



# Midway Sewer District

3030 S. 240th St. Kent, WA 98038  
(206)824-4960

## Certificate of Sewer Availability

APPLICANT: \_\_\_\_\_ PHONE: \_\_\_\_\_  
PROPOSED USE: \_\_\_\_\_ EMAIL: \_\_\_\_\_  
LOCATION: \_\_\_\_\_  
LEGAL: \_\_\_\_\_

### 1. SEWER DISTRICT DETERMINATION:

- a. Sewer service can be provided by a side sewer connection only to an existing \_\_\_\_\_ size sewer \_\_\_\_\_ feet from the site and the sewer system has the capacity to serve the proposed use.

AND/OR

- b. Sewer service will require an improvement to the sewer system of:  
(1) \_\_\_\_\_ feet of sewer trunk or lateral to reach the site; and/or  
(2) the construction of a collection system on the site; and/or  
(3) other describe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 2. SEWER SERVICE IS SUBJECT TO THE FOLLOWING:

- a. Connection Charges: \_\_\_\_\_  
b. Easements: \_\_\_\_\_  
c. Other: \_\_\_\_\_

**THIS CERTIFICATE SHALL ONLY BE VALID FOR ONE (1) YEAR FROM DATE OF SIGNATURE**

I certify that the above Sewer District determination is correct.

MIDWAY SEWER DISTRICT

By:                       
Signature Date

\_\_\_\_\_  
Typed Name Title

\* \* \* \* \*

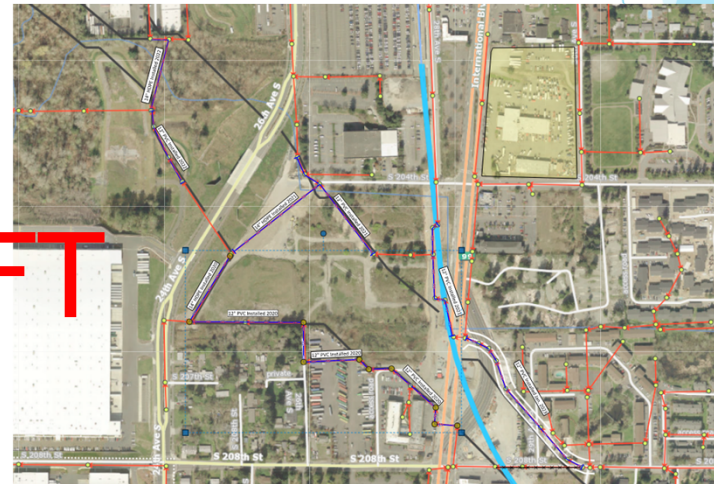
*\*\* This Certificate of Sewer Availability is valid only for the real property referenced herein for the sole purpose of submission to the appropriate building, engineering and/or health departments of other governmental agencies. This Certificate is between the District and the Applicant only, and cannot be assigned or transferred by any party. Further, no third party shall have any rights hereunder, whether by agency, as a third party beneficiary or otherwise.*

*\*\* The District makes no representations, express or implied, that the Applicant will be able to obtain the necessary permits, approvals, and authorizations from any governmental agency necessary before Applicant can utilize the utility service which is the subject of this Certificate.*

\* \* \* \* \*

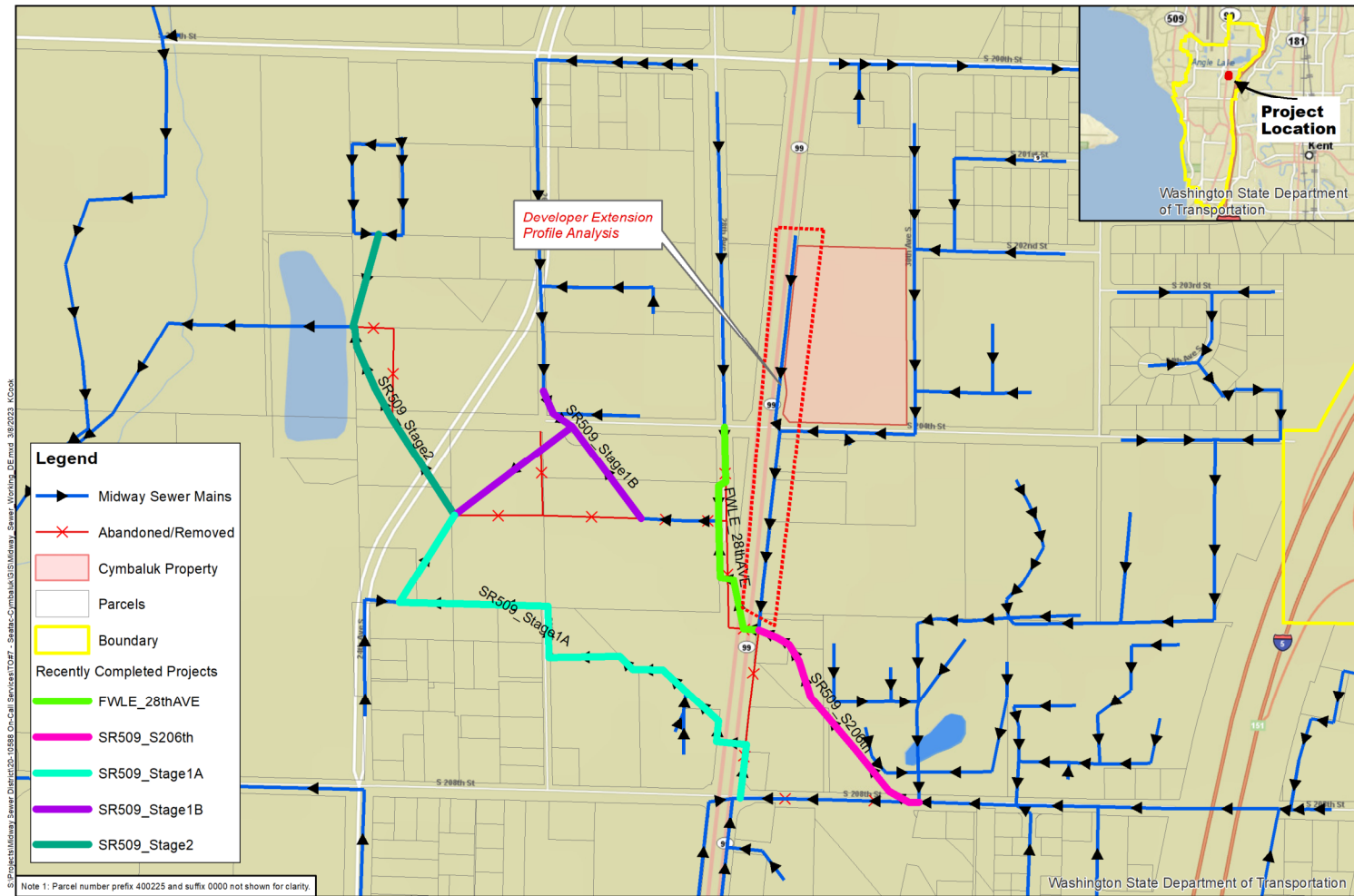
## A 3D architectural rendering of a modern building complex, featuring several interconnected rectangular volumes with dark, textured facades and flat roofs. The building is situated on a sloping terrain, with a road and parking area visible in the foreground. A large, bold red letter 'D' is overlaid on the right side of the image.

