PM	277185.38400	1818896.94800	949.82900	0.00000	0.00000	0.00000	<input type="checkbox"/>
7	CP16	6/7/2022	1:05:26 PM	277185.38500	1818896.94600	949.84200	0.00000	0.00000	0.00000	<input type="checkbox"/>
8	CP16	6/7/2022	1:08:13 PM	277185.38900	1818896.97400	949.76900	0.00600	-0.02267	-0.02956	<input checked="" type="checkbox"/>
9	CP16	6/7/2022	1:13:56 PM	277185.37500	1818896.95600	949.71000	0.02000	-0.00467	0.02944	<input checked="" type="checkbox"/>
10	CP16	6/7/2022	1:15:31 PM	277185.40400	1818896.94800	949.69800	-0.00900	0.00333	0.04144	<input checked="" type="checkbox"/>
11	CP16	6/7/2022	1:20:32 PM	277185.40300	1818896.91800	949.70400	-0.00800	0.03333	0.03544	<input checked="" type="checkbox"/>
12	CP16	6/7/2022	1:21:25 PM	277185.44700	1818896.95400	949.79100	-0.05200	-0.00267	-0.05156	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	277185.39500	1818896.95133	949.73944	RMSE:	RMSE:	RMSE:
				RMSE IN U.S. Survey FT:	0.02201	0.02042
				Tolerance:	0.02900	0.03193
					PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	277185.3950	1818896.9513	949.739

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	277185.3950	1818896.9513	949.739	CNPT
U.S. Survey FT (GROUND)	277196.1248	1818967.3608	949.739	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21		GPS Antenna: 0		Report Date: 7/13/2022	
PID: 107754		VRS Network: ODOT VRS		Prepared By: Brian D. Smart, P.S.	
Point ID: CP17	No. of Sessions: 16	(GRID)		Checked By: Brian D. Smart, P.S.	

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP17	6/21/2022	10:53:13 AM	275049.63800	1821242.56200	957.09600	-0.01260	-0.01220	0.00530	<input checked="" type="checkbox"/>
2	CP17	6/21/2022	10:56:39 AM	275049.64400	1821242.53700	957.09800	-0.01860	0.01280	0.00330	<input checked="" type="checkbox"/>
3	CP17	6/21/2022	10:59:38 AM	275049.64100	1821242.54800	957.15400	-0.01560	0.00180	-0.05270	<input checked="" type="checkbox"/>
4	CP17	6/21/2022	11:02:48 AM	275049.62100	1821242.50800	957.03500	0.00440	0.04180	0.06630	<input checked="" type="checkbox"/>
5	CP17	6/21/2022	11:05:27 AM	275049.63700	1821242.49400	956.91700	0.00000	0.00000	0.00000	<input type="checkbox"/>
6	CP17	6/21/2022	11:08:00 AM	275049.60000	1821242.53700	957.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
7	CP17	6/21/2022	11:11:17 AM	275049.61600	1821242.59500	957.15100	0.00940	-0.04520	-0.04970	<input checked="" type="checkbox"/>
8	CP17	6/21/2022	11:14:00 AM	275049.61800	1821242.58800	957.13800	0.00740	-0.03820	-0.03670	<input checked="" type="checkbox"/>
9	CP17	6/21/2022	11:17:05 AM	275049.62100	1821242.54500	957.09100	0.00440	0.00480	0.01030	<input checked="" type="checkbox"/>
10	CP17	6/21/2022	11:20:47 AM	275049.61900	1821242.52900	957.11800	0.00640	0.02080	-0.01670	<input checked="" type="checkbox"/>
11	CP17	6/21/2022	11:23:32 AM	275049.59500	1821242.53400	957.06300	0.03040	0.01580	0.03830	<input checked="" type="checkbox"/>
12	CP17	6/21/2022	11:26:29 AM	275049.60400	1821242.56800	957.00100	0.00000	0.00000	0.00000	<input type="checkbox"/>
13	CP17	6/21/2022	11:29:21 AM	275049.62000	1821242.56400	956.96000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	CP17	6/21/2022	11:31:57 AM	275049.64100	1821242.55200	957.06900	-0.01560	-0.00220	0.03230	<input checked="" type="checkbox"/>
15	CP17	6/21/2022	11:34:51 AM	275049.62700	1821242.55600	957.01100	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	275049.62540	1821242.54980	957.10130	RMSE:	RMSE:	RMSE:
				RMSE IN U.S. Survey FT: 0.01462	0.02505	0.03732
				Tolerance: 0.02900	0.03900	
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	275049.6254	1821242.5498	957.101

