PREAMBLE: This "As-Built" or Post Construction survey specification is a flexible, guide document that may be modified with professional discretion as particular occasion may require. The American Congress on Surveying and Mapping and its member organization, the National Society of Professional Surveyors, recommend that when an "As-Built" survey is required, the survey should be performed substantially in conformity with this specification and that the client and surveyor should make every effort to place a copy of the survey in an appropriate public record.

SECTION 1. AUTHORITY: This specification is recommended by the National Society of Professional Surveyors, a member organization of the American Congress on Surveying and Mapping.

SECTION 2. PURPOSE OF THIS SPECIFICATION: This specification will identify tasks to be accomplished while performing an "as-built" survey. The specification will describe what should be done, but not how to do it.

2.1 An as-built survey should be performed for computing pay quantities, recovering control monuments, locating easements, facilities and structures, and for creating a permanent record of such facilities.

SECTION 3. DEFINITION: A post construction or as-built survey is made after a facility has been constructed to obtain the necessary dimensions for establishing a permanent record of the location of all facilities. Construction and post construction surveying should be performed under the direction of a person licensed to practice surveying who is well versed in maintaining accuracy, precision, efficiency, measuring, and computing values pertaining to such surveys. An as-built survey may follow completion of construction or be made incrementally as phases of construction are completed.

SECTION 4. SERVICES AND FINAL REPORTS: An as-built survey will document, but will not be limited to the following:

4.1 Recovery of points that control the construction.

4.2 Horizontal Control: Established and referenced primary control monuments.

4.3 Vertical Control: Established permanent control elevations (bench marks) sufficiently described as to datum and location, and placed in secure areas so they can be used in the future.

4.4 The location of constructed facilities, improvements and easements.

4.5 The placement of electronically detectable markers for future recovery and identification of important underground facilities such as fuel, communications and electric lines (with client approval).

4.6 A final drawing, indicating the horizontal and vertical location of facilities, control monuments, improvements and easements as determined by a post construction survey.

SECTION 5. INFORMATION REQUIRED: Sufficient information concerning the construction site should be furnished to the surveyor by the client, the architect, the general contractor or other designated agent and should include, but not be limited to:

5.1 A certified boundary or right-of-way plat and a topographic map of the site together with pertinent maps. Such boundary survey is a prerequisite of the as-built survey.

© Copyright 1985 American Congress on Surveying and Mapping
Reproduction prohibited in whole or in part without approval of ACSM.
SECTION 5.2. Detailed construction plans for the project, including the proposed location of all facilities, improvements and easements.

SECTION 5.3. Elevations, datum and descriptions of vertical control points used for the topographic survey and for construction.

SECTION 5.4. The plans of existing facilities that were or are to be joined or modified.

SECTION 5.5. The name or names, addresses and telephone number(s) of the person(s) in charge of the project.

SECTION 5.6. Schedules for excavating and backfilling in respect to underground facilities.

SECTION 6. MONUMENTS: Monuments in this specification are defined as primary and secondary monuments.

SECTION 6.1. Primary Monuments: Primary monuments should be established beyond the construction activity and should be of sufficient size, depth and composition to endure beyond completion of the project. Wooden stakes for primary monuments should not be used.

SECTION 6.2. Secondary Monuments: Secondary monuments are to be used on a temporary basis and should be established close enough to the perimeter of a structure or facility to be convenient for use, but far enough from the structure to be protected from construction activities.

SECTION 6.3. All monuments shall be marked and flagged, and witnessed in a manner that will provide for ease of recovery.

SECTION 7. SITE CONDITIONS: Certain conditions with respect to locale, such as rural, suburban, urban and urban business districts, including offshore facilities, often affect the precision of surveys. The procedures used should support the tolerances shown in Table 1.

SECTION 8. TOLERANCES: A post construction survey for as-built purposes must locate all facilities within the minimum tolerances shown on Table 1. Exceptions, if any, shall be explained by technical notes on the final plat.

