



HICKORY HAVEN AND SAMARY FOREST SEWER FEASIBILITY STUDY

10/13/17

BACKGROUND AND UNDERSTANDING

The Hickory Haven and Samary Forest Subdivisions were constructed during the 1950s with the parcels having private septic drainfields. Some of the original drainfields are reaching the end of their useful life and some homeowners have had to resort to costly repairs to maintain use of their home. The previous County Administration agreed to study extending public sewer to the existing subdivisions once the adjacent Readers Branch property was developed. With a new development in the planning phase, the County enlisted Timmons Group to investigate the feasibility of connecting approximately 57 existing homes to public sewer.

FEASIBILITY STUDY

This feasibility study is based on County provided as-built plans and GIS information to analyze options for extending gravity sewer into the existing subdivisions not currently served. It is important to note that the scope of this study did not include a comprehensive field topographic survey or the actual field location of existing drainfields and house laterals. The following observations and recommendations will require revisions once more conclusive field information is obtained.

The existing public wastewater utilities near the subdivisions consist of a 12"-15" trunk sewer that was designed as part of the Tuckahoe Creek Service District Utilities Sanitary Sewer Project and runs from northwest to southeast predominantly along the southern side of Readers Branch Creek; to the south of the existing subdivision. There is also a 21" gravity sewer that runs from north to south along the western side of Tuckahoe Creek; to the east of the existing subdivision. The 15" and 21" sewers join near the confluence of Readers Branch Creek and Tuckahoe Creek; southeast of the existing subdivision. Both gravity sewers convey flows to the County's Eastern Goochland Pump Station.

The existing gravity sewer capacity was not specifically evaluated as part of this study because sanitary sewer calculations were performed as part of Phase I of the Tuckahoe Creek Service District Utilities Sanitary Sewer Project. Projected flows from the existing Hickory Haven and Samary Forest subdivisions were included in the hydraulic analysis performed with the trunk sewer design. Based on a review of the trunk sewer as-built plans, it was determined that the existing 12" sewer and downstream facilities have adequate capacity to serve the existing residences.

After evaluating the current gravity sewer infrastructure and topography, it appears that 10 undeveloped parcels on the east side of Samary Forest could potentially connect via gravity to the existing 21" sewer located east of the subdivision along Tuckahoe Creek and for the purposes of this evaluation it



is assumed those property owners would connect as needed once homes are built (the cost of those 10 connections is not included the Opinion of Probable Cost provided below).

In order to serve the existing residences in Hickory Haven and Samary Forest, the majority of the proposed gravity sewer within the existing subdivisions is located in the existing road right-of-way. Offsite gravity sewer will need to be extended by others from the existing public gravity sewer, through the Readers Branch property, and terminate at the Hickory Haven and Samary Forest property boundaries. The exact routing of the offsite Readers Branch gravity sewer and its connection points to the existing public gravity sewer will be determined during the design phase of that development. This study based the offsite Readers Branch gravity sewer alignment solely on existing topography due to limited information on the layout of future development.

The conceptual design includes the construction of 8" gravity sewers since this is the minimum allowable public sewer diameter and is more than sufficient to convey the projected flows. In general, the conceptual sewer depth was limited to no more than 16' feet deep. The maximum allowable invert elevations for the Readers Branch gravity sewer are shown at manhole S3 for Hickory Haven and S25 for Samary Forest on the attached Feasibility Study Plan and Profile sheets.

GRAVITY SEWER CONCEPTUAL LAYOUT

Based on discussions with County staff, a review of available property owner information and existing utility easements, and after analyzing several alignment options, it was determined that locating the proposed gravity sewer within the existing subdivisions in the existing road right-of-way was the most feasible approach. This would minimize land disturbance on private property and maximize accessibility although it would impact travel along the roads during construction and would require more extensive pavement replacement for the entire roadway width for the areas impacted by construction.

Plan and profile views of the conceptual sewers are shown on the attached Feasibility Study Plan and Profile sheets U-1 through U-8. The conceptual alignment for Hickory Haven connects to the existing 12" gravity sewer at County manhole #226 in the Readers Branch property and extends northeast through the undeveloped parcel 58-3-A-7-0 to the intersection of Holly Lane and Oak Lane. Sewer then extends west and east along Holly Lane, north along Oak Lane, north along Birch Road, and east and north along Cedar Circle. The offsite sewer consists of approximately 320' of 8" pipe with 3 new manholes and the portion of sewer within the existing subdivision consists of approximately 3,210' of 8" pipe with 16 new manholes.

The conceptual alignment for Samary Forest connects to the existing 12" gravity sewer at County manhole #224 in the Readers Branch property. It extends east through the undeveloped lot 58-2-0-9-0, also a Readers Branch property, to within the right-of-way then branches north and south along Whippoorwill Road. The offsite sewer consists of approximately 1,590' of 8" pipe with 6 new manholes



and the portion of sewer within the existing subdivision consists of approximately 1,520' of 8" pipe with 6 new manholes.

Once a topographic survey is completed, the proposed sewer alignments can be shifted in the roadway to increase constructability and to account for parcel specific needs such as homes with basements and deeper sewer lateral connection requirements, where practical.

Based on the conceptual layout, the County will need to acquire at least two easements within the existing Hickory Haven and Samary Forest subdivisions to construct and maintain the sewers. We recommend the County plan to utilize the services of an easement acquisition professional to help prepare plats and obtain these easements during the design phase. At this time, it is unknown how many easements will be required for the portions of sewer through the Readers Branch property although we recommend the County require the Developer to provide the necessary easements.



OPINION OF PROBABLE COST

Item No.	Description	Unit	Unit Price	Quantity	Subtotal
1	Pavement Demolition	S.Y.	\$25	2700	\$67,500
2	Select Backfill (Trench L x W x 1' Stone Bedding)	C.Y.	\$65	550	\$35,750
3	1' Thick Pavement Replacement (Trench L x (W+2'))	S.Y.	\$75	2700	\$202,500
4	Pavement Milling (20' Wide)	S.Y.	\$10	9650	\$96,500
5	2" Thick Pavement Overlay (20' Wide)	S.Y.	\$15	9650	\$144,750
6	Grading, Seeding, and Strawing Trenches (10' Wide)	S.Y.	\$15	500	\$7,500
7	Excavation & Backfill 8" 6'-8' Deep	L.F.	\$25	930	\$23,250
8	Excavation & Backfill 8" 8'-10' Deep	L.F.	\$28	560	\$15,680
9	Excavation & Backfill 8" 10'-12' Deep	L.F.	\$31	920	\$28,520
10	Excavation & Backfill 8" 12'-14' Deep	L.F.	\$35	1800	\$63,000
11	Excavation & Backfill 8" 14'-16' Deep	L.F.	\$40	520	\$20,800
12	Standard Manholes	V.F.	\$700	260	\$182,000
13	Manhole Frame and Cover	EA.	\$800	24	\$19,200
14	Furnish & Install 8" Sewer	L.F.	\$60	4730	\$283,800
15	Furnish & Install 8"x4" Service Tee	EA.	\$400	57	\$22,800
16	Excavation & Backfill for 4" Service Pipe (Service Tee to Clean Out)	L.F.	\$20	1425	\$28,500
17	Furnish & Install 4" PVC Sewer Pipe (Service Tee to Clean Out)	L.F.	\$30	1425	\$42,750
18	Furnish & Install 4" PVC Clean Out	EA.	\$300	57	\$17,100
19	Excavation & Backfill for 4" Service Pipe (Clean Out to Existing Drain)	L.F.	\$20	4700	\$94,000
20	Furnish & Install 4" PVC Sewer Pipe (Clean Out to Existing Drain)	L.F.	\$30	4700	\$141,000
21	E/One Pump Station and Force Main	EA.	\$12,000	10	\$120,000
22	Septic Tank Abandonment	EA.	\$1,500	57	\$85,500
23	Budget for Mobilization	L.S.	\$30,000	1	\$30,000
Subtotal					\$1,772,400
10% Construction Contingency					\$177,240
5% for Traffic Control					\$88,620
20% for Survey, Engineering, Permitting, Administrative, and Easement Acquisition Services					\$354,480
Total Opinion of Probable Cost					\$2,392,740

