

AirValve 10.0 Tutorial

INTRODUCTION:

To illustrate the use of the web-based AirValve 10.0 program, a sample pipeline profile is included with the program. The sample is based on the pipeline profile drawing attached to this document and can be used as an interactive training tool for learning about air valves and the AirValve computer program. The program will locate and size air valves along a pipeline and print a valve schedule and pipeline profile. The methodology is consistent with AWWA Manual M51, "Air-Release, Air/Vacuum, and Combination Air Valves." Note: the program does not conduct a surge or transient analysis.

PROGRAM OVERVIEW:

1. Start the program from the Val-Matic Web Site. Registration is required to run and save projects in the program. Click on "Our Privacy Policy" to see the terms of use.



The screenshot shows the Val-Matic logo in the top left corner. The main header is "AirValve Sizing Program" in a green bar. On the left is a blue navigation menu with links for Home, Login, and Tutorial. The main content area is titled "Register New User" and contains a registration form with the following fields: Email, Password, Confirm password, Name, Company, City, State, and Country. Each field has a red asterisk to its left. Below the form is a link for "Our Privacy Policy". At the bottom of the form are "Cancel" and "Register" buttons.

The program has several sections or tabs as shown in the menu below.

2. Click on **Introduction** to learn about the program.
3. Click on **Tutorial** to learn and perform a practice analysis.
4. Click on **Pipeline Air Valve Sizing** to perform a pipeline analysis. Sample project data will be shown.
5. Click on **Well Service Air Valve Sizing** to size a valve for pump discharge service. Sample project data will be shown.
6. Click on **My Saved Projects** to maintain or load your saved projects.
7. Click of **Logout** to end your session.



AirValve Sizing Program

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AirValve

AIR VALVE SIZING PROGRAM
(Version 10.0.2011)

Val-Matic

[Disclaimer Notice](#)

The Air Valve Sizing Software Program was developed by Val-Matic Valve and Manufacturing Corporation as a convenience to its customers and should be utilized only as a guide for the selection of Air Valves along a pipeline.

This software program is not presented as, nor is it intended to be used as, a complete hydraulic transient study.

This software program is offered on an as is basis. All risk regarding the appropriateness of the application are assumed by the user.

Val-Matic makes no warranty or representation as to the accuracy or completeness of this software program or its output. Use of this software program or its output should be made under the direction of trained engineers or design professionals exercising their independent judgment regarding the suggested use of the valve types and sizes.

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DESCRIPTION OF PIPELINE:

This tutorial is based on the attached drawings and a 48" buried water pipeline to be constructed in Florida over a generally level terrain. The Stations and corresponding Elevations are given on the attached pipeline profile sheets. The water will be pumped by a battery of (5) 24" pumps with a rated capacity of 12,000 GPM each at 310 feet of head. The design capacity of the pipeline is 30,000 gpm with 3 pumps running. The pipeline will be filled with one pump at 12,000 gpm.



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Pipeline Air Valve Sizing

Name:

Owner:

Engineer:

Max Flow Rate:

Fill Rate:

Valve Selection Criteria:

Type of Media:

Pipe Material:

Plastic Pipe Collapse Pressure:

Pipe Inner Diameter:

Steel Thickness:

Safety Factor:

Valve Rating:

Flow Direction:

Pipeline Profiles

Station	Elevation	Del
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="X"/>
<input type="text" value="3200"/>	<input type="text" value="10"/>	<input type="text" value="X"/>
<input type="text" value="8400"/>	<input type="text" value="10"/>	<input type="text" value="X"/>
<input type="text" value="9200"/>	<input type="text" value="20"/>	<input type="text" value="X"/>
<input type="text" value="11200"/>	<input type="text" value="16"/>	<input type="text" value="X"/>
<input type="text" value="12000"/>	<input type="text" value="2"/>	<input type="text" value="X"/>
<input type="text" value="12800"/>	<input type="text" value="16"/>	<input type="text" value="X"/>
<input type="text" value="13600"/>	<input type="text" value="20"/>	<input type="text" value="X"/>
<input type="text" value="14400"/>	<input type="text" value="20"/>	<input type="text" value="X"/>
<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value="X"/>

Two materials are being considered for the pipe. The first material is 48" OD steel pipe with a wall thickness of 1/4". Alternatively, ductile iron is being considered and the effect on valve sizing will be analyzed. A Safety Factor of 4:1 should be used for computing the collapse pressure of the pipe. Click on the **New** Button and enter this data into the **Pipeline Air Valve Sizing Window** as shown above. Use the Help ? buttons when necessary.