**DRAFT**



# Purpose and Background

- ▶ 7A - The District and its partners have completed (or are on track to complete) sanitary sewer upgrades in 2023. The District has identified five (5) projects to be included as part of their hydraulic model update and validation. These projects include;
  - ▶ SR 509 Sewer Relocation (July 2019)
  - ▶ SR 509 Sewer Relocations Phase 1-Stage 1B (July 2020)
  - ▶ SR 509 Phase 1 – Stage 2 Sewer Relocations Project (March 2022)
  - ▶ SR 509 Phase 1 – Stage 1B Sewer Relocation/Replacement Project (June 2022)
  - ▶ F200 Federal Way Link Extension (September 2020)
- ▶ 7B – The area on the northeast intersection of S 204<sup>th</sup> Street and International Boulevard is being considered for redevelopment. The initial proposal calls for 800 apartment units with 9,000 square feet of commercial space. Developer has requested a Certificate of Sewer Availability from the District.
  - ▶ Estimate full-occupancy wastewater flows; utilize the District’s hydraulic model to simulate added apartments and commercial space and usage flowing up to optimal discharge location for the following scenarios
    - ▶ 2023 Peak Day Flow
    - ▶ 2023 Peak Day Flow + Developer Extension
    - ▶ 2037 Peak Day Flow
    - ▶ 2037 Peak Day Flow + Developer Extension



Existing Sewer System: City of Lynden.  
 Base GIS Data: City of Lynden & Whatcom County.  
 This map is a geographic representation based on information available.  
 No warranty is made concerning the accuracy, currency, or completeness  
 of data depicted on this map.



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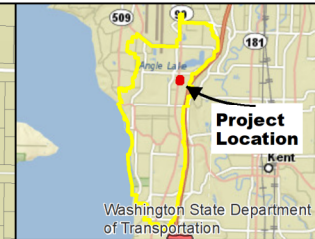
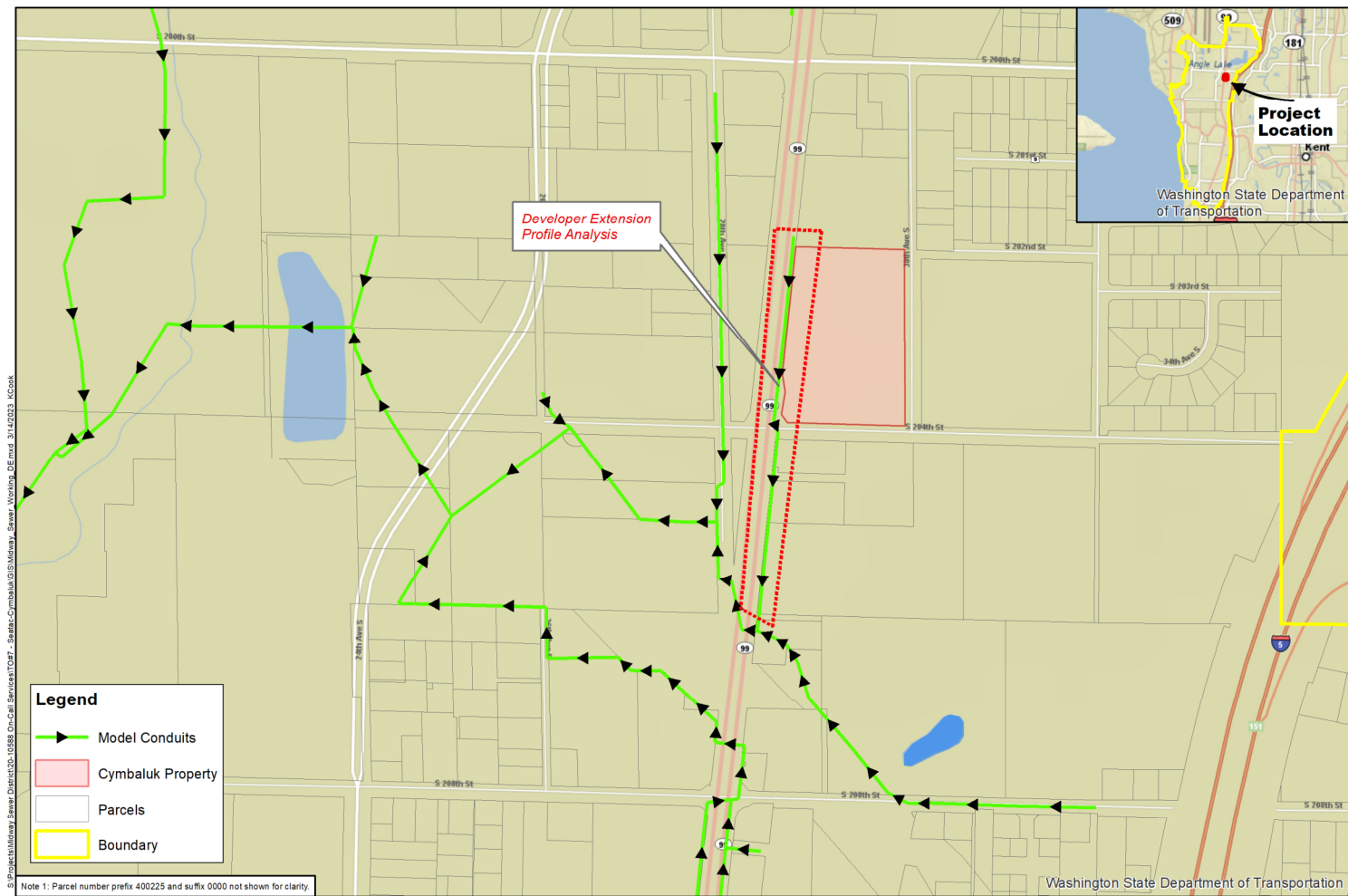
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**Study Area**  
 Developer Extension - Cymbaluk  
 Midway Sewer District  
 March 2023