Notes:

a. Construction costs are based on our best judgment, experience and being qualified professionals generally familiar with the construction industry. Because Timmons Group has no control over the cost of labor, materials, equipment, services furnished by others, competitive bidding, or market conditions, Timmons Group cannot guarantee that actual construction costs will not vary from the estimate presented.

b. Costs associated with the Readers Branch Development portion of sewer are not included in this estimate.

SUMMARY

The layout presented will need to be weighed by the County and the neighborhood and discussed with the various stakeholders (i.e. VDOT). Construction activities would disrupt travel along the roads impacted but it would also limit impacts to private property and could likely be constructed quicker and with less overall risk. Another benefit to the County is the ease of maintenance access or repair with the sewer located in the road right-of-way. One of the many benefits of this sewer layout for residents is that VDOT will require any construction within the road to install new asphalt from one side of the road to the



other (edge-of-pavement to edge-of-pavement) which will heighten the overall aesthetics of the neighborhood.

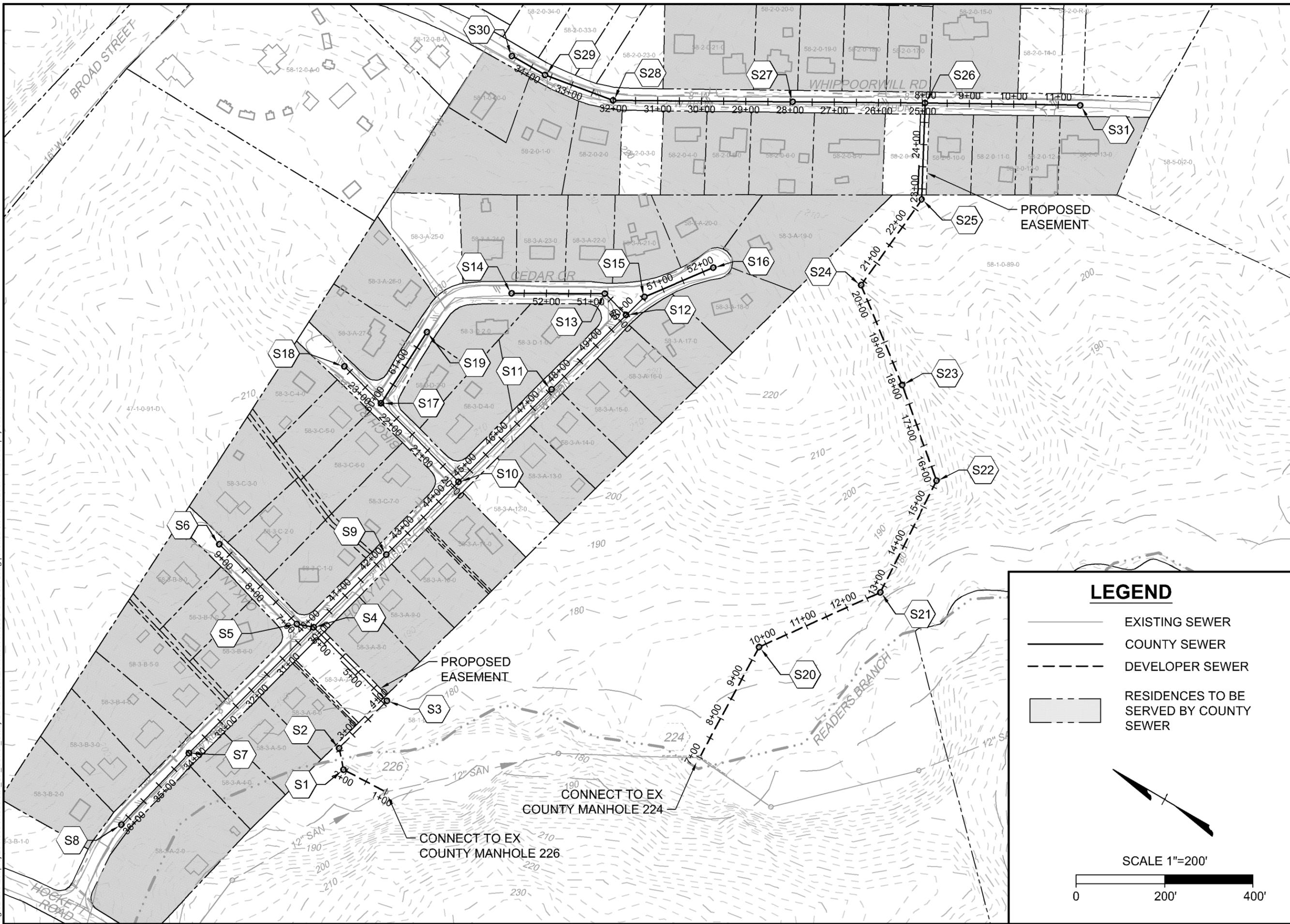
Note that we did review the available records provided by the Health Department for the existing drainfield locations. There are several residences that have a drainfield downhill from the street. It may not be possible for some of those residences to connect to the public system by gravity alone without constructing an excessively deep public sewer. Approximately 5-10 residences south of Holly Lane, East of Oak Lane, west of Birch Road, and east of Whippoorwill Road may require a private pump station and force main in order for them to connect to the proposed sewer and there may be others required once a topographic survey is completed and the existing drainfields and house laterals have been field located.

The addition of a private pump station and force main could represent an additional cost of \$8,000-\$12,000 for each parcel that cannot connect via gravity to the proposed sewer and this will need to be evaluated further during the design phase. The County will need to determine if the costs for these private facilities will be borne by the County or the property owner.

We recommend the County plan to utilize the services of an easement acquisition professional to help obtain any required permanent utility or temporary construction easements identified during the design phase. Note that the Opinion of Probable Cost includes a budget for easement acquisition services but not the cost of the easements. The County intends to have residents provide easements free of charge.

Timmons Group is a multi-disciplined consulting firm that provides survey, engineering design, easement acquisition, construction administration, and construction inspection services required to take this project from concept to completion.