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	275049.6254	1821242.5498	957.101	CNPT
U.S. Survey FT (GROUND)	275060.2726	1821313.0501	957.101	CNPT

Notes:

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 10°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP18		No. of Sessions: 12	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP18	6/7/2022	1:41:41 PM	273762.37100	1822748.53800	945.82300	0.02456	-0.00967	0.05078	<input checked="" type="checkbox"/>
2	CP18	6/7/2022	1:46:00 PM	273762.39500	1822748.56200	945.88000	0.00056	-0.03367	-0.00622	<input checked="" type="checkbox"/>
3	CP18	6/7/2022	1:47:12 PM	273762.40900	1822748.53100	945.83500	-0.01344	-0.00267	0.03878	<input checked="" type="checkbox"/>
4	CP18	6/7/2022	1:48:49 PM	273762.38200	1822748.54900	945.91900	0.01356	-0.02067	-0.04522	<input checked="" type="checkbox"/>
5	CP18	6/7/2022	1:51:08 PM	273762.37200	1822748.55900	945.95300	0.00000	0.00000	0.00000	<input type="checkbox"/>
6	CP18	6/7/2022	1:53:44 PM	273762.36800	1822748.54500	945.95100	0.00000	0.00000	0.00000	<input type="checkbox"/>
7	CP18	6/7/2022	1:55:51 PM	273762.36400	1822748.51900	945.89900	0.03156	0.00933	-0.02522	<input checked="" type="checkbox"/>
8	CP18	6/7/2022	1:57:56 PM	273762.37200	1822748.53200	945.93300	0.02356	-0.00367	-0.05922	<input checked="" type="checkbox"/>
9	CP18	6/7/2022	2:00:29 PM	273762.40600	1822748.50000	945.84200	-0.01044	0.02833	0.03178	<input checked="" type="checkbox"/>
10	CP18	6/7/2022	2:03:39 PM	273762.43300	1822748.53200	945.80000	0.00000	0.00000	0.00000	<input type="checkbox"/>
11	CP18	6/7/2022	2:07:03 PM	273762.42100	1822748.52400	945.89100	-0.02544	0.00433	-0.01722	<input checked="" type="checkbox"/>
12	CP18	6/7/2022	2:07:45 PM	273762.44000	1822748.50000	945.84200	-0.04444	0.02833	0.03178	<input checked="" type="checkbox"/>
13	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
14	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>
15	0	1/0/1900	12:00:00 AM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	273762.39556	1822748.52833	945.87378	RMSE:	RMSE:	RMSE:
				0.02415	0.01940	0.03745
				RMSE IN U.S. Survey FT:		
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	273762.3956	1822748.5283	945.874

