



Stormwater Management Narrative

For

**Block 13, Lots 13-18, 20 & 21
Block 14, Lots 12 & 14
Block 15, Lots 5-12
Borough of Sea Bright
Monmouth County, NJ**

January 17, 2022
Last Revised July 22, 2022
Revised May 30, 2023

Project No. 19179A

Prepared by:



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A. INTRODUCTION

The site is known as Lots 13-18, 20, 21 & 22 in Block 13, Lots 12 & 14 in Block 14, and Lots 5-12 in Block 15, in the Borough of Sea Bright, Monmouth County, New Jersey, and consists of approximately 2.66 acres. The entire tract is located within an urban redevelopment area within the Environmentally Sensitive Barrier Island PA-52 as shown on the State Planning Area Map. Portions of the site are located at the western end of Surf Street, New Street, and Church Street, and north of Beach Street. Portions are also located on the south and north sides of South Street and south of River Street, bordered by the South Shrewsbury River along the western property line. The tract has frontage to Front Street, Church Street, South Street, River Street, and an unnamed street traversing from South Street to River Street. Currently the site consists of residential dwellings with access driveways and building appurtenances, marine buildings and paved and gravel parking areas, and abandoned commercial buildings with associated parking areas.

The proposed development of the property consists of the construction of four (4) single-family homes, twenty-five (25) townhouse units distributed in five (5) buildings, and one (1) residential condominium building with fifteen (15) residential units. Associated with the construction of the residential development is the construction of access driveways, pedestrian circulation, improvements to the municipal roadways, lighting and landscaping, and a stormwater management system. In addition, approximately one acre of the tract area is proposed to be open space. The construction of the project as proposed reduces the impervious coverage by approximately 0.85 acres.

The intent of this report is to analyze the stormwater impact of the proposed development.

This report has been modified to address the NJDEP comments. Specifically, a Phasing-Drainage Plan and Existing Conditions Phasing Plan have been added to the Appendix, and Phasing Section added to the

narrative to include a Phasing Plan Areas Summary. In addition, Water Quantity, Groundwater Recharge, Water Quality Sections have been added to the report to specifically show compliance with the N.J.A.C. 7:8.

B. PRE-DEVELOPED DRAINAGE CONDITIONS

The site currently consists of residential dwellings with access driveways and building appurtenances, marine buildings and paved and gravel parking areas, and abandoned commercial buildings with associated parking areas. Currently, approximately 2.28 acres of the tract area is covered with impervious surfaces. The stormwater runoff generated by the northern portion of the site currently flows towards the existing drainage pipe systems located in River Street, South Street, and Church Street. Currently, these drainage systems discharge directly into South Shrewsbury River through the existing bulkhead culverts. The stormwater generated by the southern portion of the site is collected and conveyed through the existing drainage pipe system in Front Street and Beach Street, discharging into an existing pump station at the terminus of Beach Street. The pump station ultimately discharges stormwater runoff into South Shrewsbury River. The South Shrewsbury River bordering the site is classified as tidal waters.

C. POST-DEVELOPED DRAINAGE CONDITIONS

It is proposed to construct four (4) single-family homes, twenty-five (25) townhouse units distributed in five (5) buildings, and a residential condominium building with fifteen (15) units. Associated with the residential development, it is proposed to construct access driveways, pedestrian circulation, improvements to the municipal streets, lighting and landscaping, and stormwater management pipe system. In addition, not part of this project, but in connection to, the construction of a pump station at the terminus of River Street is proposed. The existing drainage pipe systems in South Street, Church Street, and River Street are proposed to be intercepted and connected to the proposed drainage system. The northern drainage

system will discharge into the proposed pump station at the terminus of River Street. The proposed pump station will ultimately discharge into the South Shrewsbury River. The existing discharge culverts along the bulkhead from Church Street to River Street will be abandoned. The proposed pump station at the terminus of River Street will be designed by others.