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LEGEND

- EXISTING SEWER
- COUNTY SEWER
- DEVELOPER SEWER
- RESIDENCES TO BE SERVED BY COUNTY SEWER

SCALE 1"=200'

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 TEL 804.200.6500 FAX 804.560.1016 www.timmons.com

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10/13/17

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J. MARSHALL

DESIGNED BY
B. STRICKLAND

CHECKED BY
W. HUNNIUS

SCALE
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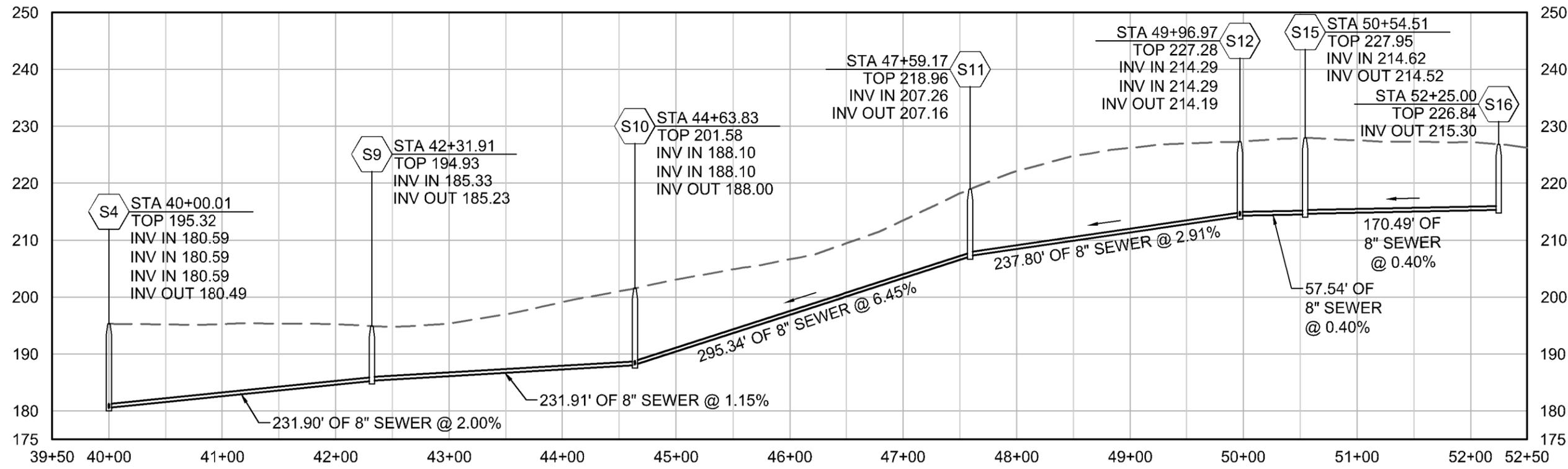
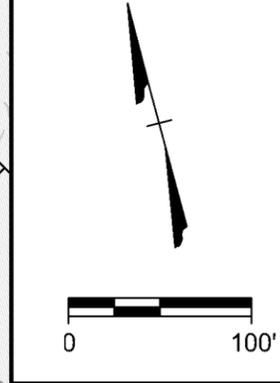
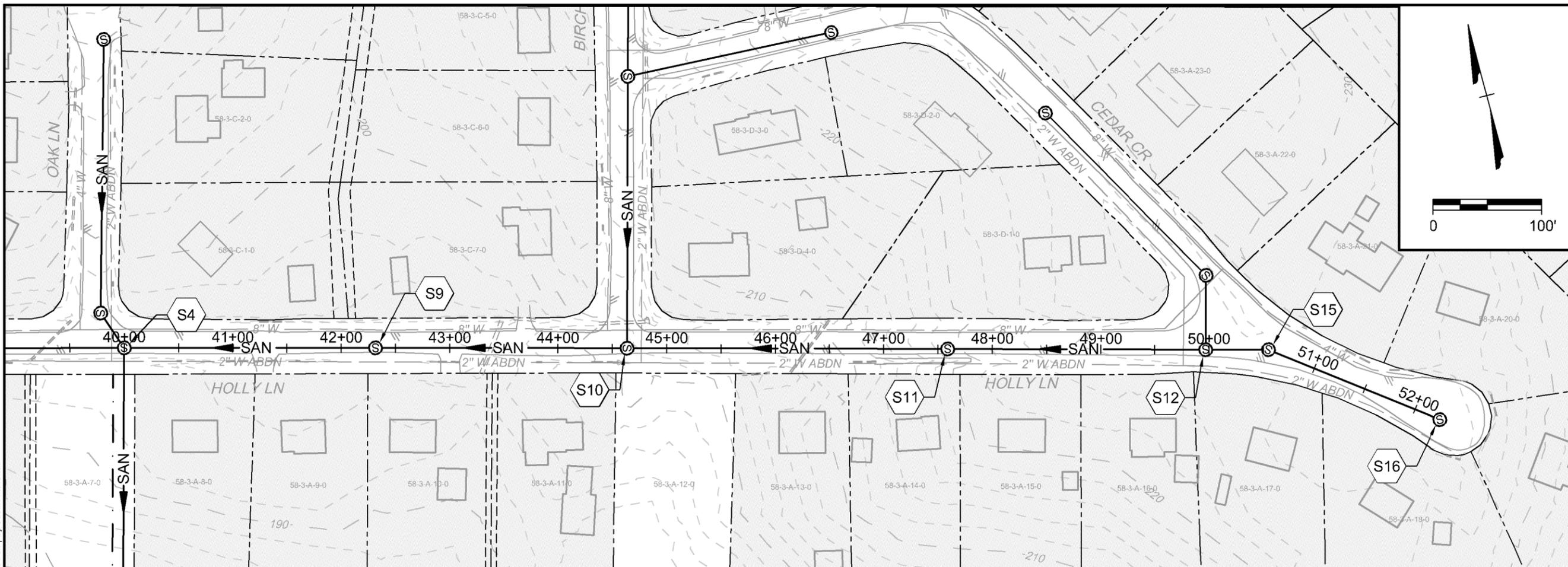
FEASIBILITY STUDY
 GOCHLAND COUNTY - VIRGINIA
 OVERALL SEWER LAYOUT