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	273762.3956	1822748.5283	945.874	CNPT
U.S. Survey FT (GROUND)	273772.9929	1822819.0869	945.874	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP19		No. of Sessions: 15	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP19	6/21/2022	1:41:16 PM	273430.93300	1823109.34400	935.42000	0.00000	0.00000	0.00000	<input type="checkbox"/>
2	CP19	6/21/2022	1:43:47 PM	273431.02300	1823109.40500	935.40500	0.04138	-0.00338	0.03650	<input checked="" type="checkbox"/>
3	CP19	6/21/2022	1:46:29 PM	273431.06700	1823109.39300	935.41100	-0.00262	0.00863	0.03050	<input checked="" type="checkbox"/>
4	CP19	6/21/2022	1:48:57 PM	273430.98000	1823109.34100	935.40600	0.00000	0.00000	0.00000	<input type="checkbox"/>
5	CP19	6/21/2022	1:51:17 PM	273431.12900	1823109.40300	935.41500	0.00000	0.00000	0.00000	<input type="checkbox"/>
6	CP19	6/21/2022	1:54:29 PM	273431.04700	1823109.41700	935.40100	0.01737	-0.01537	0.04050	<input checked="" type="checkbox"/>
7	CP19	6/21/2022	1:57:05 PM	273431.07100	1823109.41400	935.49100	-0.00662	-0.01238	-0.04950	<input checked="" type="checkbox"/>
8	CP19	6/21/2022	1:59:46 PM	273430.97700	1823109.43500	935.50100	0.00000	0.00000	0.00000	<input type="checkbox"/>
9	CP19	6/21/2022	2:03:13 PM	273431.05000	1823109.41100	935.44200	0.01438	-0.00938	-0.00050	<input checked="" type="checkbox"/>
10	CP19	6/21/2022	2:06:00 PM	273431.02100	1823109.38500	935.35900	0.00000	0.00000	0.00000	<input type="checkbox"/>
11	CP19	6/21/2022	2:08:48 PM	273431.08200	1823109.43200	935.43100	-0.01762	-0.03038	0.01050	<input checked="" type="checkbox"/>
12	CP19	6/21/2022	2:12:17 PM	273431.06500	1823109.44400	935.53900	0.00000	0.00000	0.00000	<input type="checkbox"/>
13	CP19	6/21/2022	2:15:04 PM	273431.07900	1823109.35200	935.46100	-0.01463	0.04962	-0.01950	<input checked="" type="checkbox"/>
14	CP19	6/21/2022	2:20:53 PM	273431.09600	1823109.38900	935.49000	-0.03163	0.01262	-0.04850	<input checked="" type="checkbox"/>
15	CP19	6/21/2022	2:24:04 PM	273431.06000	1823109.41000	935.50000	0.00000	0.00000	0.00000	<input type="checkbox"/>

AVERAGE	273431.06438	1823109.40163	935.44150	RMSE:	RMSE:	RMSE:
				RMSE IN U.S. Survey FT: 0.02329	0.02422	0.03625
				Tolerance: 0.02900	0.03900	
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	273431.0644	1823109.4016	935.442

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	273431.0644	1823109.4016	935.442	CNPT
U.S. Survey FT (GROUND)	273441.6489	1823179.9742	935.442	CNPT

Notes:

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 10°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022		
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.		
Point ID: CP20		No. of Sessions: 16	(GRID)			Checked By: Brian D. Smart, P.S.		

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP20	6/8/2022	10:16:49 AM	273356.02300	1823346.51100	932.69800	0.00000	0.00000	0.00000	<input type="checkbox"/>
2	CP20	6/8/2022	10:19:53 AM	273356.01100	1823346.60300	932.74700	0.00000	0.00000	0.00000	<input type="checkbox"/>
3	CP20	6/8/2022	10:27:54 AM	273356.06900	1823346.48100	932.74000	0.00000	0.00000	0.00000	<input type="checkbox"/>
4	CP20	6/8/2022	10:33:18 AM	273356.08500	1823346.55200	932.82400	-0.03988	-0.00250	-0.02212	<input checked="" type="checkbox"/>
5	CP20	6/8/2022	10:34:58 AM	273356.05500	1823346.53800	932.80000	-0.00987	0.01150	0.00188	<input checked="" type="checkbox"/>
6	CP20	6/8/2022	10:39:14 AM	273356.09800	1823346.54300	932.73000	0.00000	0.00000	0.00000	<input type="checkbox"/>
7	CP20	6/8/2022	10:44:33 AM	273356.11300	1823346.51200	932.71200	0.00000	0.00000	0.00000	<input type="checkbox"/>
8	CP20	6/8/2022	10:45:40 AM	273356.05700	1823346.55500	932.81800	-0.01187	-0.00550	-0.01612	<input checked="" type="checkbox"/>
9	CP20	6/8/2022	10:48:53 AM	273356.02200	1823346.57000	932.72900	0.02313	-0.02050	0.07288	<input checked="" type="checkbox"/>
10	CP20	6/8/2022	10:54:02 AM	273356.06200	1823346.53000	932.76100	-0.01687	0.01950	0.04088	<input checked="" type="checkbox"/>
11	CP20	6/8/2022	10:56:19 AM	273356.09800	1823346.53000	932.75500	0.00000	0.00000	0.00000	<input type="checkbox"/>
12	CP20	6/8/2022	10:58:13 AM	273356.10900	1823346.55900	932.74400	0.00000	0.00000	0.00000	<input type="checkbox"/>
13	CP20	6/8/2022	11:02:41 AM	273356.05800	1823346.51000	932.81500	-0.01288	0.03950	-0.01312	<input checked="" type="checkbox"/>
14	CP20	6/8/2022	11:05:13 AM	273356.01600	1823346.55900	932.84200	0.02913	-0.00950	-0.04012	<input checked="" type="checkbox"/>
15	CP20	6/8/2022	11:07:39 AM	273356.00600	1823346.58200	932.82600	0.03913	-0.03250	-0.02412	<input checked="" type="checkbox"/>
AVERAGE				273356.04513	1823346.54950	932.80188	RMSE:	RMSE:	RMSE:	
							RMSE IN U.S. Survey FT:	0.02724	0.02292	0.03798
							Tolerance:	0.02900	0.03900	
							PASS	PASS	PASS	