Based on the profile provided, the station points with significant changes in grade are shown in the input table. Other station points with additional valve locations may then be recommended by the program. The flow direction is from Station 0+00 to Station 144+00, which is entered as "With Increasing Stations". Stations can be entered as 144+00 or 14400 ft.

SAMPLE PROBLEM

The following example called SAMPLE10 is included with the program to act as a tutorial and illustrate a typical application. To run this application, simply select **SAMPLE10** from **My Saved Projects**. Click on the **Analyze** button to view the Analysis.

ANALYSIS:

After all of the data is entered, the profile graph and valve schedule will appear as shown below. Look at the screen below and answer the following questions.

VAL-MATIC® AirValve Sizing Program

Analysis Results

Vacuum sizing pressure: 2.446 PSI

Station (ft)	Elevation (ft)	Description	Recommended Valve Size/Model	Flow Rate CFS	Slope
0	0.00	Beginning of Pipeline	No valve necessary	0.000	0.000
1600	5.00	* Long Ascent	8 IN #108SS Air/Vac Reg-Ex	77.360	0.003
3200	10.00	High Point	8 IN #108SS/38 Surge-Suppression	77.360	0.003
4933	10.00	* Horizontal Run	2 IN #38.2 Air Release	0.000	0.000
6667	10.00	* Horizontal Run	4 IN #104SS/22.9 Surge-Suppression	0.000	0.000
8400	10.00	Low Point	No valve necessary	0.000	0.000
9200	20.00	High Point	10 IN #110FSS/45 Surge-Suppression	134.662	0.013
11200	16.00	Increase in Down Slope	8 IN #108SS/38 Surge-Suppression	95.365	-0.002
12000	2.00	Low Point	No valve necessary	159.334	-0.018
12800	16.00	Decrease in Up Slope	8 IN #108SS Air/Vac Reg-Ex	74.166	0.018
13600	20.00	High Point	8 IN #108SS/38 Surge-Suppression	85.168	0.005
14400	20.00	End	No valve necessary	0.000	0.000

(*) These Stations were added because the segment length exceeded 2500 ft. (762 M)

PDF Graph PDF Report Add Notes Close

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1. Does the Graph resemble the profile used for data entry?

2. Is the flow direction correct? *[the flow direction should be left to right]*
3. Do the valve types appear logical for high points and other changes in grade?
4. Valves are usually located at 1500-2500 ft. intervals. Is that the case here?
5. Did the computer add any additional stations? Why? *[The program will add points in long horizontal or sloping runs if the pipe length between stations exceeds 2500 ft.].*
6. For the steel pipe, what is the Vacuum Sizing Pressure shown at the bottom of the screen. Why not the standard sizing differential of 5 psi? *[The pressure should be 2.45 psi which is that collapse pressure of the 48" pipe with a 4:1 safety factor.]*
7. Close the Analysis Window and revise the pipe material to ductile iron and click the **Analyze** button again. Does the Vacuum Sizing Pressure change? Why? *[Ductile iron is not subject to collapse and 5 psi is used for sizing valves.]*
8. Read the descriptions of the Station Points in the table. Do you agree with the descriptions?
9. Click on the **Add Notes** Button to open the **Notes Window** and enter some notes about your analysis. Hit the **Close** button and your notes will be saved.
11. If you are connected to a printer, click on the **PDF Graph and PDF Report** buttons to get hard copies of the graph and a report of your analysis.