JOB NO.
33947.033

SHEET NO.
U-1

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HOLLY LANE EAST

FEASIBILITY STUDY

GOCHLAND COUNTY - VIRGINIA
HOLLY LANE EAST

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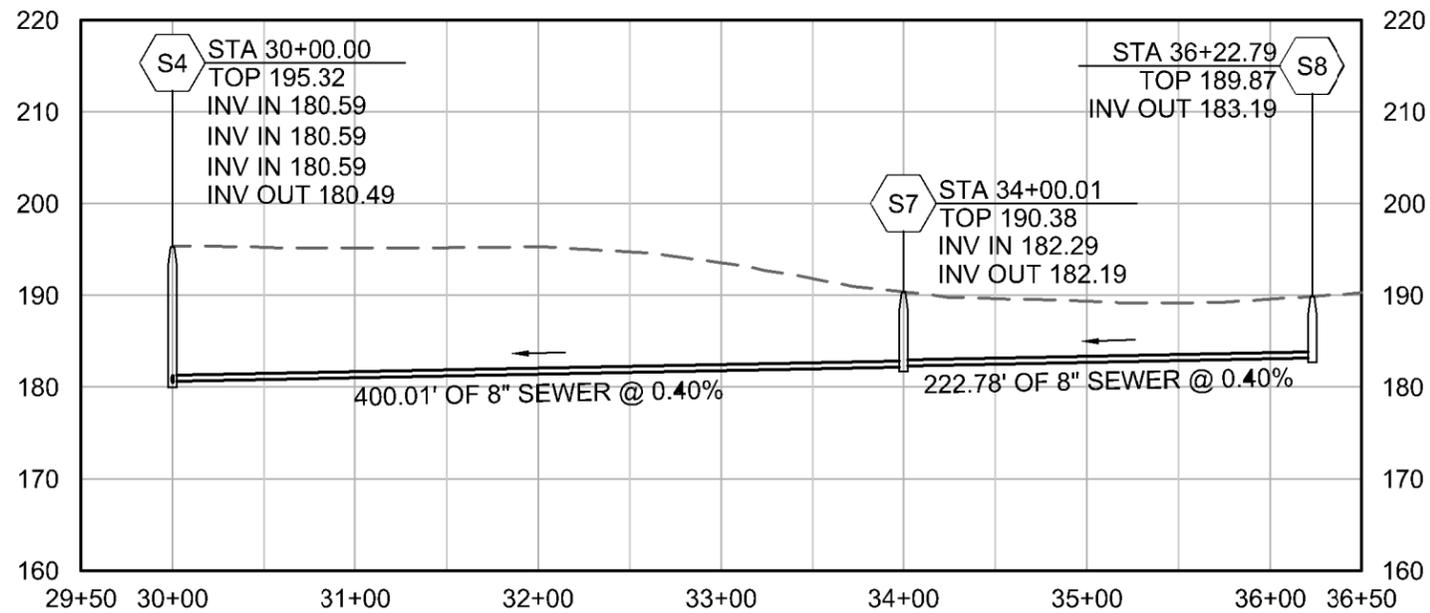
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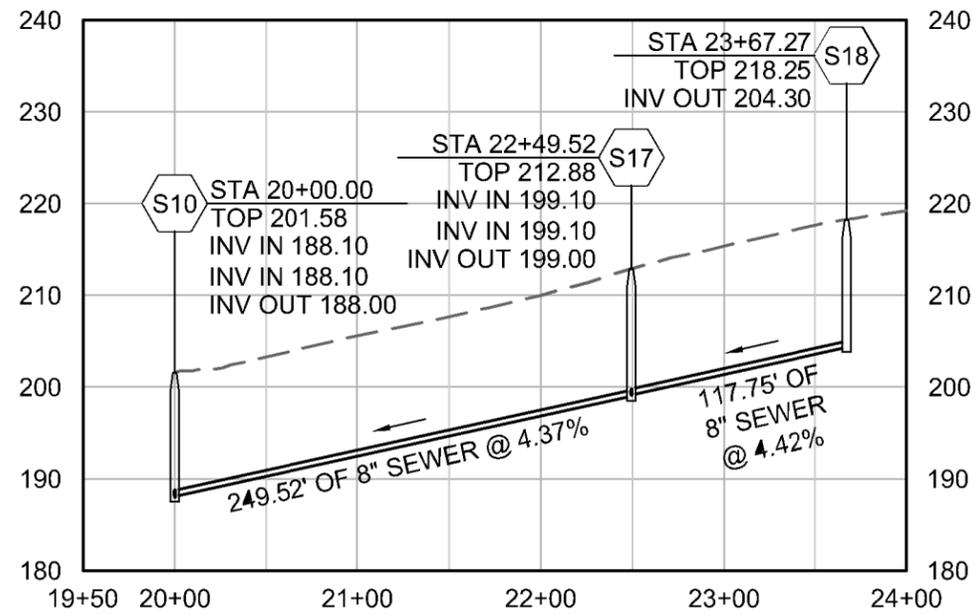
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HOLLY LANE WEST



BIRCH ROAD

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GOCHLAND COUNTY - VIRGINIA
HOLLY LANE WEST