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	273356.0451	1823346.5495	932.802

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	273356.0451	1823346.5495	932.802	CNPT
U.S. Survey FT (GROUND)	273366.6267	1823417.1312	932.802	CNPT

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.
 Mask Angle: 20°

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21			GPS Antenna: 0			Report Date: 7/13/2022			
PID: 107754			VRS Network: ODOT VRS			Prepared By: Brian D. Smart, P.S.			
Point ID: CP21		No. of Sessions: 16		(GRID)					Checked By: Brian D. Smart, P.S.

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP21	6/8/2022	11:57:20 AM	273052.44400	1824019.09800	934.35700	0.02775	0.00912	-0.03300	<input checked="" type="checkbox"/>
2	CP21	6/8/2022	11:59:48 AM	273052.45300	1824019.11800	934.35900	0.01875	-0.01088	-0.03500	<input checked="" type="checkbox"/>
3	CP21	6/8/2022	12:05:41 PM	273052.43000	1824019.06600	934.41500	0.00000	0.00000	0.00000	<input type="checkbox"/>
4	CP21	6/8/2022	12:10:10 PM	273052.49600	1824019.17000	934.12500	0.00000	0.00000	0.00000	<input type="checkbox"/>
5	CP21	6/8/2022	12:14:56 PM	273052.51000	1824019.17300	934.18600	0.00000	0.00000	0.00000	<input type="checkbox"/>
6	CP21	6/8/2022	12:20:12 PM	273052.46300	1824019.12200	934.30600	0.00875	-0.01488	0.01800	<input checked="" type="checkbox"/>
7	CP21	6/8/2022	12:23:18 PM	273052.46500	1824019.12700	934.40400	0.00000	0.00000	0.00000	<input type="checkbox"/>
8	CP21	6/8/2022	12:26:31 PM	273052.49600	1824019.12400	934.31100	-0.02425	-0.01688	0.01300	<input checked="" type="checkbox"/>
9	CP21	6/8/2022	12:33:35 PM	273052.44400	1824019.08000	934.35500	0.02775	0.02712	-0.03100	<input checked="" type="checkbox"/>
10	CP21	6/8/2022	12:30:18 PM	273052.45700	1824019.07900	934.40900	0.00000	0.00000	0.00000	<input type="checkbox"/>
11	CP21	6/8/2022	12:38:08 PM	273052.37600	1824019.12600	934.35500	0.00000	0.00000	0.00000	<input type="checkbox"/>
12	CP21	6/8/2022	12:41:20 PM	273052.37200	1824019.14600	934.41500	0.00000	0.00000	0.00000	<input type="checkbox"/>
13	CP21	6/8/2022	12:42:56 PM	273052.46800	1824019.09800	934.35000	0.00375	0.00912	-0.02600	<input checked="" type="checkbox"/>
14	CP21	6/8/2022	12:48:11 PM	273052.51400	1824019.12800	934.24900	-0.04225	-0.02088	0.07500	<input checked="" type="checkbox"/>
15	CP21	6/8/2022	12:48:56 PM	273052.49200	1824019.08900	934.30500	-0.02025	0.01812	0.01900	<input checked="" type="checkbox"/>

