What is the preferred orientation for a North arrow on a plan sheet?

By John Houle and the East Willamette Design Section

Staff frequently ask this question: “Should the north arrow point up, or to the right side, or to the left side on a plan sheet; or does it really matter which direction it points?”

The answer is “Yes, it does matter.” It matters because where the North arrow points directly determines the orientation of the sheet to effectively present information.

Plans are one of the primary BES work products that become part of contract documents. Considerable time and effort go into developing plans that are informative, clear and understandable. Designers establish specific performance criteria, including technical specification information, and CADD technicians use their experience to present data in ways that others can successfully use.

In the past, the quandary of North and other such questions sometimes led to heated discussions, at times so vehement as to require refereeing. There is a better way. It begins with understanding the need for communication – for discourse and open discussion between staff who design and staff who translate design ideas into graphic information.

Early and frequent communication among staff allows for more technical and creative solutions, smoother relations between groups, and, finally, a better end-product all around. The following paragraphs provide guidelines to assist staff working on planning single or multi-sheet projects. It is hoped that these procedures will aide in promoting positive, professional working conditions and relationships, central to the success of BES projects.

1. **BES Accepts Three Directions For A North Arrow To Point**

   When orienting the North arrow on a plan sheet, BES prefers three directions. In order of preference, they are: 1) pointing toward to the top, 2) pointing toward the left side, or 3) pointing to the right side. The only direction that is NEVER accepted is directing the north arrow toward the bottom of a sheet.

2. **Plan Sheet Orientation Will Affect The Direction Of The North Arrow And, Ultimately, User Understanding**

   This generalization is true for any project, no matter how simple or complex. For this reason, project team members need to meet at the outset of a project to plan and establish how to orient the plans for the greatest clarity.

3. **Selection Of Optimal Orientation For A Plan Set Requires The Preparation Of A Scale Map Of The Project Area, Including All Sewers.**

   A scale map can help establish graphic representation and determine the index of necessary plan sheets. When deliberating project graphics, consider the following items:

   - Plan and Profile sheet C-1 must include the lowest point on the system.
   - In general, recipients of BES plans read from left to right.
   - Whenever possible, avoid representing pipe slopes that increase from left to right on one sheet, and increase from right to left on the following sheet, and so on throughout the plan set. Otherwise, confusion and disorientation can result among users of the plans.
   - It is more desirable to let the north arrow direction vary from sheet to sheet in a plan set in order to maintain pipe slope consistency throughout.

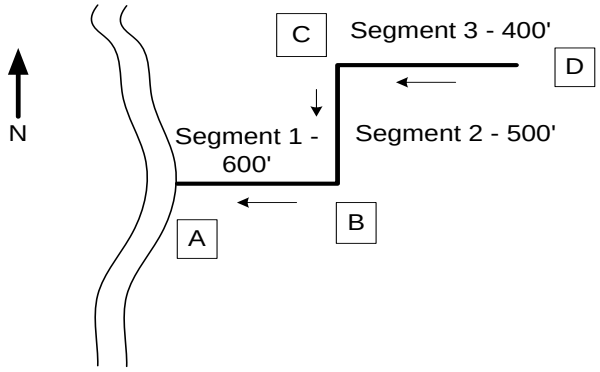
     Otherwise, if the North arrow remains fixed, the user may have problems with seemingly inconsistent slope information or difficulty easily orienting the plans.
   - Always remember to consult with team members and ask others' opinions, especially if there are several seemingly acceptable ways to orient a plan set.
   - If possible, always try to meet the greatest number of these guidelines on every project.

The following examples demonstrate the breadth and variability of issues facing BES staff when planning and preparing project plans. Reference the discussions that follow each example when executing a project. The most important premise to remember is the need for staff to communicate their thoughts among each other as changes are deliberated and a final design complete.

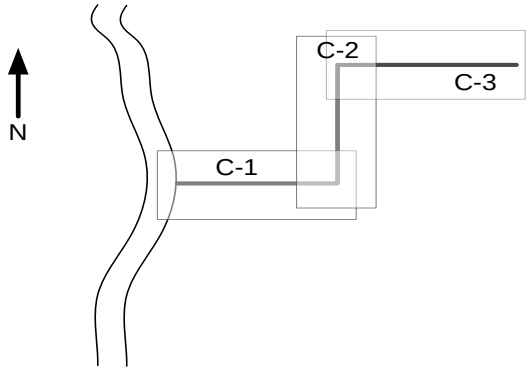
Example 1

Project Information

Point A has the lowest elevation. The entire system drains toward point A. The system is comprised of three segments totaling 1500 feet. Spot elevations are as follows: A=100 feet, B=106 feet, C=115 feet, D = 122 feet. North is oriented as shown.



Possible Sheet Layout and Presentation Solution



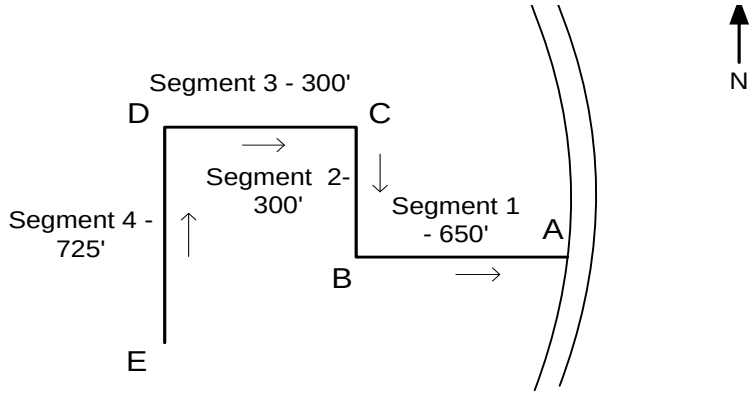
Use a standard 22x34 inch format sheet for plan and profile. The dimensions of the area available for the plan and profile are approximately 6x 27 inches. Select standard horizontal and vertical scales to most clearly present information.