The proposed post-development drainage patterns will remain the same as under existing pre-development conditions. The stormwater generated by the southern portion of the site will continue to be directed into the existing pump station in Beach Street prior to discharging into South Shrewsbury River. The stormwater generated by the northern portion of the site will continue to drain northwards towards to the proposed pump station at the terminus of River Street (to be designed and constructed by others) prior to discharging into the South Shrewsbury River.

The development disturbs approximately 3.63 acres and reduces the impervious areas by approximately 0.85 acres. In addition, the project proposes approximately one (1) acre of open space along the South Shrewsbury River. As such, as the development is proposing to reduce impervious areas, which includes a reduction to motor vehicle areas, the South Shrewsbury River discharge waters being tidal, and the project being located within an Urban Redevelopment Area as defined in the Stormwater Management rules, the project is exempted to meet the NJAC 7:8 requirements for stormwater runoff quality, quantity, and groundwater recharge.

D. WATER QUANTITY

Stormwater runoff quantity standards are applicable for major developments. Major developments discharging stormwater runoff in tidal flood hazard areas shall demonstrate through hydrologic and hydraulic analysis that the increase volume, change in timing, or increased rate of stormwater runoff, or any combination of the three will not result in additional flood damage below the point of discharge. In addition, no analysis is required if the stormwater discharge from the development

is directly into any ocean, bay, inlet, or the reach of any watercourse between its confluence with an ocean. Therefore, as the development discharges directly to South Shrewsbury River, that is the reach to the Atlantic Ocean, the project is exempt from the water quantity and the hydrologic and hydraulic analysis.

E. GROUNDWATER RECHARGE

The proposed development is located within Urban Redevelopment Area. As outlined on the N.J.A.C. 7:8-5.4.(b).2 groundwater recharge requirement does not apply to projects within the urban redevelopment area.

Although not required, the installation of porous paves for all single-family and townhouses driveways, for all walkways and sidewalks within the development, and on approximately 1,200 sf parking spaces area will promote groundwater recharge from the development.

F. WATER QUALITY

Stormwater runoff quality standards are applicable when the major development results in an increase of one-quarter acre or more motor vehicle surfaces. The project as proposed decreases the motor vehicle surfaces on all phases of the project, and collectively as well. As such, N.J.A.C 7:8 water quality standards are not required.

Although not required, water quality is enhanced with the construction of porous pavers for all single-family and townhouses driveways, for all walkways and sidewalks within the development, and on approximately 1,200 sf parking spaces area.

G. STORM SEWER DESIGN

The storm sewer has been designed in accordance with the Borough and NJDEP requirements. Hydraflow Storm Sewers Extension v2021 Software by Autodesk was utilized in the design. The proposed storm sewer was designed using the Rational Method with a minimum time of concentration of 10 minutes and the New Jersey

Intensity-Duration-Frequency Table. A composite of “C” Runoff Coefficient of 0.9 for impervious areas and 0.20 for grassed and landscaped areas was utilized for the drainage areas to the stormwater conveyance system. Manning’s Formula with a Coefficient of 0.013 for reinforced concrete pipe was utilized. The storm sewer was designed to convey the 25-year storm frequency.

The drainage pipe system proposed as part of the development includes the off-site areas draining into the existing pipes being intercepted. Conservatively, the stormwater runoff generated by the offsite areas were calculated assuming 95% of impervious areas. The southern portion of the on-site pipe system is proposed to connect to the existing pipe system in Front Street, which is connected to the existing pump station in Beach Street prior discharging to the South Shrewsbury River. The northern portion of the pipe system is proposed to connect to the proposed pump station in River Street (to be designed by others), prior to discharge into the South Shrewsbury River.

No attempt has been made to verify or calculate the capacity of the existing or proposed pump stations. Please note that the proposed pump station and discharge piping at the terminus of River Street is not part of this project and will be designed and constructed by others.

The storm sewer design calculations can be found in the Appendix.

H. PHASING

The project is proposed to be constructed in four (4) phases. The description of each phase of construction is included on the Phasing-Drainage Plan found in the Appendices.

The Phasing Plan Areas Summary below shows the limit of disturbance, existing and proposed impervious surfaces, existing and proposed motor vehicle surfaces for each of the four phases. The net impervious, addition or reduction, is also included.