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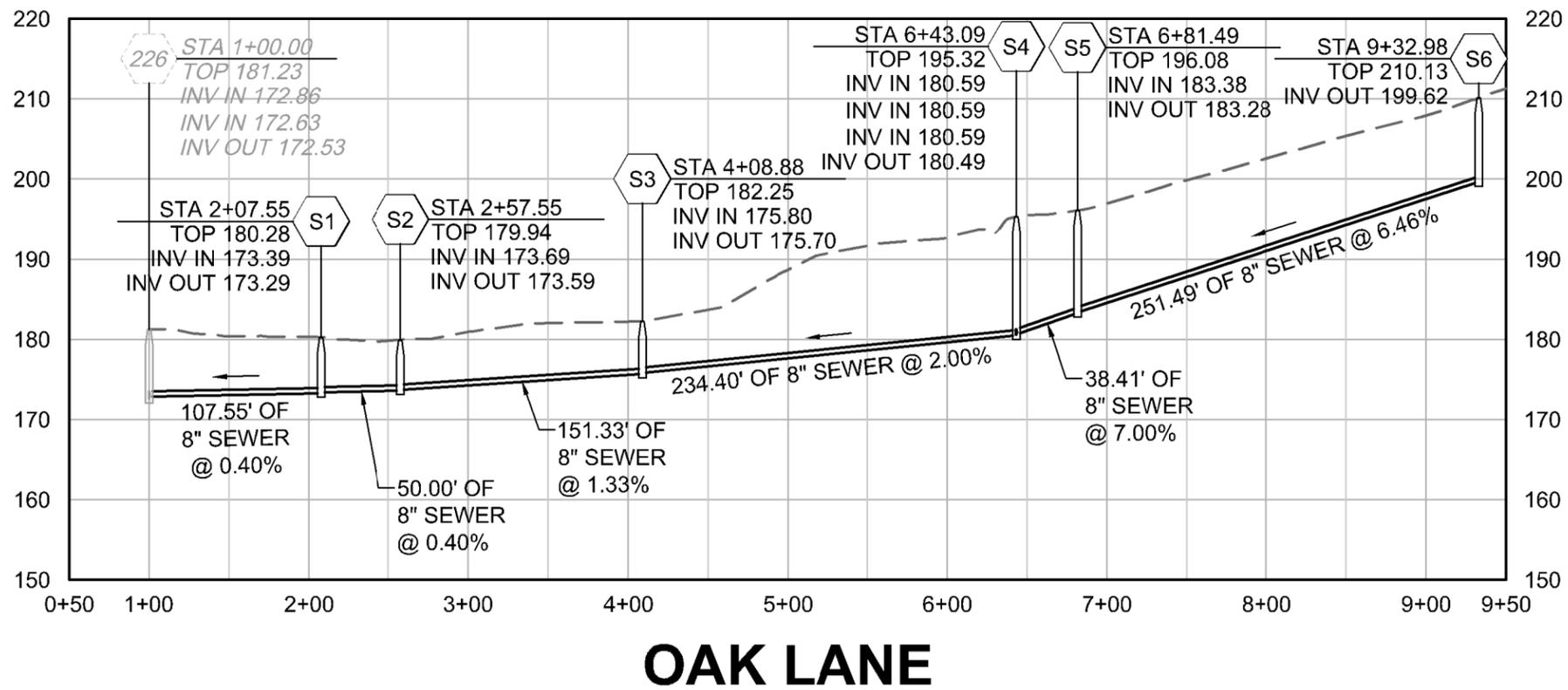
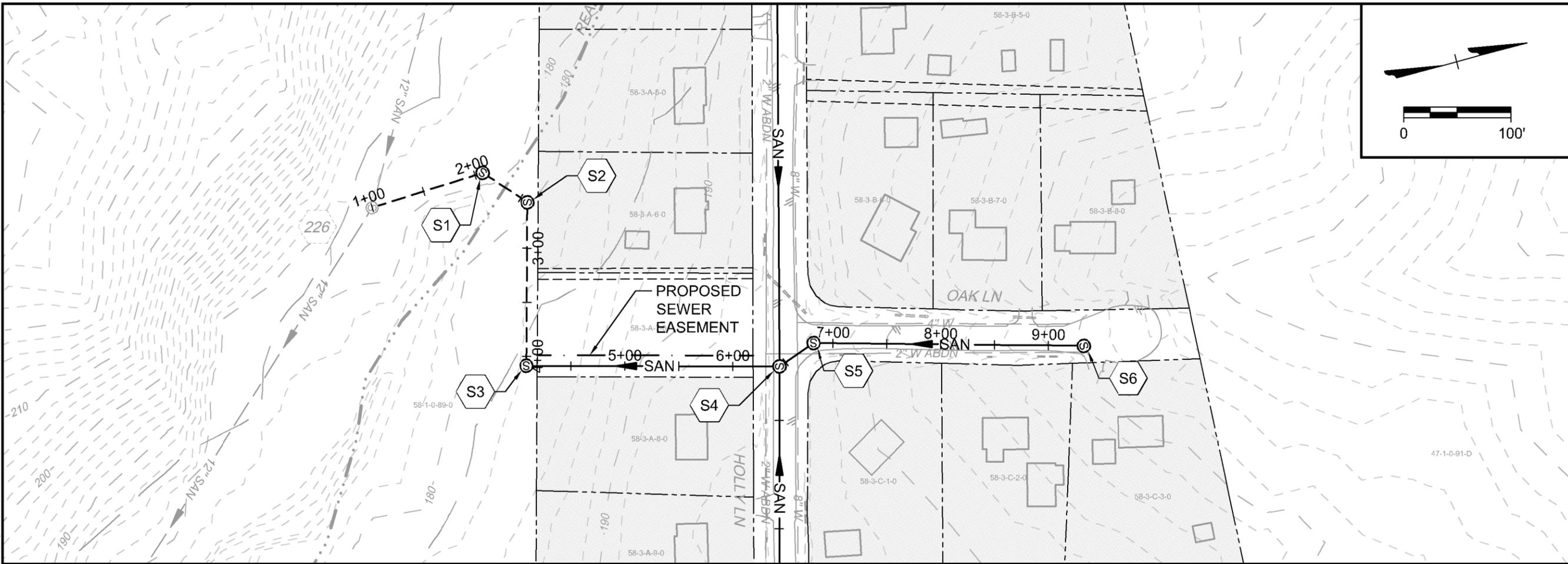
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OAK LANE

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GOOCHLAND COUNTY - VIRGINIA
OAK LANE