Figure

**1**



Existing Sewer System: City of Lynden.  
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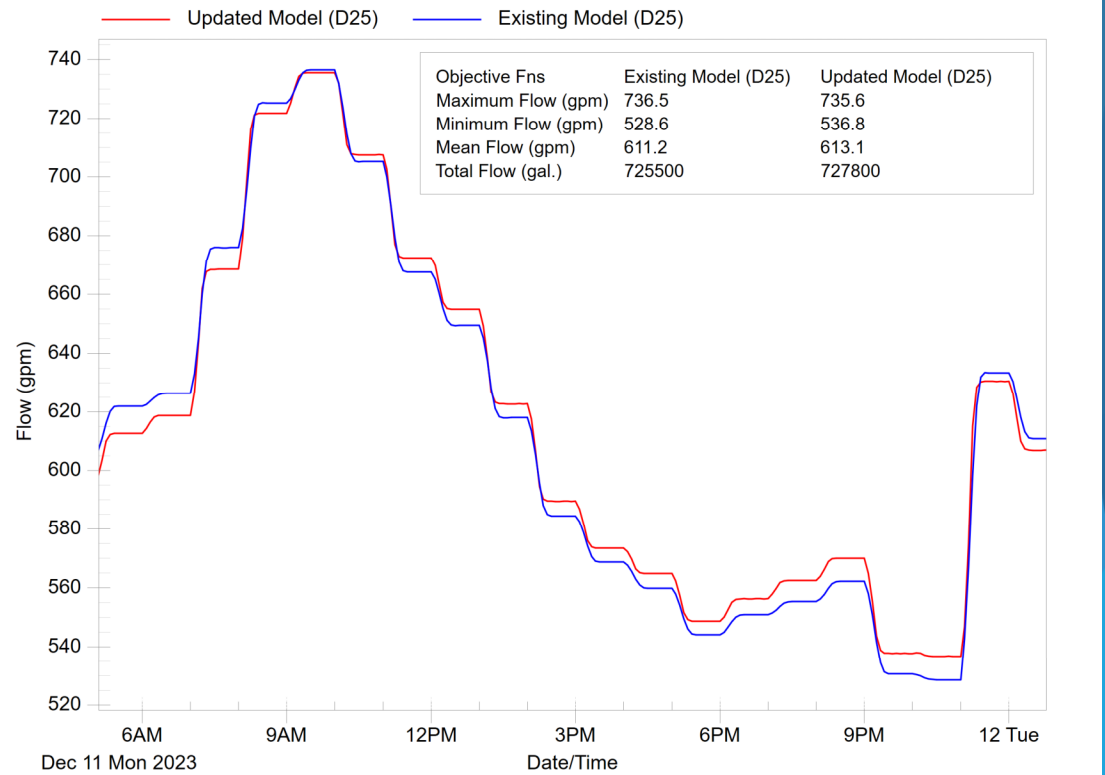
**Study Area**  
 Developer Extension - Cymbaluk  
 Midway Sewer District  
 March 2023

Figure

**2**

# Model Validation

Hydraulic model updated to reflect recently completed projects. Flows were re-allocated in the model to reflect new loading in the updated system. Model validation to flow in the system immediately downstream of the improvements was completed by comparing peak and total volume to ensure that all flows were accounted for.