NOTE: If there are too many valves in an analysis, enter only major high points and low points (i.e. greater than at least one diameter). To delete points, click on the **X** to the left of the Station Point in the Pipeline Profile input table. Stations can also be added at any time by adding them to the bottom of the table.

WELL SERVICE AIR VALVE SIZING

1. Go to the **Well Service Air Valve Sizing Tab**. Enter a No-Load flow rate of 12,000 GPM.
2. Select a valve pressure class and click on the **Analyze** button.
3. The valve model should appear in the window to the right.

The screenshot shows the Val-Matic AirValve Sizing Program interface. The header features the Val-Matic logo and the title "AirValve Sizing Program". A left sidebar contains navigation links: Home, Introduction, Tutorial, Pipeline Air Valve Sizing, Well Service Air Valve Sizing (highlighted), My Saved Projects, Users, and Logout. The main content area is titled "Well Service Air Valve Sizing" and contains the following form fields and buttons:

Name:	<input type="text" value="Sample"/>
Owner:	<input type="text" value="Valmatic"/>
Engineer:	<input type="text" value="Valmatic"/>
Pump No-Load Flow Rate:	<input type="text" value="1201"/> <input type="button" value="GPM"/>
Valve Rating:	<input type="text" value="150 Psig (Class 125 Iron)"/>
Recommended Valve:	6 IN #106SS Well Service Air Valve

At the bottom of the form are four buttons: **Analyze**, **Save**, **Add Notes**, and **PDF Report**.

FOR FURTHER INFORMATION:

This program is for exclusive use of Val-Matic agents and customers. For additional copies of this program or additional information, please contact:

Val-Matic Valve & Mfg. Corp

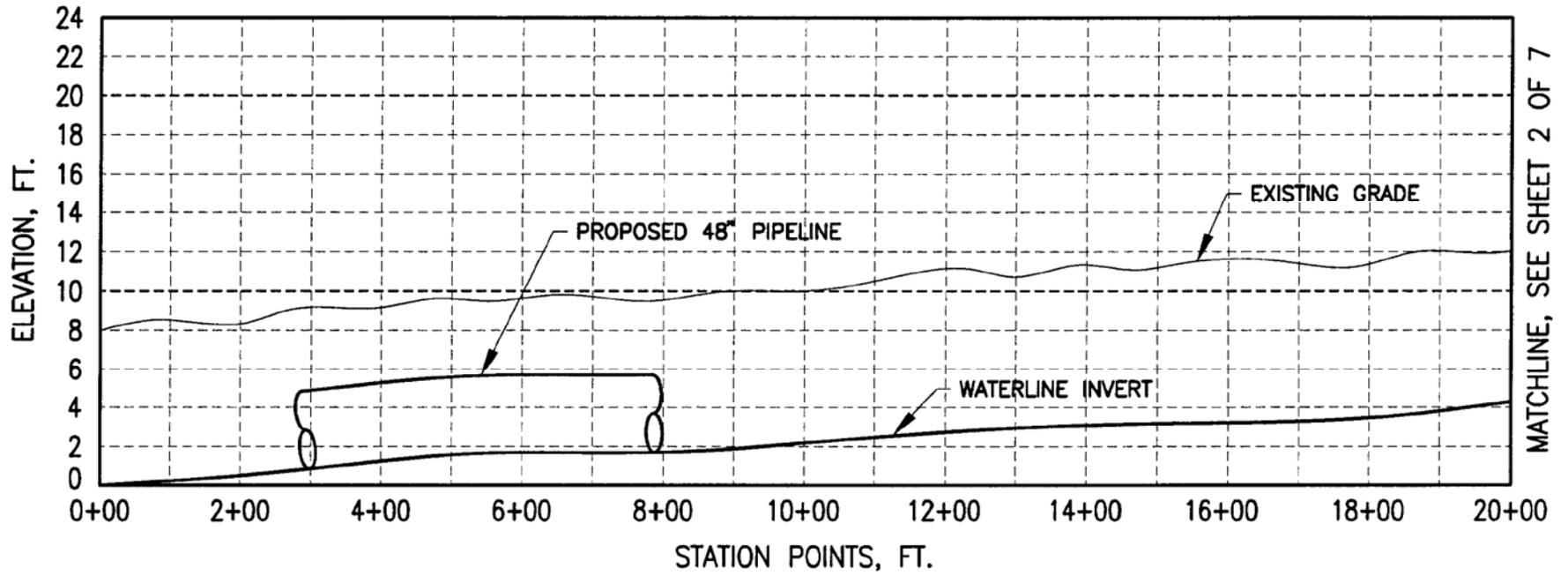
905 Riverside Drive

Elmhurst, IL USA

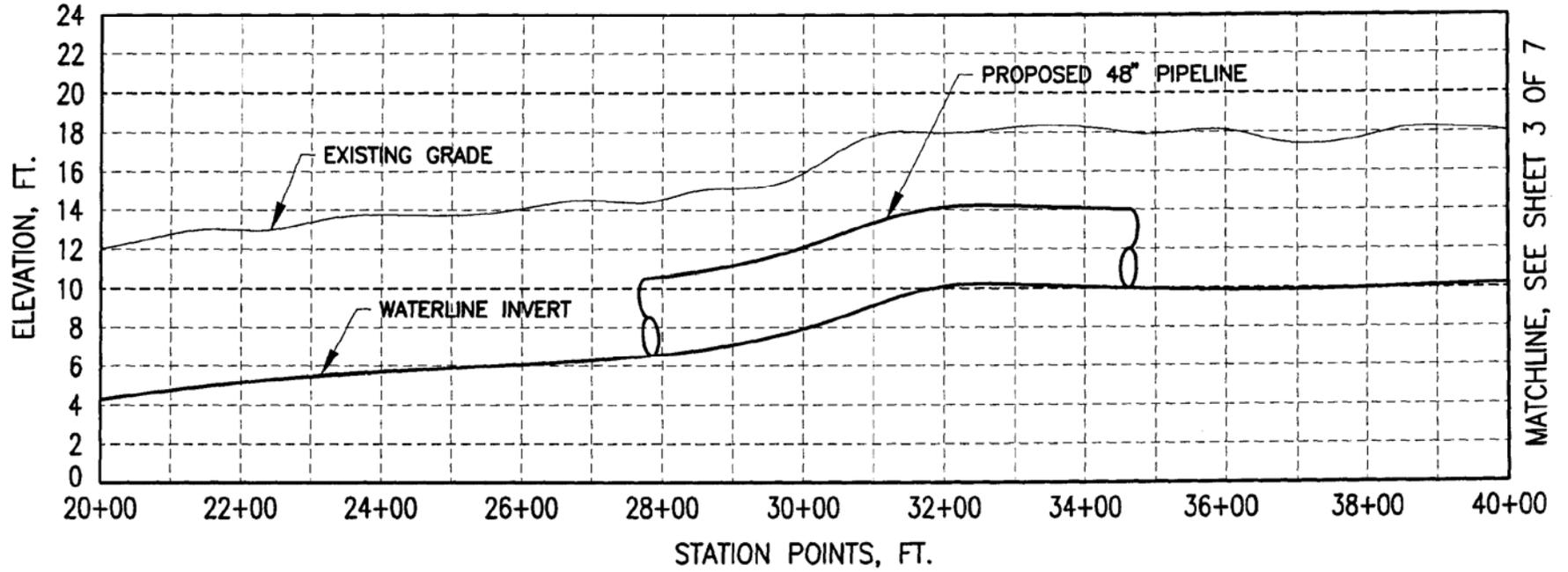
Phone: (630) 941-7600

[Business hours 8:00 AM to 5:00 PM Mon-Fri Central Std. Time]