PHASING PLAN AREAS SUMMARY					
	DISTURBANCE	AREA	EXISTING	PROPOSED	NET
PHASE I	1.100 AC	TOTAL IMPERVIOUS	0.344 AC	0.562 AC	0.218 AC
		MOTOR VEHICLE	0.261 AC	0.071 AC	- 0.190 AC
PHASE II	1.404 AC	TOTAL IMPERVIOUS	1.119 AC	1.037 AC	- 0.082 AC
		MOTOR VEHICLE	0.826 AC	0.571 AC	- 0.255 AC
PHASE III	0.376 AC	TOTAL IMPERVIOUS	0.282 AC	0.309 AC	0.027 AC
		MOTOR VEHICLE	0.129 AC	0.003 AC	- 0.126 AC
PHASE IV	0.751 AC	TOTAL IMPERVIOUS	0.427 AC	0.690 AC	0.263 AC
		MOTOR VEHICLE	0.127 AC	0.280 AC	- 0.153 AC

NOTE:

THE PHASING AREAS INCLUDE OF THE PROJECT SITE AREA AND ADJACENT ROADWAYS IMPROVEMENTS.

I. CONCLUSION

The proposed development will lead to a decrease in stormwater runoff volume due to the reduction of impervious surfaces by approximately 0.85 acre from the redevelopment of the site. In addition, although not required, the water quality will be enhanced by the installation of porous pavers on driveways, sidewalks, walkways, and on approximately 1,200 sf parking spaces area. In addition, and also not required, groundwater recharge is promoted with the use of the porous pavers as described above. Therefore, no adverse impact to surrounding properties is expected due to the construction of the project as proposed.