SECTION 9. FIELD TOLERANCES: All field work shall be performed in accordance with accepted technical methods as expressed in standard textbooks on surveying theory, practice and procedures. Textbooks used for the purpose of surveying instruction by any accredited university or college in the appropriate state will be considered a satisfactory text for this purpose. Any person in charge of a survey field party shall be well trained in the technical aspects of surveying.

SECTION 9.1. All survey field work should be scheduled to permit location of all facilities at the earliest opportunity, before the facilities are obscured by back filling, paving or other installations.

SECTION 9.2. The surveyor should have a pre-arrangement with the client to place all necessary electronically detectable markers on the facilities before they are covered.

SECTION 9.3. All as-built locations should be made from the primary monument control and closed back into a different point within the primary monument control net. The state plane coordinate system should be used when practical.

SECTION 9.4. All vertical locations should be established from pre-established bench marks and checked by closing to a different bench mark on the project datum.

SECTION 9.5. Where special surveys for vertical or horizontal control are required as a base for a construction survey, relevant special publications from the U.S. Department of Commerce, the Department of the Interior, or the Department of the Army will be considered as satisfactory texts to define acceptable field methods.

SECTION 10. MAPS, PLATS AND DRAWINGS: The final plat should be prepared on a reproducible plan, map or drawing at a suitable scale in accordance with Table 1. and should fully depict the improvements as-built.

SECTION 10.1. Any stable base standard drawing paper, linen or film of reproducible quality will be considered as suitable material for such final plat.
10.2 No plat, map or drawing shall be made on a sheet size smaller than 8 1/2 by 11".

10.3 Dimensions necessary to reference structures, improvements and easements to property lines or permanent base lines shall be neatly and legibly shown on the final plat.

10.4 Each property line monument found shall be labeled as "Pound" with a brief definition or description of the monuments as to size, type of material and what it represents.

10.5 Each property line monument set for the development of the final plat shall be labeled as "Set" with a brief definition thereof as to size, type of material, and description. These monuments shall be set in accordance with specifications for a Land Title Survey.

10.6 All map symbols should be referred to a legend or appropriately identified on the map with sufficient labeling.

10.7 Facilities, improvements and easements, and other similar data (including electronically detectable markers) shall be represented by symbol or labeled and dimensioned, and referenced to the primary monument control, coordinate system or the nearest property line.

10.8 All maps, plats or drawings must show a North arrow, and the drawing should be oriented as nearly as possible so that North is toward the top of the sheets.

10.9 The basis of bearing whether Geodetic North, State Plane Coordinate System or other permanent reproducible source, independent of project base lines, shall be clearly stated and shown.

10.10 An orderly compilation of relevant facts and sources, such as a list of coordinates, elevations, monument descriptions (including electronically detectable markers) and a statement of datum shall be included especially where the plat is to be made for a large or complicated project.

10.11 When a flood plain is involved, the finished floor elevations, the flood plain limit, and a bench mark referring to the project datum shall be shown on the plat.

10.12 Any suitable title block is acceptable so long as the caption "Post Construction Survey" is used and the location, date and scale is included.

10.13 The surveyor should develop procedures that will protect against the unauthorized alteration of his final plat.

10.14 The client should be advised if the map will be filed for record in accordance with local or state law.

SECTION 11. DESCRIPTIONS: Description procedure in this specification may differ from regular boundary surveys. The property description shown on the final plat shall be the description furnished in accordance with SECTION 5.1.

11.1 When the property description furnished the surveyor is used as part of the plat, a note on the map, plat or drawing will include a complete reference to the source document.

11.2 When the furnished description cannot be used and a new description is necessary, the client will be advised that a separate boundary survey should be performed and the surveyor will follow the land title survey specifications for proper procedures.

SECTION 12. CERTIFICATIONS: The certification statement for each final plat, map or drawing must be signed and sealed by a person licensed or registered to practice land surveying who is responsible for the as-built survey and the platted data. Rubber stamps of signatures are not to be used. The seal is to be affixed in accordance with local or state law.