PIPELINE PROFILE

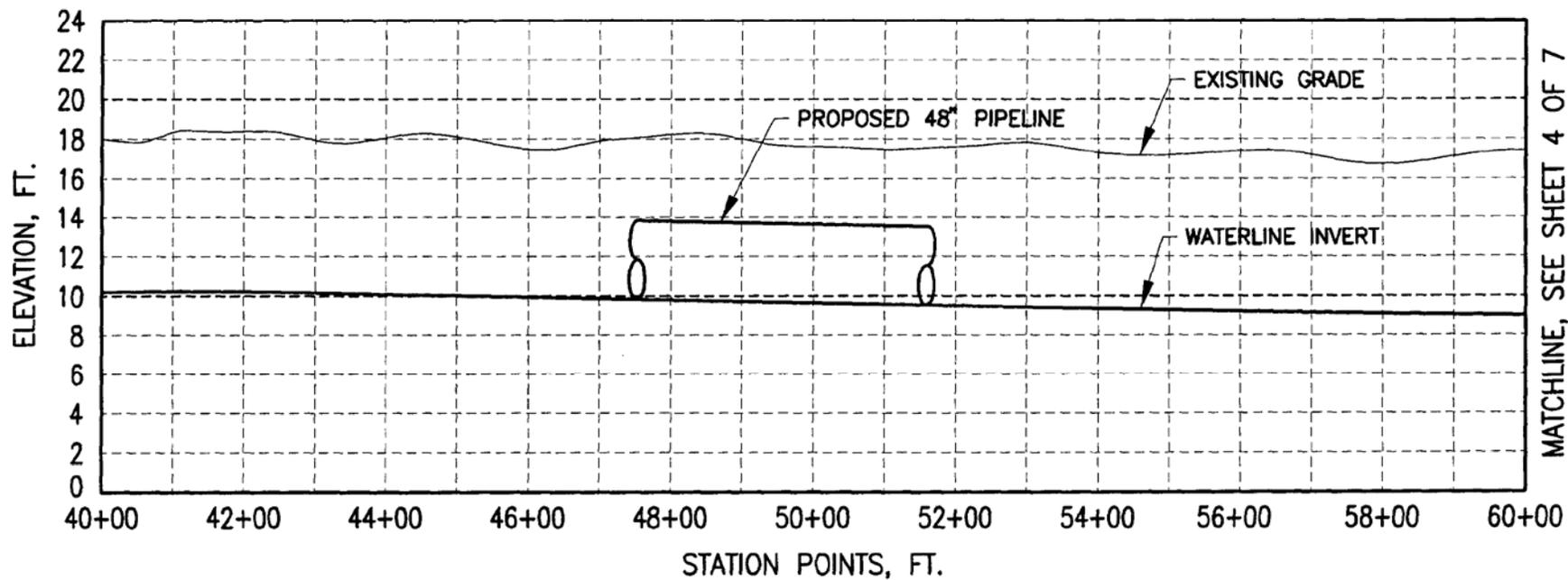


PIPELINE PROFILE



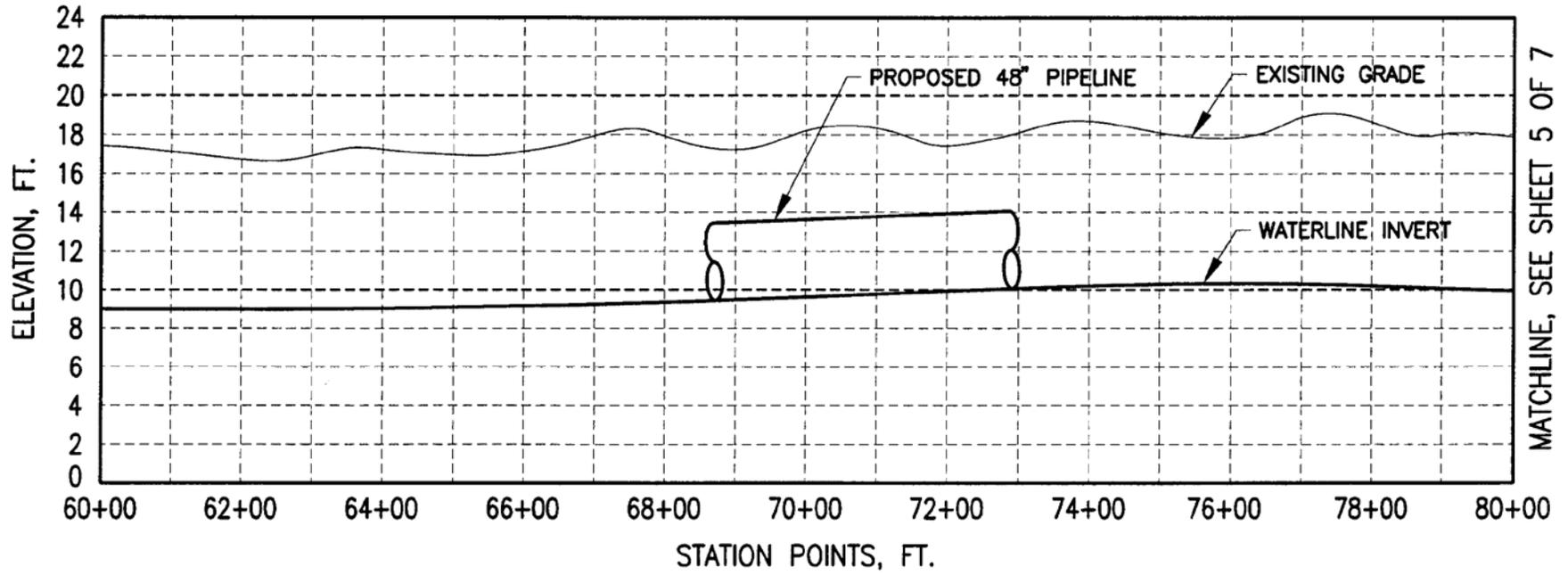