APPENDIX A
DRAINAGE PIPE CALCULATIONS

WJH

Line No.	Inlet ID	DnStm Ln No	Drng Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	Inlet Time (min)	Incr Q (cfs)	Known Q (cfs)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Size (in)	Line Type	n-val Pipe	Line Length (ft)	Line Slope (%)	Invert Dn (ft)	Invert Up (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)
1	DMH-S20	Outfall	0.00	0.00	0.00	12.59	10.0	0.00	0.00	26.80	73.60	2.79	42	Cir	0.013	9.34	0.54	-6.50	-6.45	2.14	2.78
2	DMH-S19	1	0.00	0.90	0.00	5.35	10.0	0.00	0.00	11.48	67.54	1.19	42	Cir	0.013	73.23	0.45	-6.45	-6.12	2.78	4.18
3	E2	2	0.12	0.90	0.11	0.24	10.0	0.62	0.00	1.34	5.40	2.92	15	Cir	0.013	77.31	0.70	0.60	1.14	4.18	4.30
4	E1	3	0.15	0.90	0.14	0.14	10.0	0.77	0.00	0.77	4.57	2.36	15	Cir	0.013	127.90	0.50	1.14	1.78	4.30	4.89
5	S18	2	0.00	0.00	0.00	5.11	10.0	0.00	0.00	11.01	44.50	1.56	36	Cir	0.013	65.15	0.45	-5.62	-5.33	4.18	3.60
6	DMH-16	5	0.00	0.00	0.00	5.11	10.0	0.00	0.00	11.03	43.74	1.56	36	Cir	0.013	23.25	0.43	-5.33	-5.23	3.60	3.75
7	S17	6	0.11	0.83	0.09	3.56	10.0	0.52	0.00	7.70	44.27	1.09	36	Cir	0.013	11.35	0.44	-5.23	-5.18	3.75	3.80
8	S15	7	0.24	0.66	0.16	3.47	10.0	0.91	0.00	7.64	42.18	1.08	36	Cir	0.013	160.01	0.40	-5.18	-4.54	3.80	4.00
9	DMH-S14	8	0.00	0.68	0.00	3.31	10.0	0.00	0.00	7.32	42.47	1.04	36	Cir	0.013	32.06	0.41	-4.54	-4.41	4.00	3.85
10	EX-DMH 2	9	0.00	0.00	0.00	3.31	10.0	0.00	0.00	7.33	27.97	1.49	30	Cir	0.013	12.90	0.47	-3.90	-3.84	3.85	3.90
11	EX. MH 1	10	0.00	0.00	0.00	3.22	10.0	0.00	0.00	7.13	8.49	4.03	18	Cir	0.013	42.88	0.65	-2.73	-2.45	3.90	4.00
12	DMH-C3	11	3.46	0.87	3.01	3.17	10.0	17.20	0.00	7.04	10.50	3.98	18	Cir	0.013	40.98	1.00	-1.06	-0.65	4.00	3.58
13	C1	12	0.03	0.90	0.03	0.06	10.0	0.15	0.00	0.13	6.13	0.11	15	Cir	0.013	15.55	0.90	-0.40	-0.26	3.58	3.85
14	Y-4	13	0.05	0.57	0.03	0.03	10.0	0.16	0.00	0.08	3.50	0.10	12	Cir	0.013	63.17	0.97	-0.01	0.60	3.85	3.25
15	Y-3	14	0.01	0.20	0.00	0.00	10.0	0.01	0.00	0.01	3.57	0.01	12	Cir	0.013	39.81	1.00	0.60	1.00	3.25	3.00
16	EX. INLET A	11	0.03	0.90	0.03	0.03	10.0	0.15	0.00	0.15	2.65	0.20	12	Cir	0.012	17.00	0.47	0.54	0.62	4.00	3.70
17	EX. INLET B	11	0.02	0.90	0.02	0.02	10.0	0.10	0.00	0.10	2.51	0.13	12	Cir	0.012	18.87	0.42	0.39	0.47	4.00	4.20
18	EX-INLET	6	0.07	0.90	0.06	1.55	10.0	0.36	0.00	6.47	31.34	1.32	30	Cir	0.013	77.06	0.58	-3.70	-3.25	3.75	2.65
19	B3A	18	0.63	0.87	0.55	1.49	10.0	3.13	0.00	6.25	21.28	1.99	24	Cir	0.013	39.52	0.89	-2.75	-2.40	2.65	2.75
20	B3	19	1.08	0.86	0.93	0.94	10.0	5.31	0.00	3.96	7.41	2.24	18	Cir	0.013	18.09	0.50	-1.90	-1.81	2.75	2.75
21	Y-2	20	0.02	0.46	0.01	0.01	10.0	0.05	0.00	0.05	3.22	0.07	12	Cir	0.013	42.88	0.82	0.15	0.50	2.75	3.00
22	C2	12	0.13	0.79	0.10	0.10	10.0	0.59	0.00	0.59	5.67	0.48	15	Cir	0.013	16.86	0.77	-0.03	0.10	3.58	3.50
23	DMH-S22	1	3.01	0.86	2.59	7.24	10.0	14.79	0.00	41.20	79.70	4.28	42	Cir	0.013	11.16	0.63	-4.00	-3.93	2.78	2.70

Project File: Rev. Storm Conveyance.stm

Number of lines: 30

Date: 7/25/2022

NOTES: ** Critical depth



Line No.	Inlet ID	DnStm Ln No	Drng Area (ac)	Runoff Coeff (C)	Incr CxA	Total CxA	Inlet Time (min)	Incr Q (cfs)	Known Q (cfs)	Flow Rate (cfs)	Capac Full (cfs)	Vel Ave (ft/s)	Line Size (in)	Line Type	n-val Pipe	Line Length (ft)	Line Slope (%)	Invert Dn (ft)	Invert Up (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)
24	S21	23	5.41	0.86	4.65	4.65	10.0	26.59	0.00	26.59	46.23	3.76	36	Cir	0.013	27.06	0.48	-3.43	-3.30	2.70	2.25
25	S30	10	0.13	0.74	0.10	0.10	10.0	0.55	0.00	0.55	4.70	0.45	15	Cir	0.013	16.96	0.53	-2.84	-2.75	3.90	3.70
26	S4B	Outfall	2.31	0.86	1.99	2.65	10.0	11.35	0.00	12.86	18.74	4.09	24	Cir	0.013	7.28	0.69	-2.00	-1.95	1.66	1.73
27	S8	26	0.13	0.85	0.11	0.66	10.0	0.63	0.00	3.27	7.71	2.66	15	Cir	0.013	105.34	1.42	-1.20	0.30	1.73	4.10
28	S7	27	0.16	0.82	0.13	0.13	10.0	0.75	0.00	0.75	4.59	0.82	15	Cir	0.013	75.33	0.50	0.82	1.20	4.10	4.40
29	S9	27	0.38	0.87	0.33	0.42	10.0	1.89	0.00	2.12	4.66	1.73	15	Cir	0.013	84.34	0.52	0.30	0.74	4.10	3.80
30	S12	29	0.16	0.54	0.09	0.09	10.0	0.49	0.00	0.49	4.55	0.54	15	Cir	0.013	112.76	0.50	0.74	1.30	3.80	4.10