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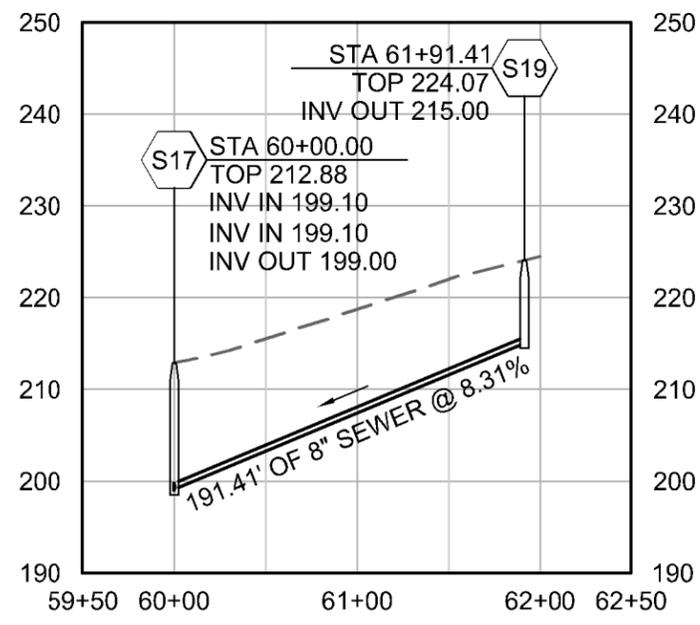
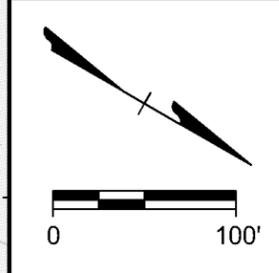
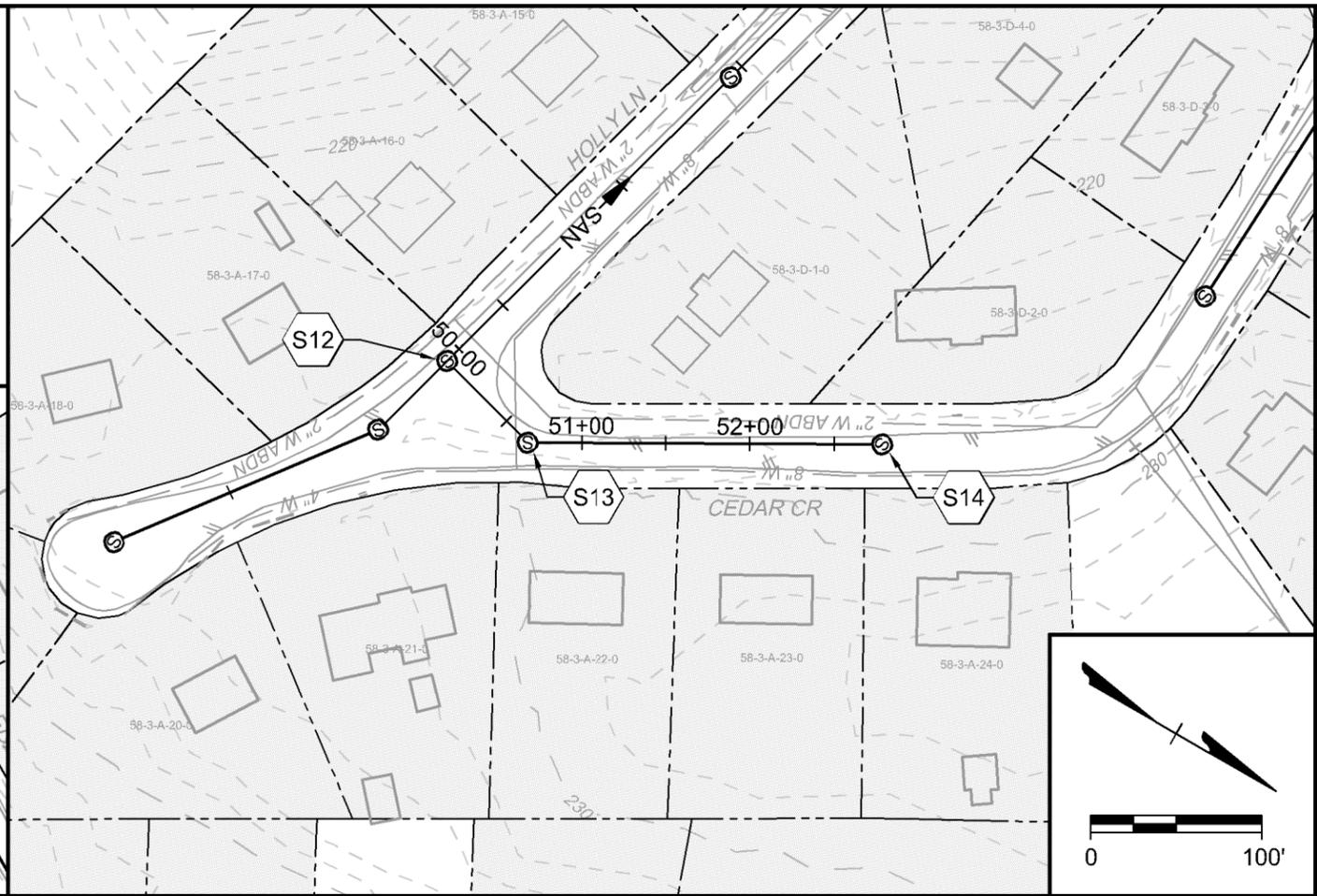
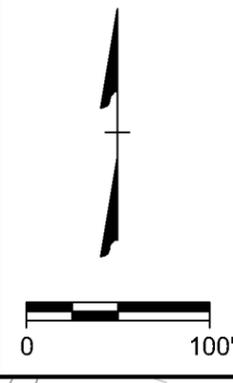
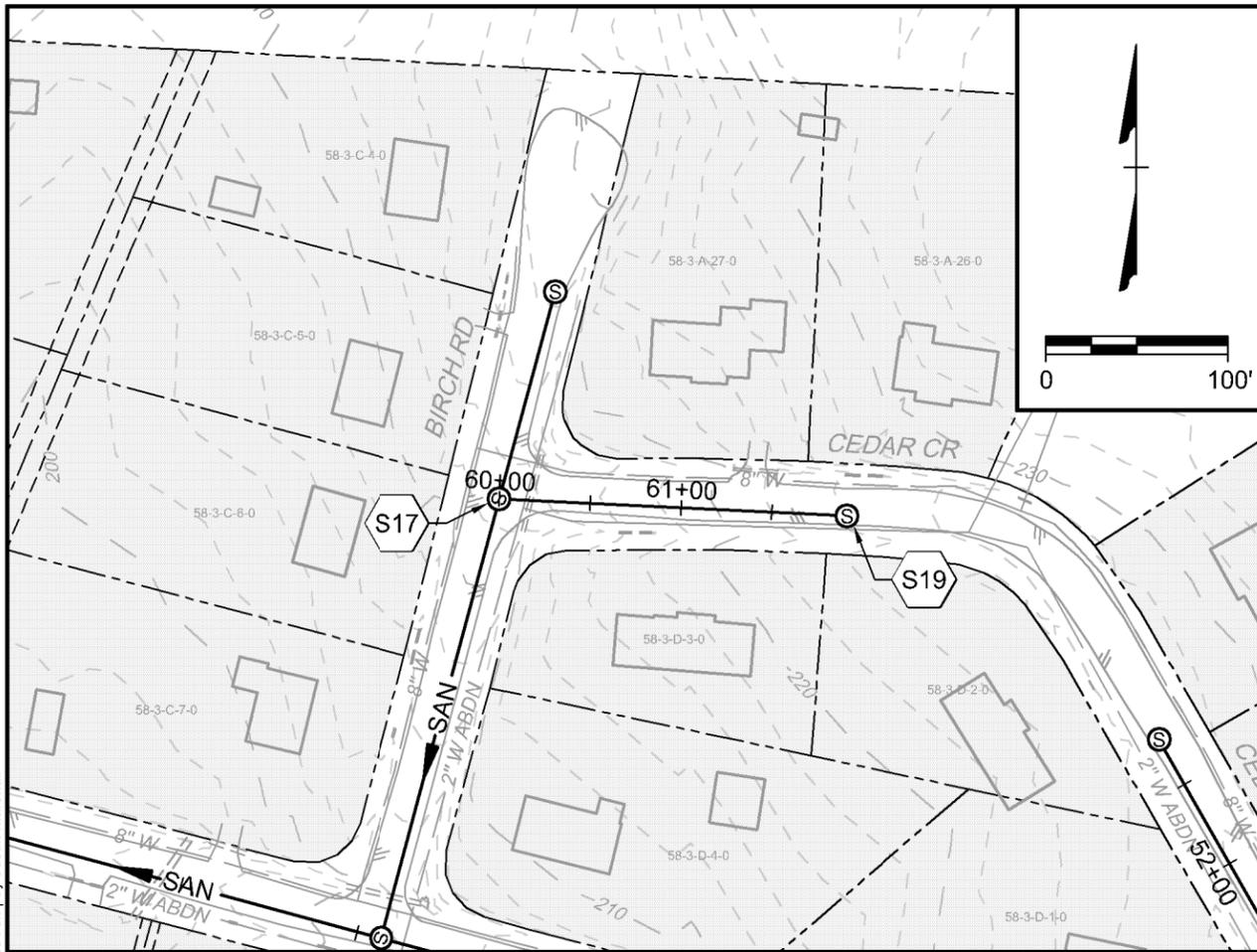
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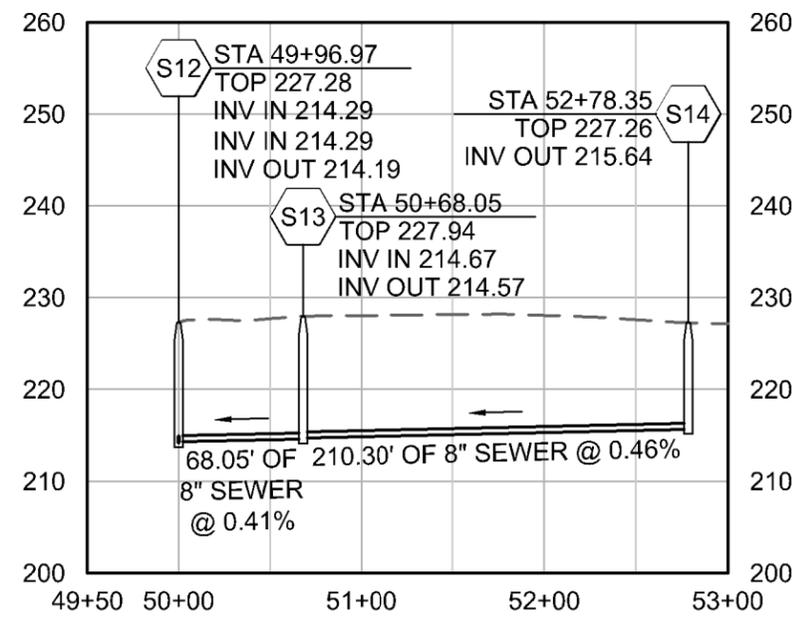
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CEDAR CIRCLE WEST