MATCHLINE, SEE SHEET 3 OF 7

PIPELINE PROFILE



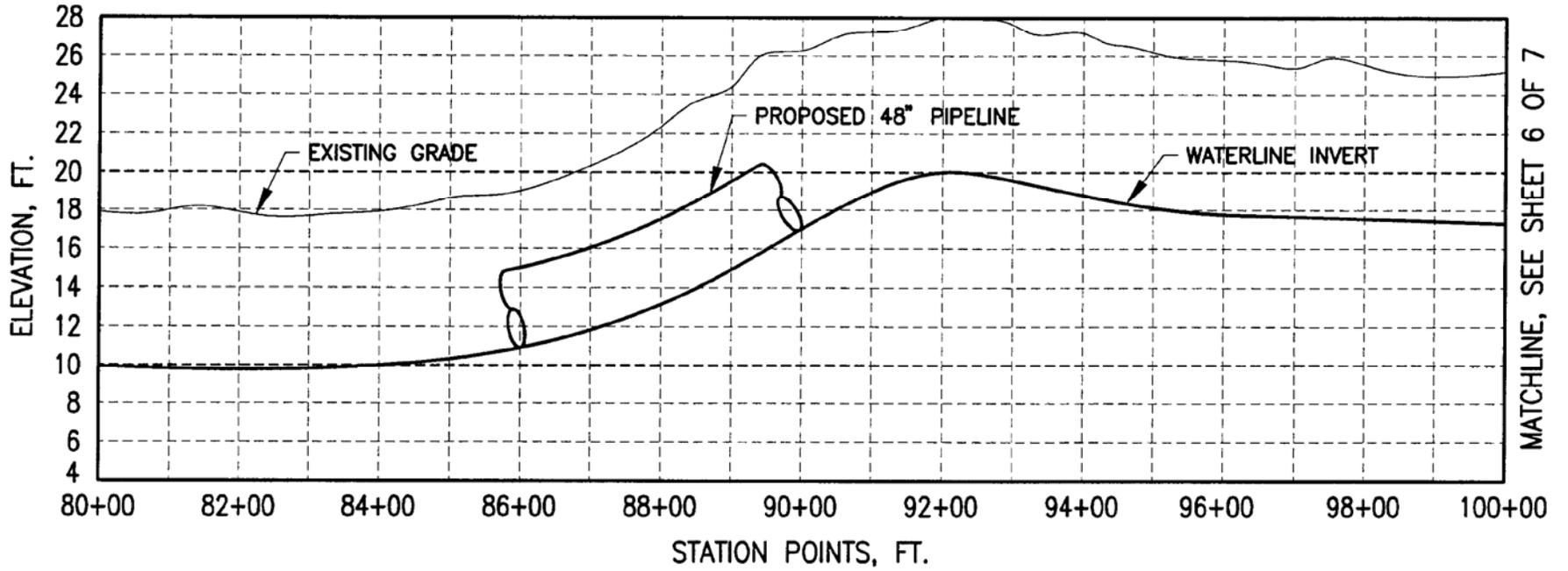
MATCHLINE, SEE SHEET 4 OF 7

PIPELINE PROFILE