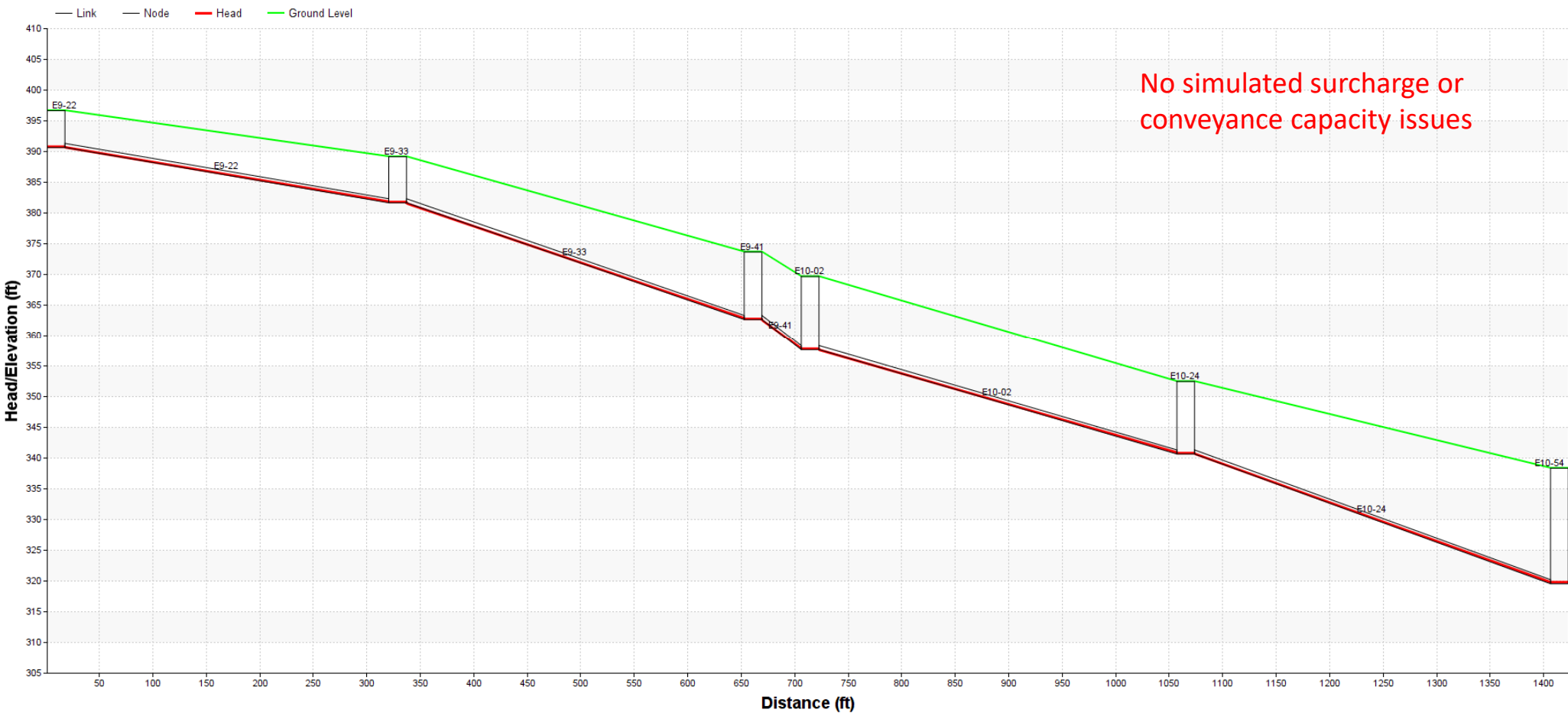
# Flow Projections – Method 1

- ▶ 800 Apartments + 9,000 sf Commercial Space
- ▶ Assumptions
  - ▶ 2.2 persons per unit occupancy
  - ▶ 56 gpd per capita (MSD Comprehensive Sewer Plan)
  - ▶ 250 gpd per 1,000 sf of commercial space (DOE Orange Book)
  - ▶ 2,050 gpd/acre of Inflow and Infiltration (I/I)
  - ▶ Entire Parcel Area (6.16 acres) Contributes to I/I
  - ▶ Existing diurnal patterns in model applied in methodology consistent with other loading
  - ▶ Flows Loaded to MH E9-33
- ▶ Calculations
  - ▶ Residential Flow:  $800 \text{ units} \times 2.2 \text{ persons per unit} \times 56 \text{ gpd per capita} = 98,560 \text{ gpd} = 68.4 \text{ gpm}$
  - ▶ Commercial Flow:  $9,000 \text{ sf} \times 250 \text{ gpd} / 1,000 \text{ sf} = 2,250 \text{ gpd} = 1.6 \text{ gpm}$
  - ▶ Inflow/Infiltration:  $2,050 \text{ gpd/ac} \times 6.16 \text{ ac} = 12,628 \text{ gpd} = 8.8 \text{ gpm}$
  - ▶ Total Average Peak Day Flow to Model = 75.9 gpm
  - ▶ Peak Day Flow (with diurnal pattern) to Model ~ 94.1 gpm



2023 Peak Day Flow

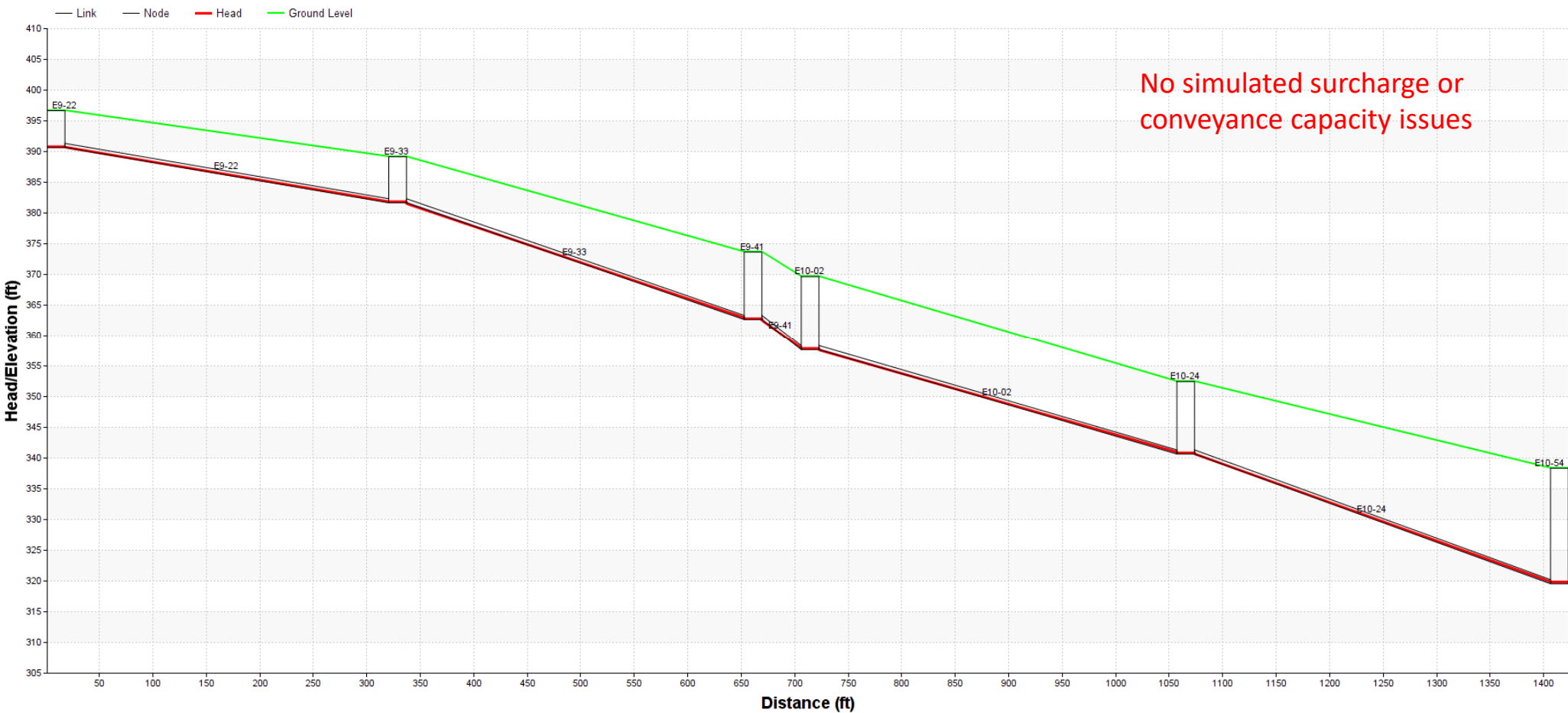
HGL Profile with Maximum Data of Links E9-22,E9-33,...,E10-24