Project File: Rev. Storm Conveyance.stm

Number of lines: 30

Date: 7/25/2022

NOTES: ** Critical depth

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
1	42	26.80	-6.50	1.03	3.50	9.62	2.79	0.12	1.15	0.071	9.34	-6.45	1.04	3.50	9.62	2.79	0.12	1.16	0.071	0.071	0.007	0.80	0.10
2	42	11.48	-6.45	1.13	3.50	9.62	1.19	0.02	1.16	0.013	73.23	-6.12	1.14	3.50	9.62	1.19	0.02	1.16	0.013	0.013	0.010	0.70	0.02
3	15	1.34	0.60	1.16	0.56	0.41	2.54	0.17	1.33	0.000	77.31	1.14	1.60 j	0.46**	0.41	3.30	0.17	1.77	0.000	0.000	n/a	0.50	n/a
4	15	0.77	1.14	1.60	0.46	0.27	1.89	0.06	1.65	0.174	127.90	1.78	2.12	0.34**	0.27	2.82	0.12	2.25	0.524	0.349	n/a	0.50	0.06
5	36	11.01	-5.62	1.16	3.00	7.07	1.56	0.04	1.20	0.027	65.15	-5.33	1.18	3.00	7.07	1.56	0.04	1.21	0.027	0.027	0.018	1.00	0.04
6	36	11.03	-5.33	1.21	3.00	7.07	1.56	0.04	1.25	0.027	23.25	-5.23	1.22	3.00	7.07	1.56	0.04	1.26	0.027	0.027	0.006	0.00	0.00
7	36	7.70	-5.23	1.22	3.00	7.07	1.09	0.02	1.24	0.013	11.35	-5.18	1.22	3.00	7.07	1.09	0.02	1.24	0.013	0.013	0.002	0.50	0.01
8	36	7.64	-5.18	1.23	3.00	7.07	1.08	0.02	1.25	0.013	160.01	-4.54	1.25	3.00	7.07	1.08	0.02	1.27	0.013	0.013	0.021	0.60	0.01
9	36	7.32	-4.54	1.26	3.00	7.07	1.04	0.02	1.28	0.012	32.06	-4.41	1.27	3.00	7.07	1.04	0.02	1.28	0.012	0.012	0.004	0.80	0.01
10	30	7.33	-3.90	1.28	2.50	4.91	1.49	0.03	1.31	0.032	12.90	-3.84	1.28	2.50	4.91	1.49	0.03	1.32	0.032	0.032	0.004	0.70	0.02
11	18	7.13	-2.73	1.31	1.50	1.77	4.03	0.25	1.56	0.461	42.88	-2.45	1.51	1.50	1.77	4.03	0.25	1.76	0.461	0.461	0.198	1.00	0.25
12	18	7.04	-1.06	1.76	1.50	1.77	3.98	0.25	2.01	0.449	40.98	-0.65	1.94	1.50	1.77	3.98	0.25	2.19	0.449	0.449	0.184	0.70	0.17
13	15	0.13	-0.40	2.12	1.25	1.23	0.11	0.00	2.12	0.000	15.55	-0.26	2.12	1.25	1.23	0.11	0.00	2.12	0.000	0.000	0.000	0.60	0.00
14	12	0.08	-0.01	2.12	1.00	0.79	0.10	0.00	2.12	0.000	63.17	0.60	2.12	1.00	0.79	0.10	0.00	2.12	0.000	0.000	0.000	0.65	0.00
15	12	0.01	0.60	2.12	1.00	0.79	0.01	0.00	2.12	0.000	39.81	1.00	2.12	1.00	0.79	0.01	0.00	2.12	0.000	0.000	0.000	0.50	0.00
16	12	0.15	0.54	1.76	1.00	0.79	0.20	0.00	1.76	0.002	17.00	0.62	1.76	1.00	0.79	0.20	0.00	1.76	0.002	0.002	0.000	0.50	0.00
17	12	0.10	0.39	1.76	1.00	0.79	0.13	0.00	1.76	0.001	18.87	0.47	1.76	1.00	0.79	0.13	0.00	1.76	0.001	0.001	0.000	0.50	0.00
18	30	6.47	-3.70	1.22	2.50	4.91	1.32	0.03	1.25	0.025	77.06	-3.25	1.24	2.50	4.91	1.32	0.03	1.27	0.025	0.025	0.019	0.50	0.01
19	24	6.25	-2.75	1.25	2.00	3.14	1.99	0.06	1.31	0.076	39.52	-2.40	1.28	2.00	3.14	1.99	0.06	1.34	0.076	0.076	0.030	0.80	0.05
20	18	3.96	-1.90	1.33	1.50	1.77	2.24	0.08	1.41	0.142	18.09	-1.81	1.36	1.50	1.77	2.24	0.08	1.44	0.142	0.142	0.026	0.60	0.05
21	12	0.05	0.15	1.40	1.00	0.79	0.07	0.00	1.40	0.000	42.88	0.50	1.41	0.91	0.75	0.07	0.00	1.41	0.000	0.000	0.000	0.50	0.00
22	15	0.59	-0.03	2.12	1.25	1.23	0.48	0.00	2.12	0.008	16.86	0.10	2.12	1.25	1.23	0.48	0.00	2.12	0.008	0.008	0.001	0.50	0.00

