Central Region Survey Control Sheets – Standards, Characteristics, and Specifications

Function: The Survey Control Sheet (SCS) identifies all existing horizontal and vertical survey control in relationship to the current project centerline or baseline. This differs from a *Survey Control Diagram* (SCD) in that the SCD does NOT show the current project centerline/baseline. The principal users of the SCS will be other Land Surveyors who are performing boundary work in the vicinity of the project. The SCS has the potential to be used for many years. It's first user will typically be the surveyor staking out the current project. Other near-term users are Land Surveyors staking the project centerline after construction, replacing corners that were disturbed, DOT surveyors checking that work, and the Project Engineer to ensure that existing monumentation does not get disturbed.

Sealed, Signed, and Recorded: The SCS shall be sealed and signed by a Professional Land Surveyor licensed to practice in the State of Alaska. After construction SCSs will be modified to show set monumentation and filed independently as a Record of Survey (ROS). The PLS who generates the SCS and the PLS who ties newly set monumentation are required to seal and sign the ROS. (Notes explaining the limit of each PLSs involvement with the ROS will be included on the ROS)

Standards: In the preparation of a SCS, adherence to the State of Alaska DOT drafting manual will be **strictly** enforced. Read this document thoroughly since documents that do not substantially conform to these criteria will be rejected.

Scale: The sheets shall be drawn at a scale to clearly show the relationship between survey control and the project centerline. When selecting the scale, it must be remembered that all plan sets are published on 11”x17” sheets.

Content:

1. Horizontal and vertical control points and existing corners shall be identified with standard DOT symbols.

2. Each SCS shall show basic topographic background using a screened pen. The background will typically consist of the existing edge of pavement, buildings, significant land and water bodies. Label side street names. The goal here is to help orient the SCS user without cluttering the sheet.

3. The current project alignment/baseline(s) shall be shown. Tangents shall be labeled with bearings to the nearest second and distances to the hundredth of a foot. Curves shall have PC and PT's stations and coordinates labeled as well as Delta, Radius, Length, and Tangent values. On projects with multiple adjoining alignment/baseline(s) (such as ramp, side street, bike path, and frontage road alignment/baselines) the consultant shall meet with DOT Survey personnel to determine which alignment/baseline(s) shall be shown.

4. Cap marking details shall be drawn on the SCS as recovered or set. The cap drawings shall depict all markings on the cap including dings and scratches as well as showing their orientation relative to north.

5. Data Tables

A) Survey Control Table (SCT) - A table containing existing horizontal control points of sufficient quality to control the project. These points can be set or found points. The points shall be part of a closed traverse or redundantly tied points (as spelled out in the Statement of Services). The SCT shall show point number; Stations and offsets referenced from the current project alignment/baseline(s), Northings and Eastings (to five decimal places), and a description of the type of monument shall be shown. An example is shown below.

Survey Control Points					
Pt. #	Station	Offset	Northing	Easting	Description
2	54+24.62	17.98 Rt.	145382.2883	432702.2884	SET RBR/PC--PW-2
3	65+03.81	17.97 Lt.	146243.9907	433354.2957	SET RBR/PC--PW-3
4	85+89.35	18.10 Lt.	147112.8755	435252.7555	SET RBR/PC--PW-4
5	106+38.07	17.28 Rt.	147135.7433	437302.5763	SET RBR/PC--PW-5
18	237+55.29	25.37 Rt.	148503.7821	450037.0610	SET RBR/PC--HY-18

On projects with multiple sheets, the tables shall show only data applicable to the sheet on which the table is located.

B) Vertical Control Table (VCT) - A table containing existing vertical control points of sufficient quality to control the project. These points can be set or found points. All vertical control points shall be part of a closed level loop; side-shots are not acceptable. The VCT shall show point number, station and offset to the nearest foot referenced from the current project alignment/baseline(s), Northing and Easting to the nearest foot, elevations to the hundredth of a foot, and a description of Benchmarks and TBMs shall be shown. An example is shown below.

Vertical Control						
Pt. #	Station	Offset	Northing	Easting	Elevation	Description
99	61+71	69 Rt	145951	433192	324.91	TBM-2: RR spike in 10” birch
98	73+33	85 Lt	146525	434140	327.21	TBM-3[Old]: RR spike in 10” birch
97	87+57	82 Rt	147037	435433	348.15	BM PW-1: Copper coated rod
96	109+94	75 Rt	147077	437657	348.62	TBM-3: RR spike in 8” birch
95	128+97	33 Rt	147133	439560	373.91	BM PW-2: NE base bolt signal/lum. Pole
94	157+48	52 Lt	147106	442411	387.00	TBM-4: Copper coated rod
93	177+82	43 Rt	147136	444446	376.89	BM PW-3: Copper coated rod
92	201+87	108 Rt	147106	446860	370.61	TBM-5: RR spike in 10” birch
91	219+98	79 Lt	147375	448671	323.95	TBM-6: RR spike 6” cottonwood
89	236+25	78 Rt	148379	449977	346.56	BM PW-4: Copper coated rod
88	236+29	82 Rt	148373	449980	349.00	TBM Hyer-6: RR spike in 18” birch

On projects with multiple sheets, the tables shall show only data applicable to the sheet on which the table is located.