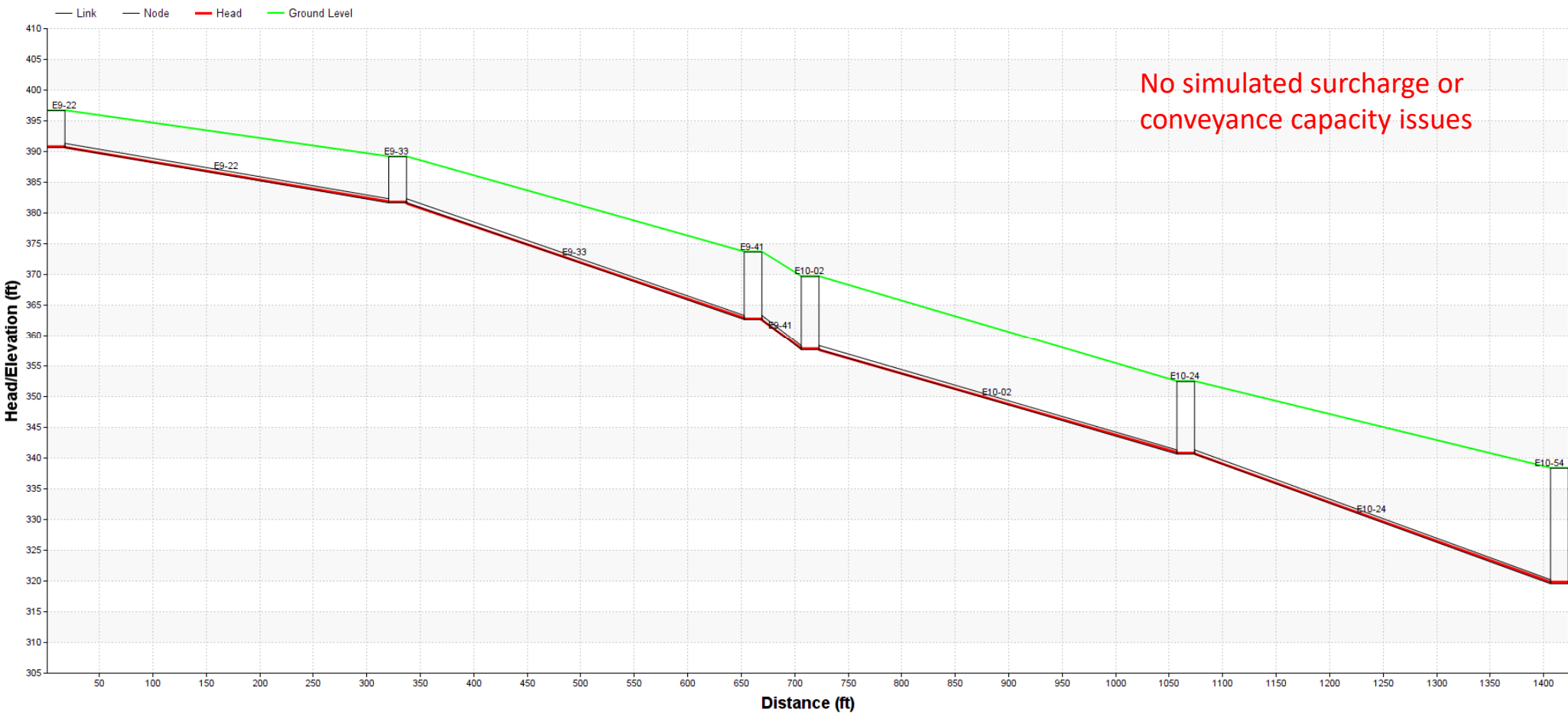
2023 Peak Day Flow with Developer Extension