AVERAGE		273052.47175	1824019.10713	934.32400	RMSE:	RMSE:	RMSE:
		RMSE IN U.S. Survey FT:			0.02441	0.01692	0.03611
		Tolerance:			0.02900	0.03900	
					PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	273052.4718	1824019.1071	934.324

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION = N/A sft		

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	273052.4718	1824019.1071	934.324	CNPT
U.S. Survey FT (GROUND)	273063.0416	1824089.7149	934.324	CNPT

Notes:

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: **20°**

VRS GNSS Project Control Monument Coordinate Analysis

Project: DEL-229-0.21		GPS Antenna: 0		Report Date: 7/13/2022	
PID: 107754		VRS Network: ODOT VRS		Prepared By: Brian D. Smart, P.S.	
Point ID: CP22	No. of Sessions: 16	(GRID)		Checked By: Brian D. Smart, P.S.	

SESSION #	Point	Observation Date	Start Time	Northing(sft)	Easting(sft)	Height(sft)	Δ Northing(sft)	Δ Easting(sft)	Δ Height(sft)	Include in Solution?
1	CP22	6/22/2022	9:32:38 AM	272930.30800	1825507.81200	954.31700	0.00000	0.00000	0.00000	<input type="checkbox"/>
2	CP22	6/22/2022	9:36:03 AM	272930.33000	1825507.80900	954.32700	-0.00938	-0.00387	0.02550	<input checked="" type="checkbox"/>
3	CP22	6/22/2022	9:38:54 AM	272930.31700	1825507.81300	954.36900	0.00363	-0.00788	-0.01650	<input checked="" type="checkbox"/>
4	CP22	6/22/2022	9:42:21 AM	272930.30700	1825507.87700	954.38000	0.00000	0.00000	0.00000	<input type="checkbox"/>
5	CP22	6/22/2022	9:45:28 AM	272930.30500	1825507.82500	954.26700	0.00000	0.00000	0.00000	<input type="checkbox"/>
6	CP22	6/22/2022	9:48:39 AM	272930.29800	1825507.81800	954.39900	0.02262	-0.01288	-0.04650	<input checked="" type="checkbox"/>
7	CP22	6/22/2022	9:51:17 AM	272930.31100	1825507.83300	954.37100	0.00000	0.00000	0.00000	<input type="checkbox"/>
8	CP22	6/22/2022	9:54:23 AM	272930.29300	1825507.83200	954.35800	0.00000	0.00000	0.00000	<input type="checkbox"/>
9	CP22	6/22/2022	9:57:18 AM	272930.32100	1825507.85900	954.33500	0.00000	0.00000	0.00000	<input type="checkbox"/>
10	CP22	6/22/2022	10:00:29 AM	272930.31600	1825507.84400	954.37700	0.00000	0.00000	0.00000	<input type="checkbox"/>
11	CP22	6/22/2022	10:04:36 AM	272930.30600	1825507.78700	954.34400	0.01463	0.01812	0.00850	<input checked="" type="checkbox"/>
12	CP22	6/22/2022	10:07:57 AM	272930.33400	1825507.79200	954.34000	-0.01337	0.01313	0.01250	<input checked="" type="checkbox"/>
13	CP22	6/22/2022	10:11:00 AM	272930.32500	1825507.81100	954.36500	-0.00438	-0.00588	-0.01250	<input checked="" type="checkbox"/>
14	CP22	6/22/2022	10:14:57 AM	272930.32800	1825507.80300	954.36400	-0.00737	0.00212	-0.01150	<input checked="" type="checkbox"/>
15	CP22	6/22/2022	10:20:24 AM	272930.32700	1825507.80800	954.31200	-0.00637	-0.00288	0.04050	<input checked="" type="checkbox"/>

AVERAGE	272930.32063	1825507.80513	954.35250	RMSE:	RMSE:	RMSE:
				0.01265	0.01063	0.02737
				Tolerance:	0.02900	0.03900
				PASS	PASS	PASS