The figure above depicts a possible plan for preparing plan and profile sheets. This organization achieves the following objectives: The lowest elevation in the system is shown on sheet C-1, distances from point A increase from left to right, the slope of each successive segment increases from left to right, the direction of the North arrow varies from sheet to sheet but it points in one of three accepted directions.

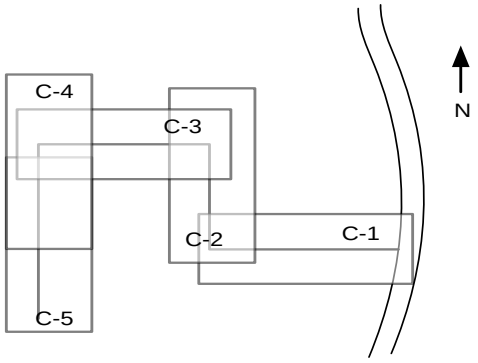
Example 2

Project Information

Point A has the lowest elevation. The entire system drains toward point A. The system is comprised of four pipe segments totaling 1975 feet. System elevations are as follows: A=100 feet, B=120 feet, C=125 feet, D = 150 feet and E=175 feet. North is oriented as shown.



Possible Sheet Layout and Presentation Solution



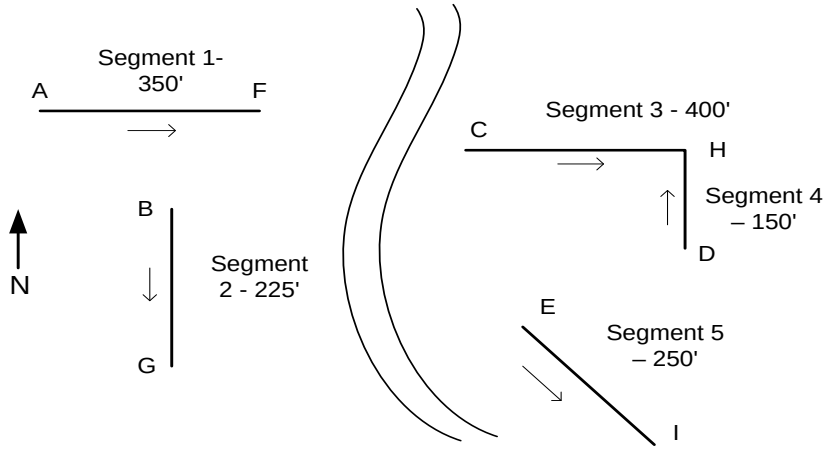
Use a standard 22x34 inch format sheet for plan and profile. Select standard horizontal and vertical scales to most clearly present information.

The figure above depicts a strategy for preparing plan and profile sheets. This organization achieves the following objectives: The lowest elevation in the system occurs on sheet C-1. Beginning at point A segment distances increase from right to left. The slope of each successive segment increases from right to left. Note that to realize a continuous positive slope increase in a right-to-left direction the user's viewing position changes for each sheet (e.g. C-1 face north, C-2 face toward the river, C-3 face north and sheets C-4 & 5 face away from the river). This causes the North arrow direction to vary, but it always points in one of three accepted directions.

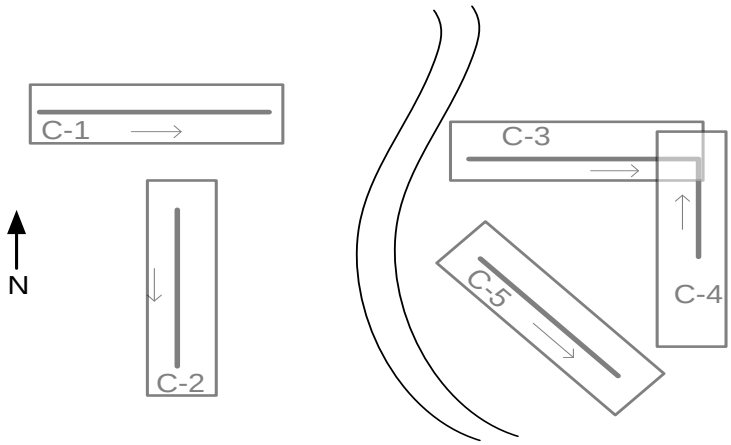
Example 3

Project Information

Points A, B, C, D and E are the highest points in each pipe segment. Points F, G, H and I correspond to low points. Each segment drains, as shown. Each segment length is as follows: A-F=350 feet, B-G=225 feet, C-H=400 feet, D-H=150 feet and E-I=250'. None of these segments is continuous to each. Except for segments C-H and D-H none drain to a common low point. North is oriented as shown.



Possible Sheet Layout and Presentation Solution



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The figure above depicts one strategy for preparing plan and profile sheets for these isolated segments. Before selecting a layout, decide whether to orient all profiles with an increasing slope from L to R or R to L. Because each segment has a different orientation, holding a fixed North direction is not practical. Only an increasing R to L slope works consistently to organize these sheets and produces the following North arrow orientation: up on C-1, C-3 and C-5, left on C-2 and right on C-4. Choosing a slope L to R creates the North arrow on C-1 pointing toward the bottom.