HGL Profile with Maximum Data of Links E9-22,E9-33,...,E10-24



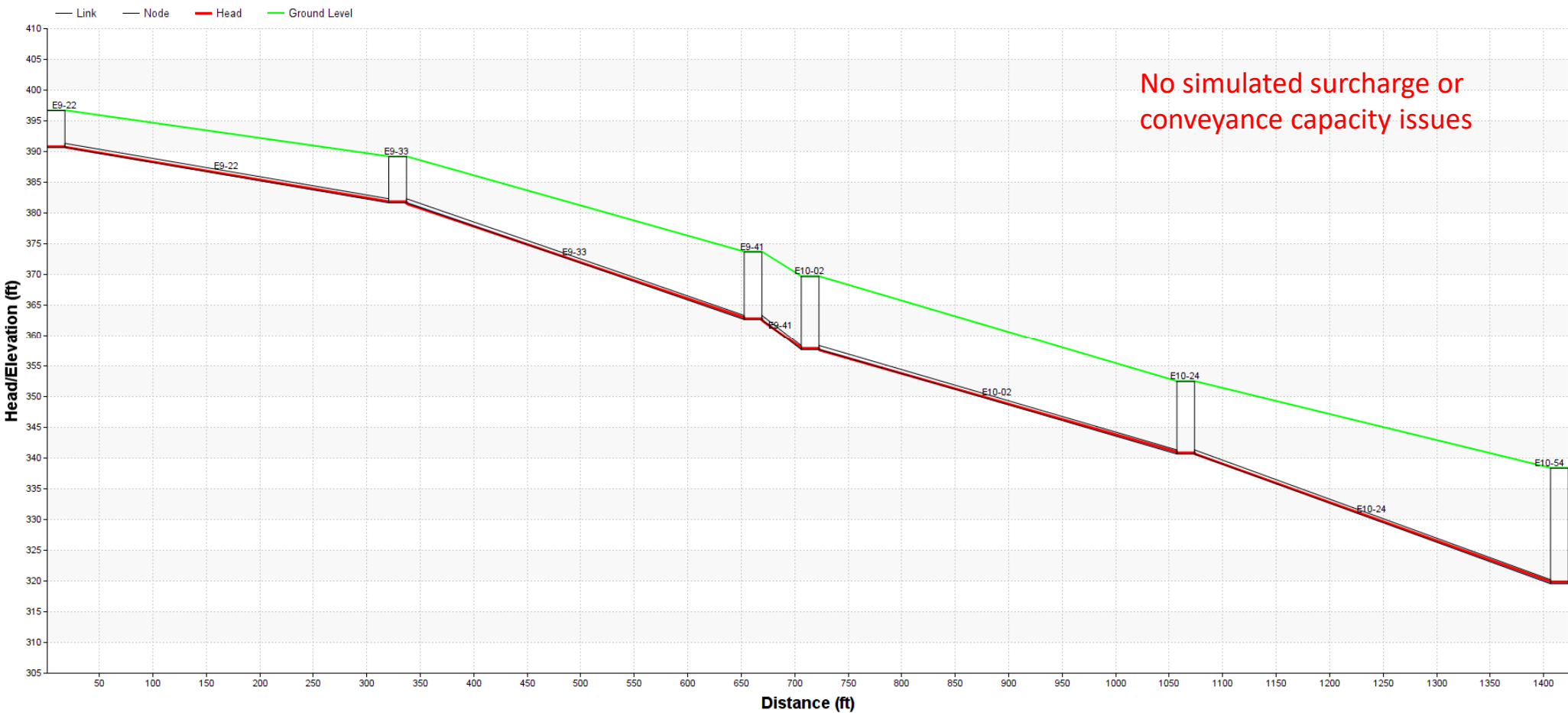
2037 Peak Day Flow

HGL Profile with Maximum Data of Links E9-22,E9-33,...,E10-24



2037 Peak Day Flow with Developer Extension

**HGL Profile with Maximum Data of Links E9-22,E9-33,...,E10-24**



# Model Summary of Results

Pipe Link	Simulated Peak Flow (gpm)				Max.Flow/Full Flow*				Max.Depth/Full Depth**			
	2023 PDF	2023 PDF + Dev Ext	2037 PDF	2037 PDF Dev Ext	2023 PDF	2023 PDF + Dev Ext	2037 PDF	2037 PDF Dev Ext	2023 PDF	2023 PDF + Dev Ext	2037 PDF	2037 PDF Dev Ext
E10-02	123.1	217.2	156.1	252.2	0.10	0.18	0.13	0.21	0.22	0.29	0.25	0.31
E9-22	74.8	74.8	94.9	94.8	0.08	0.08	0.11	0.11	0.20	0.24	0.22	0.26
E9-33	99.5	194.7	126.2	223.2	0.08	0.15	0.10	0.17	0.18	0.25	0.20	0.27
E9-41	102.0	197.0	129.3	226.1	0.05	0.10	0.07	0.12	0.19	0.26	0.21	0.28
E10-24	138.2	231.6	175.3	271.0	0.11	0.18	0.13	0.21	0.30	0.36	0.34	0.40

\*Ratio of the maximum simulated flow relative to the pipe full flow capacity e.g. Values > 1 indicate pipe is flowing above its capacity