Project File: Rev. Storm Conveyance.stm

Number of lines: 30

Run Date: 7/25/2022

Notes: ; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								Check		JL coeff (K)	Minor loss (ft)
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)		
23	42	41.20	-4.00	1.13	3.50	9.62	4.28	0.29	1.42	0.168	11.16	-3.93	1.15	3.50	9.62	4.28	0.29	1.44	0.168	0.168	0.019	0.80	0.23
24	36	26.59	-3.43	1.38	3.00	7.07	3.76	0.22	1.60	0.159	27.06	-3.30	1.42	3.00	7.07	3.76	0.22	1.64	0.159	0.159	0.043	0.50	0.11
25	15	0.55	-2.84	1.31	1.25	1.23	0.45	0.00	1.31	0.007	16.96	-2.75	1.31	1.25	1.23	0.45	0.00	1.31	0.007	0.007	0.001	0.50	0.00
26	24	12.86	-2.00	1.44	2.00	3.14	4.10	0.26	1.70	0.324	7.28	-1.95	1.46	2.00	3.14	4.09	0.26	1.72	0.323	0.324	0.024	0.50	0.13
27	15	3.27	-1.20	1.59	1.25	1.23	2.66	0.11	1.70	0.256	105.34	0.30	1.86	1.25	1.23	2.66	0.11	1.97	0.256	0.256	0.270	0.60	0.07
28	15	0.75	0.82	1.93	1.11	1.15	0.65	0.01	1.94	0.012	75.33	1.20	1.94	0.74	0.75	1.00	0.02	1.95	0.032	0.022	0.016	0.50	0.01
29	15	2.12	0.30	1.93	1.25	1.23	1.73	0.05	1.98	0.108	84.34	0.74	1.99	1.25	1.23	1.73	0.05	2.04	0.106	0.107	0.090	0.50	0.02
30	15	0.49	0.74	2.01	1.25	1.23	0.40	0.00	2.02	0.006	112.76	1.30	2.02	0.72	0.73	0.67	0.01	2.03	0.015	0.010	0.012	0.50	0.00