12.1 A certification statement which incorporates by reference the requirements of these specifications shall be written in a form similar to the following:

12.1.1 I hereby certify that this survey was performed in accordance with post construction survey specifications of ACSM/NSPS.

Adopted by the Board of Direction,
American Congress on Surveying and Mapping,
March 15, 1985
### Table 1

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>REMARKS***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted Closure (Minimum)</td>
<td>1:4,000</td>
<td>1:5,000</td>
<td>1:7,500</td>
<td>1:10,000</td>
<td>Locative Loop for Multiple Structures</td>
</tr>
<tr>
<td>Angular Closure (Minimum)</td>
<td>40° √N</td>
<td>30° √N</td>
<td>25° √N</td>
<td>15° √N</td>
<td>N-Number of Angles in Locative Loop</td>
</tr>
<tr>
<td>Accuracy of Bearing in Relation to Source</td>
<td>± 1 Min.</td>
<td>± 40 Sec.</td>
<td>± 30 Sec.</td>
<td>± 20 Sec.</td>
<td>Sin Q = Denominator in Error of Closures Divided into 1 (Approx)</td>
</tr>
<tr>
<td>Linear Distances Accurate to:</td>
<td>± 0.25 per 1000</td>
<td>± 0.2 per 1000</td>
<td>± 0.15 per 1000</td>
<td>± 0.1 per 1000</td>
<td>For Locative Loop Regarding Multiple Structures (in feet or meters)</td>
</tr>
<tr>
<td>Positional Tolerance of Any Monument Relative to Project Baseline Origin</td>
<td>1:12,000</td>
<td>1:15,000</td>
<td>1:20,000</td>
<td>1:30,000</td>
<td>For Base Lines in Multiple or Major Construction Sites</td>
</tr>
<tr>
<td>Calculation of Area</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>Not Applicable unless Required by Client</td>
</tr>
<tr>
<td>Elevations for Bench Marks (Loop Closures into Site)</td>
<td>0.1 √N or 0.024 √N</td>
<td>0.08 √N or 0.019 √N</td>
<td>0.05 √N or 0.012 √N</td>
<td>0.02 √N or 0.005 √N</td>
<td>M-Number of Miles and KM-Number of kilometers in loop. (Results are +)</td>
</tr>
<tr>
<td>*Location of Improvements, Structures, etc.</td>
<td>± 0.25 per 1000</td>
<td>± 0.2 per 1000</td>
<td>± 0.15 per 1000</td>
<td>± 0.1 per 1000</td>
<td>In relation to Property or site Boundaries</td>
</tr>
<tr>
<td>Scale of Maps Sufficient to Show Detail, but No Less Than:</td>
<td>1&quot;=200' or 1:25,000</td>
<td>1&quot;=1000' or 1:10,000</td>
<td>1&quot;=400' or 1:5000</td>
<td>1&quot;=200' or 1:2000</td>
<td>Plan Drawings to Show* Location of Base Lines, Bench Marks, Refer. etc.</td>
</tr>
<tr>
<td>Elevation Check Between Bench Marks on Site</td>
<td>± 0.05 ft. or ± .015m</td>
<td>± 0.03 ft. or ± .01m</td>
<td>± 0.02 ft. or ± .006m</td>
<td>± 0.02 ft. or ± .006m</td>
<td></td>
</tr>
</tbody>
</table>

* Business District Improvement locations within 10 (3m) feet shall not have an error of more than one percent over the platted distance.
** For city work (utilities) use 1" = 50' or 1:500, minimum.
*** Minimum tolerances for offshore surveys are not included.

---

**"AS-BUILT" SURVEY SPECIFICATIONS**

(A Post Construction Survey)

---

American Congress on Surveying and Mapping

210 Little Falls Street, Falls Church, Virginia 22046
(703) 241-2446