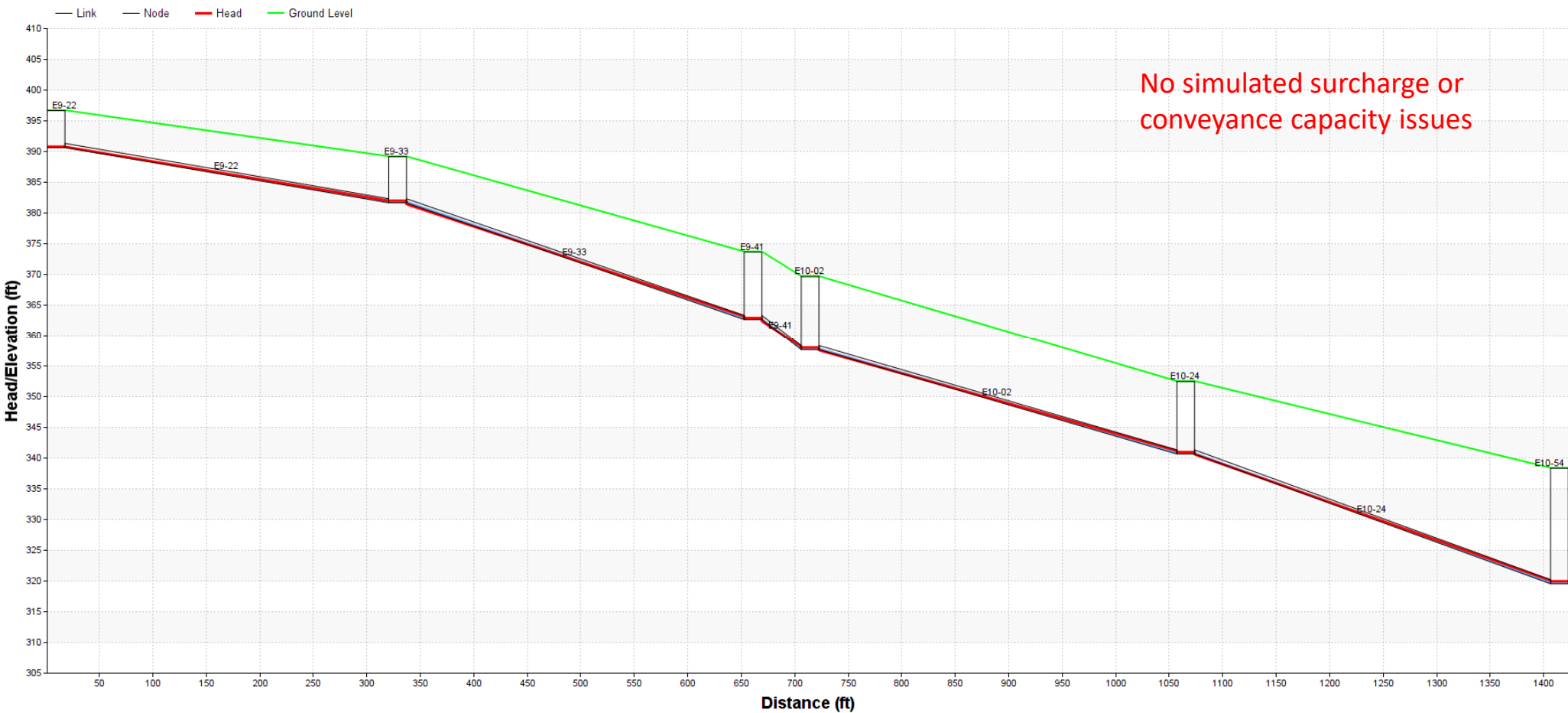
\*\*Ratio of the maximum simulated depth relative to the pipe full depth e.g. Values > 1 indicate pipe is surcharged

# Flow Projections - Method 2

- ▶ For very dense, localized analysis, a more conservative approach may be used to estimate peak flows given short travel times and distance from units to receiving sewer, and possibility of multiple users at once.
- ▶ 800 Apartments + 9,000 sf Commercial Space
- ▶ Assumptions
  - ▶ 2.2 persons per unit occupancy
  - ▶ 100 gpd per capita (DOE Orange Book)
  - ▶ 250 gpd per 1,000 sf of commercial space (DOE Orange Book)
  - ▶ 2,050 gpd/acre of Inflow and Infiltration (I/I)
  - ▶ Entire Parcel Area (6.16 acres) Contributes to I/I
  - ▶ Existing diurnal patterns in model applied in methodology consistent with other loading
    - ▶ Peak Factor of 3.63 from DOE Orange Book applied to Residential Loading for localized analysis
  - ▶ Flows Loaded to MH E9-33
- ▶ Calculations
  - ▶ Residential Flow:  $800 \text{ units} \times 2.2 \text{ persons per unit} \times 100 \text{ gpd per capita} = 176,000 \text{ gpd} = 122.2 \text{ gpm}$
  - ▶ Commercial Flow:  $9,000 \text{ sf} \times 250 \text{ gpd} / 1,000 \text{ sf} = 2,250 \text{ gpd} = 1.6 \text{ gpm}$
  - ▶ Inflow/Infiltration:  $2,050 \text{ gpd/ac} \times 6.16 \text{ ac} = 12,628 \text{ gpd} = 8.8 \text{ gpm}$
  - ▶ Peak Day Flow (with Orange Book Peaking Factor) to Model - 455 gpm

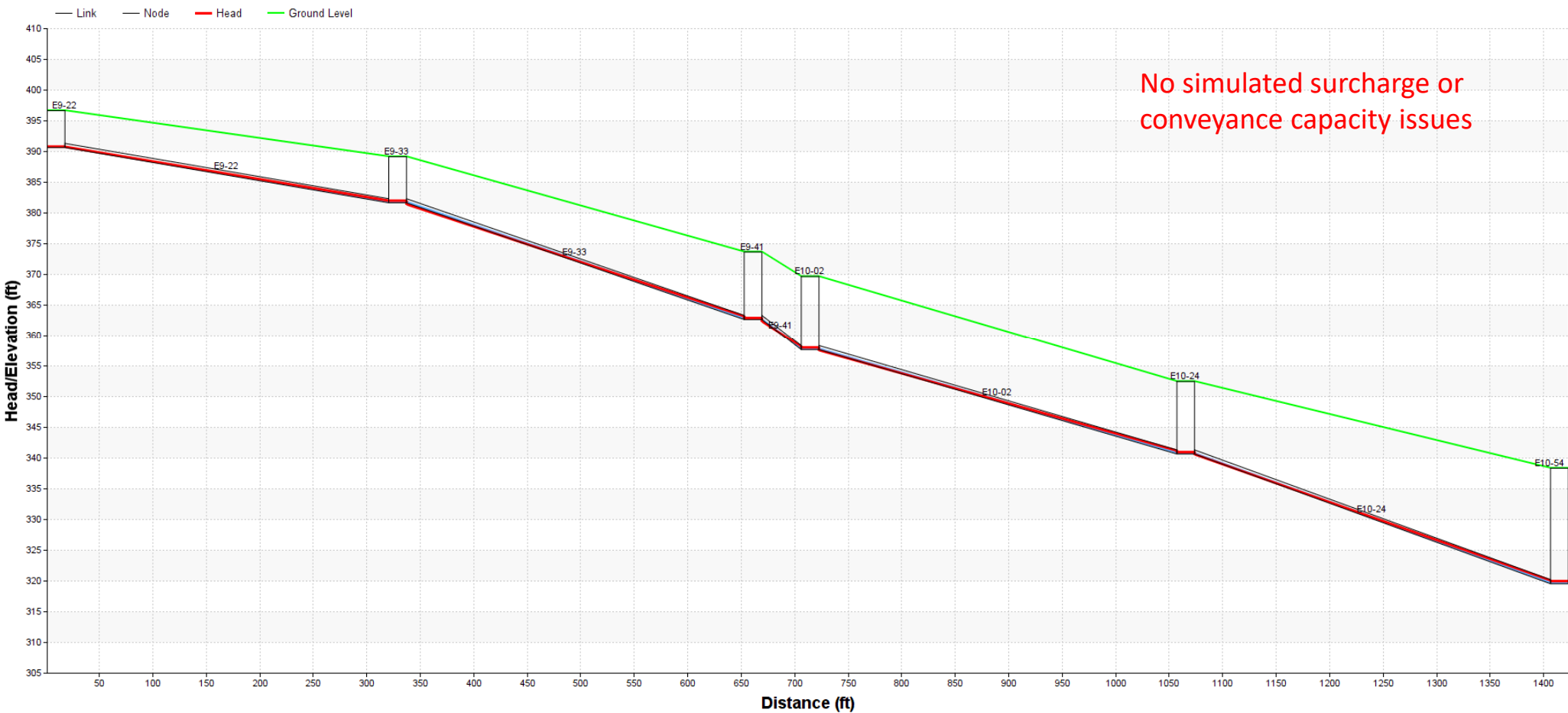
2023 Peak Day Flow with Developer Extension – Method 2