AVERAGED GPS-DERIVED POSITION			
MONUMENT COORDINATES	NORTHING	EASTING	ORTHO HEIGHT
U.S. Survey FT (GRID)	272930.3206	1825507.8051	954.353

LEVELED ELEVATION		
U.S. Survey FT	N/A	(Fill out Level Run Sheet or N/A if no leveled elevation is available)
MONUMENT HELD		(Type the monument name from which leveling originated)
LEVELED ELEVATION - GPS DERIVED ELEVATION =	N/A	sft

FINAL MONUMENT COORDINATES				
MONUMENT COORDINATES	NORTHING	EASTING	ELEVATION	FEATURE CODE
U.S. Survey FT (GRID)	272930.3206	1825507.8051	954.353	CNPT
U.S. Survey FT (GROUND)	272940.8858	1825578.4705	954.353	CNPT

Notes:

Δ North, Δ East, and Δ Ht. are the difference between the average northing, easting, and height for each observation.

Mask Angle: 10°

FINAL GRID COORDINATES

Point ID	Northing	Easting	Elevation	Code
CP01	280061.0181	1808739.3616	945.37	CNPT
CP02	280085.2184	1809096.2041	946.44	CNPT
CP03	279997.7589	1809599.3144	950.38	CNPT
CP04	279990.1009	1810168.8468	944.75	CNPT
CP05	279953.5252	1810660.8943	937.67	CNPT
CP06	280289.4175	1812098.4445	934.28	CNPT
CP07	280362.0909	1812595.0877	934.24	CNPT
CP08	280429.1635	1813150.8574	937.86	CNPT
CP09	280453.8481	1813530.1098	944.25	CNPT
CP10	280350.3049	1815113.5198	937.51	CNPT
CP11	280209.7966	1815495.0113	934.96	CNPT
CP12	280039.0490	1815762.9226	934.25	CNPT
CP13	279702.1665	1816078.8660	932.76	CNPT
CP14	279184.2683	1816647.4537	941.42	CNPT
CP15	277376.8325	1818682.4836	948.35	CNPT
CP16	277185.3950	1818896.9513	949.74	CNPT
CP17	275049.6254	1821242.5498	957.10	CNPT
CP18	273762.3956	1822748.5283	945.87	CNPT
CP19	273431.0644	1823109.4016	935.44	CNPT
CP20	273356.0451	1823346.5495	932.80	CNPT
CP21	273052.4718	1824019.1071	934.32	CNPT
CP22	272930.3206	1825507.8051	954.35	CNPT

FINAL GROUND COORDINATES

Point ID	Northing	Easting	Elevation	Code
CP01	280071.8593	1808809.3779	945.37	CNPT
CP02	280096.0605	1809166.2342	946.44	CNPT
CP03	280008.5976	1809669.3640	950.38	CNPT
CP04	280000.9393	1810238.9184	944.75	CNPT
CP05	279964.3622	1810730.9849	937.67	CNPT
CP06	280300.2675	1812168.5908	934.28	CNPT
CP07	280372.9437	1812665.2533	934.24	CNPT
CP08	280440.0189	1813221.0445	937.86	CNPT
CP09	280464.7045	1813600.3116	944.25	CNPT
CP10	280361.1573	1815183.7828	937.51	CNPT
CP11	280220.6435	1815565.2891	934.96	CNPT
CP12	280039.0490	1815762.9226	934.25	CNPT
CP13	279712.9938	1816149.1664	932.76	CNPT
CP14	279195.0756	1816717.7761	941.42	CNPT
CP15	277387.5698	1818752.8848	948.35	CNPT
CP16	277196.1248	1818967.3608	949.74	CNPT
CP17	275060.2726	1821313.0501	957.10	CNPT
CP18	273772.9929	1822819.0869	945.87	CNPT
CP19	273441.6489	1823179.9742	935.44	CNPT
CP20	273366.6267	1823417.1312	932.80	CNPT
CP21	273063.0416	1824089.7149	934.32	CNPT
CP22	272940.8858	1825578.4705	954.35	CNPT