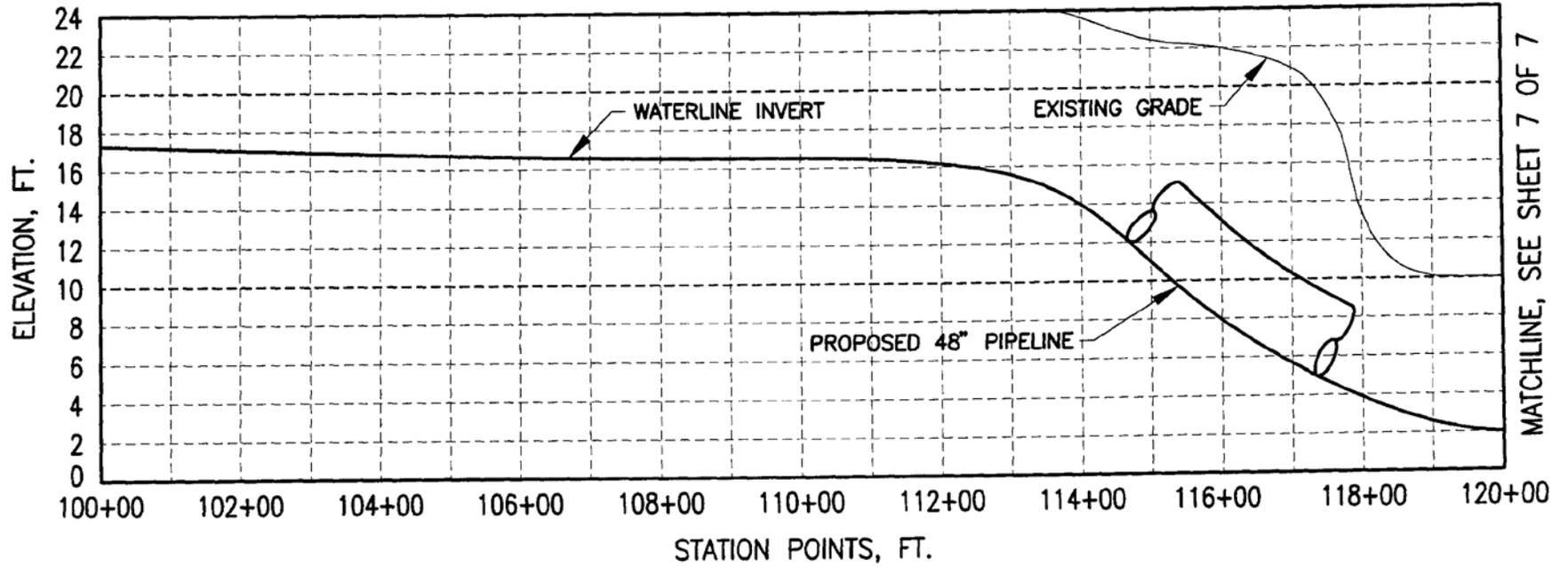


MATCHLINE, SEE SHEET 5 OF 7

PIPELINE PROFILE



PIPELINE PROFILE



PIPELINE PROFILE