**HGL Profile with Maximum Data of Links E9-22,E9-33,...,E10-24**



2037 Peak Day Flow with Developer Extension – Method 2

**HGL Profile with Maximum Data of Links E9-22,E9-33,...,E10-24**





# Model Summary of Results

	Peak Flow (gpm)						Max.Flow/Full Flow*						Max.Depth/Full Depth**					
	2023 PDF	2023 PDF + Dev Ext	2037 PDF	2037 PDF Dev Ext	2023 PDF + Dev Ext (Method2)	2037 PDF + Dev Ext (Method2)	2023 PDF	2023 PDF + Dev Ext	2037 PDF	2037 PDF Dev Ext	2023 PDF + Dev Ext (Method2)	2037 PDF + Dev Ext (Method2)	2023 PDF	2023 PDF + Dev Ext	2037 PDF	2037 PDF Dev Ext	2023 PDF + Dev Ext (Method2)	2037 PDF + Dev Ext (Method2)
E10-02	123.1	217.2	156.1	252.2	575.4	608.4	0.10	0.18	0.13	0.21	0.49	0.52	0.22	0.29	0.25	0.31	0.49	0.51
E9-22	74.8	74.8	94.9	94.8	74.8	94.8	0.08	0.08	0.11	0.11	0.08	0.11	0.20	0.24	0.22	0.26	0.35	0.37
E9-33	99.5	194.7	126.2	223.2	558.3	578.5	0.08	0.15	0.10	0.17	0.44	0.45	0.18	0.25	0.20	0.27	0.43	0.45
E9-41	102.0	197.0	129.3	226.1	554.2	581.6	0.05	0.10	0.07	0.12	0.29	0.30	0.19	0.26	0.21	0.28	0.44	0.45
E10-24	138.2	231.6	175.3	271.0	590.5	627.6	0.11	0.18	0.13	0.21	0.45	0.48	0.30	0.36	0.34	0.40	0.54	0.57

\*Ratio of the maximum simulated flow relative to the pipe full flow capacity e.g. Values > 1 indicate pipe is flowing above its capacity

\*\*Ratio of the maximum simulated depth relative to the pipe full depth e.g. Values > 1 indicate pipe is surcharged

# Result Summary

- ▶ The District's sewer model was updated and validated to include recently completed projects in the study area vicinity.
- ▶ Based on the hydraulic modeling analysis, the modeled pipes adjacent to the proposed property development have sufficient capacity to support developer connection based on estimated flows for both Method 1 and 2.
  - ▶ The 8-in receiving sewer does not have a large contributing area upstream of the model connection point, and ties into a recently constructed 12-inch sewer downstream.
  - ▶ Conservative estimates in Method 2 accounting for a more localized analysis for the new development do not show simulated capacity or surcharging, that are consistent with the qualitative results of Method 1, suggesting no adverse effects on the immediate sewer system analyzed.
- ▶ For the pipes analyzed, the shallowest 8-in pipe that would have the lowest theoretical full capacity would be able to convey roughly 900 gpm (via Manning's equation). This is below the simulated peak flows for all scenarios in the model.

# Result Summary

- ▶ Previous assumptions for planning horizons and flow developments from the District's previous comprehensive sewer planning efforts were assumed to be valid for the purposes of this analysis. These include distribution of flow loadings, I/I values, and estimated developments.
- ▶ Evaluation of hydraulic conveyance capacity was limited to the pipes in the model adjacent to the property up to the recently constructed conveyance improvements.
  - ▶ It is assumed that the recently completed projects have sufficient hydraulic capacity to support this analysis.
  - ▶ No analysis on hydraulically connected areas or downstream receiving system beyond the highlighted profile extent was completed.
  - ▶ The model is truncated and pipes extending east and then north from 204<sup>th</sup> and International Blvd are not in the model. Flows may be distributed to different points in the system for multiple building properties. It is assumed that the unmodeled pipes in this area have sufficient capacity to convey a portion of any distributed flows.
- ▶ Changes to apartment type in terms of units or density could impact availability of capacity based on updated flow projections. Other changes to assumptions used in development of flows would also impact available capacity.
- ▶ Simulated model results are based upon the best information available at the time and build off previous assumptions. Model results should be validated and confirmed against field data as needed.