CEDAR CIRCLE EAST

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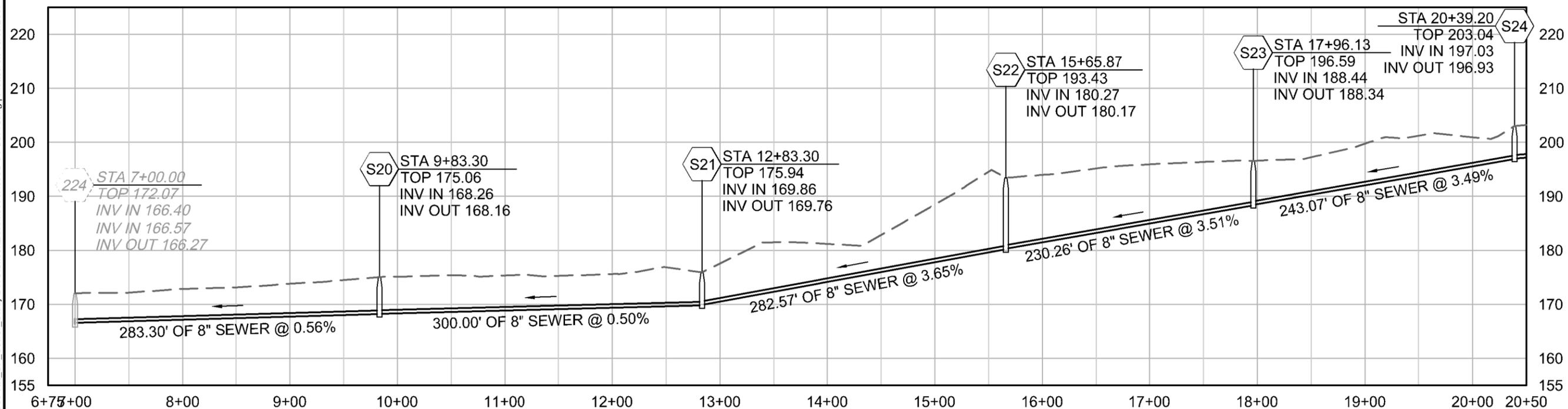
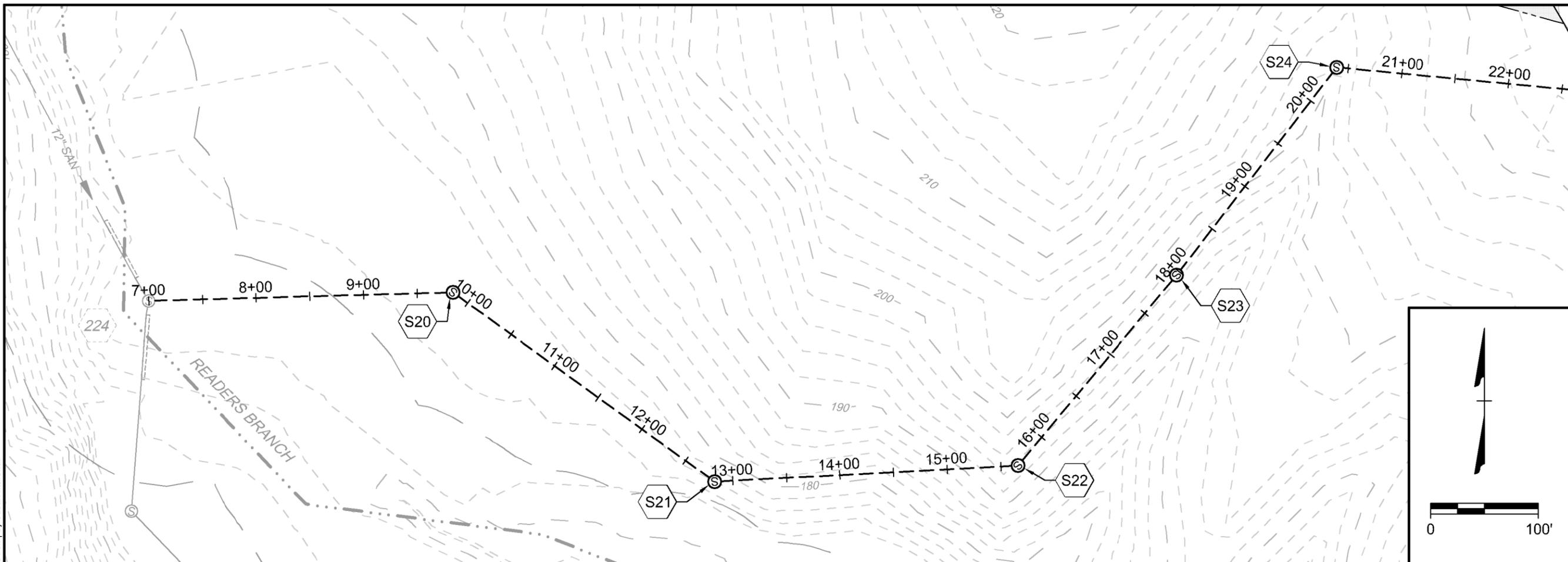
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CEDAR CIRCLE