C) Additional Control - A table containing information about existing survey control that is not included in the other tables. The points shown here do not meet the standards for being shown in the above listed tables. Do NOT create this table or show these points if there is adequate control to stake the project shown in the Survey Control Table. This table is a "last resort" source of control. This table shall not have station and offset data for these points. Show coordinates to the precision commensurate with the points shown. A note explaining the limitations/potential errors of these points shall accompany the Additional Control Table.

6. Control Statements:

A) A horizontal control statement is required and will be provided by the Department of Transportation Survey Section. An example is shown.

Horizontal Control:

A local surface plane coordinate system based on a series of least squares adjusted traverses and GPS observations performed by AKDOT. NGS station O'Malley GPS 1986, a brass disk clamped to the top of a stainless steel rod, has coordinates of N 303,939.83891 E 353,363.25131. USC&GS station Loop 2 USE RM 3 1964,a brass disk on a concrete post, bears N 1 43'26" E 49,488.55 feet and has coordinates of N 353,405.98458 E 354,852.10794. Said line is the basis of bearings, NAD83(92) State Plane Grid.

Conversion from local feet to state plane, zone 4, NAD83(92) feet:

1. Translate local coordinates using +2296868.68775 N, +1312517.49044 E
2. Scale resulting coordinates using 0.9998910192 (base point 0,0)

B) A vertical control statement is required and will be provided by the Department of Transportation Survey Section. An example is shown.

Vertical Control:

MSL 1929 NGVD as determined by differential level loops performed by AKDOT between bench marks USC&GS BM V-102 1965, a brass disk clamped to a copper coated rod, with an elevation of 356.05 feet, USC&GS BM D-103 1965, a brass disk clamped to a copper coated rod, with an elevation of 301.58 feet, and USC&GS BM E-103 1965 a brass disk clamped to a copper coated rod, with an elevation of 285.89 feet.

7. SCS Notes:
The following note shall appear on all sheets:

Whether listed or not, all monuments or property markers corners, or accessories which will be disturbed or buried, shall be referenced and re-established in their original position (A.S. 19.10.260) and recorded (A.S. 34.65.040).

Additional notes shall be added as necessary to improve the function of the SCS.

8. Tied rectangular corners with connecting lines labeled with bearings to the nearest second and distances to the hundredth of a foot. Show Northings and Eastings to four decimal places at two existing corners on each sheet.

Additional Content -
ONLY when ROW plans or Airport Property Plan are NOT a part of the project:

1. A Monument Summary Table (MST) shall be included as a part of the SCS. If ROW plans are a part of the project, the MST will be a part of the ROW plan set. The MST shall show two types of corners: 1) all found corners, 2) monuments to be set as a part of the project. The found corners that have the potential to be disturbed by the project shall also be marked with the appropriate Section 642 work task(s) required to preserve their position. The MST shall include point number, station and offset from the current project alignment/baseline(s), Northing, Easting, Description, and the appropriate subsections of Section 642 of the Highways Construction manual as shown below.

Monument Summary Table

Pt #	Station	Offset	Northing	Easting	Description	642(8)	642(9)	642(10)	Record of Monument Form
603	81+15.15	0.12 Rt	146943.5926	434808.3546	Fd DOT BC/Bx: PC 186+10.50	X	X	X	X
614	89+52.32	0.15 Rt	147133.6145	435616.7452	Fd DOT BC/Bx: PT 213+54.59	X	X	X	X
615	121+95.44	0.03 Lt	147170.8447	438859.6427	Fd DOT BC/Bx: PC 319+94.26	X	X	X	X
627	129+39.30	0.18 Rt	147167.1395	439603.4657	Fd DOT BC/Bx: PT 344+35.10	X	X	X	X
636	129+49.27	17.77 Rt	147149.3468	439613.0643	Fd DOT BC/Bx: SEC 1|6\12|7 *T17N R1W|1E				
652	13687.87	0.18 Rt	147151.5511	440351.8764	Fd DOT BC/Bx: PC 368+90.49	X	X	X	X
654	143+90.67	0.19 Rt	147147.6113	441054.6332	Fd DOT BC/Bx: PT 391+95.87	X	X	X	X
655	155+45.60	5.10 Lt	147164.0456	442209.4638	Fd Rebar A/C				
662	181+85.10	0.20 Rt	147184.2140	444848.8881	Fd DOT BC/Bx: SEC 6|5\7|8 *T17N R1E	X	X	X	X
663	198+20.52	0.19 Rt	147202.8089	446484.2086	Fd DOT BC/Bx: PC 570+08.86	X	X	X	X
667	205+23.89	0.17 Rt	147246.6726	447185.9247	Fd DOT BC/Bx: PT 593+17.42	X	X	X	X
669	216+65.86	0.16 Rt	147375.9332	448320.5483	Fd DOT BC/Bx: PC 630+63.58	X	X	X	X
670	226+04.65	0.09 Rt	147754.4878	449163.4640	Fd DOT BC/Bx: PT 661+43.86	X	X	X	X
671	246+12.73	0.08 Lt	149095.0208	450658.5692	Fd DOT BC/Bx: PI 727+31.99	X	X	X	X
682	278+63.57	0.01 Lt	151248.3772	453093.9458	Fd DOT BC/Bx: PC 833+95.08	X	X	X	X

2. Monuments to be set as a part of the project shall also be shown graphically when ROW plans or Airport Property Plan are NOT a part of the project.

3. Sufficient right-of-way boundary information to ensure that the project is being constructed within lands that the project sponsor (typically DOT/PF) controls.