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WHIPPOORWILL ROAD NORTH - 1

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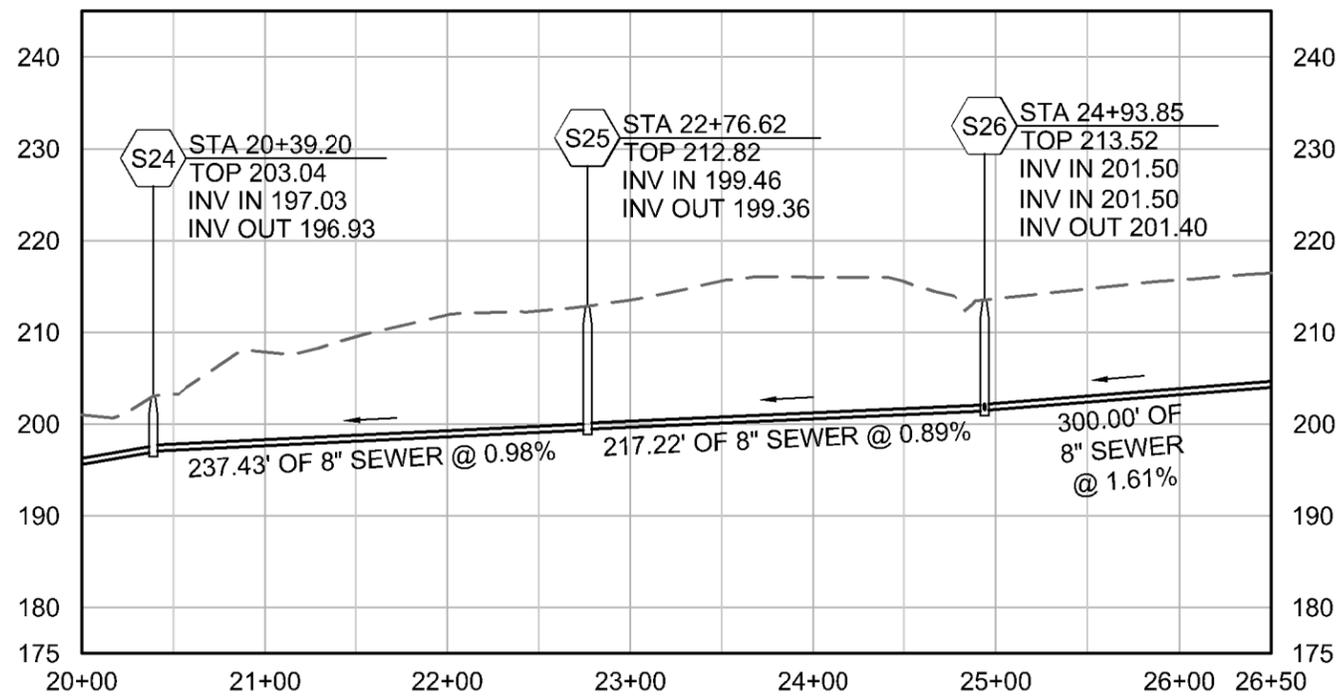
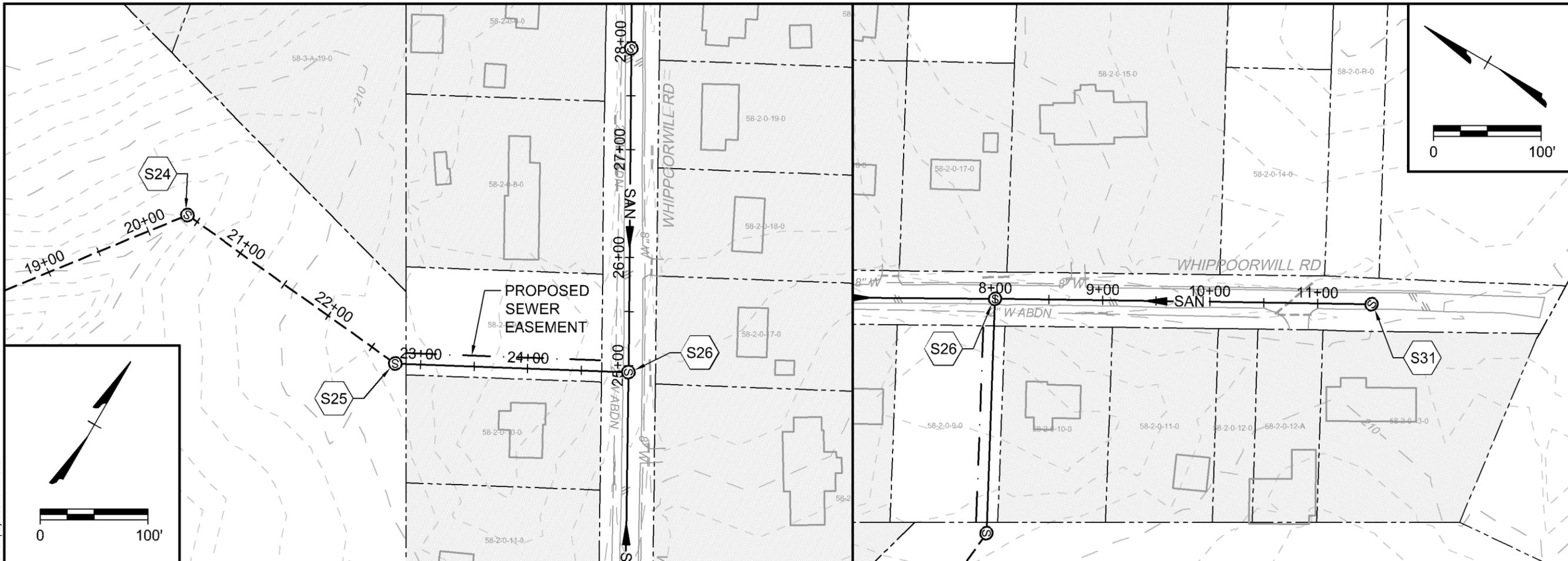
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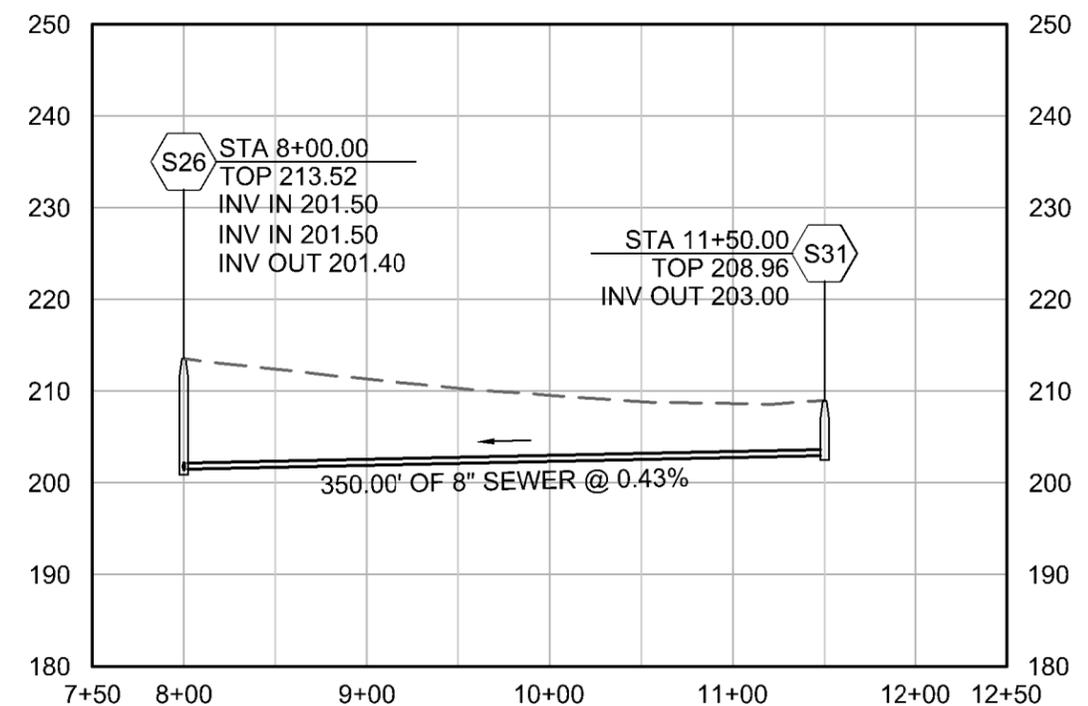
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WHIPPOORWILL ROAD NORTH - 2



WHIPPOORWILL ROAD SOUTH

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