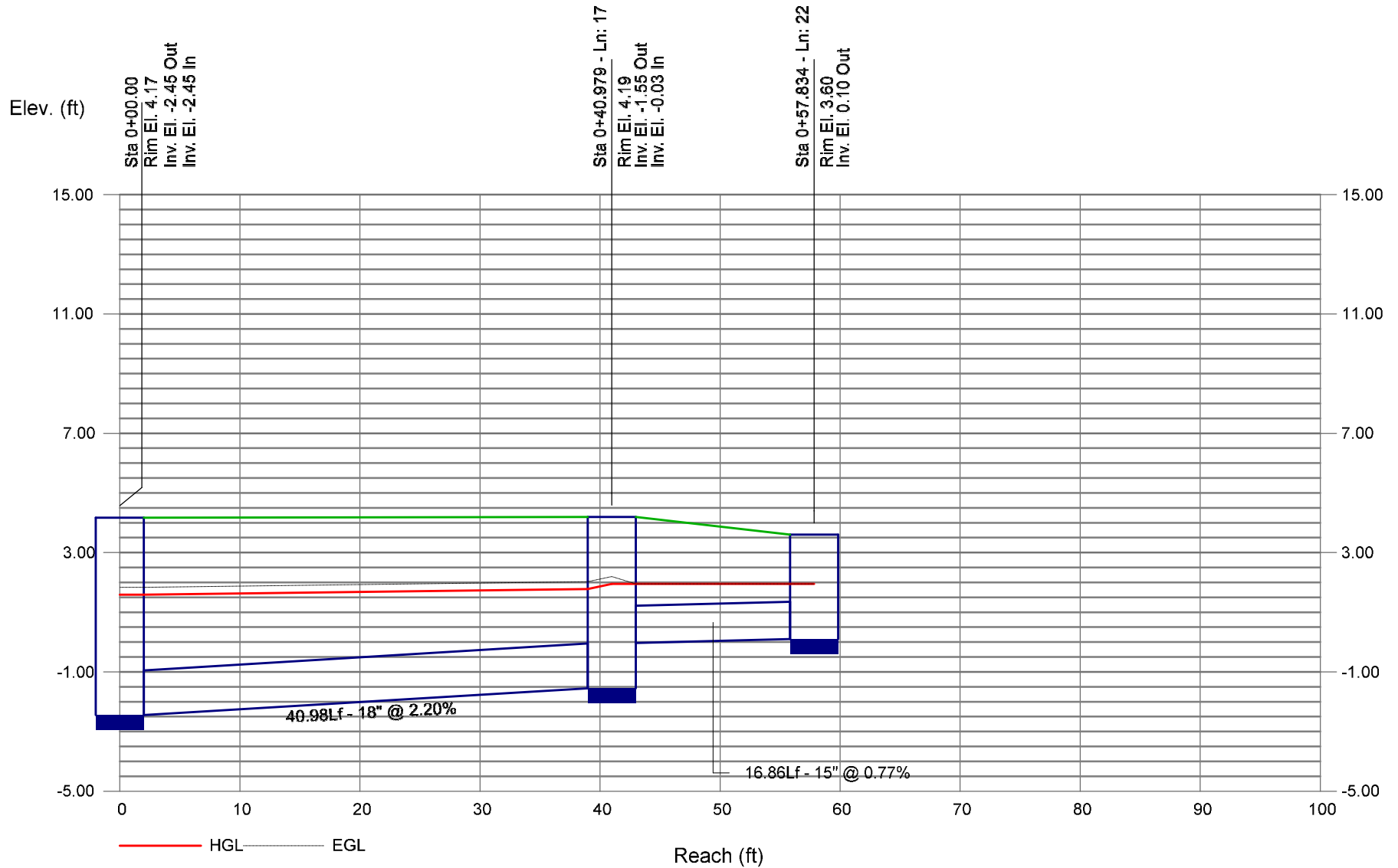
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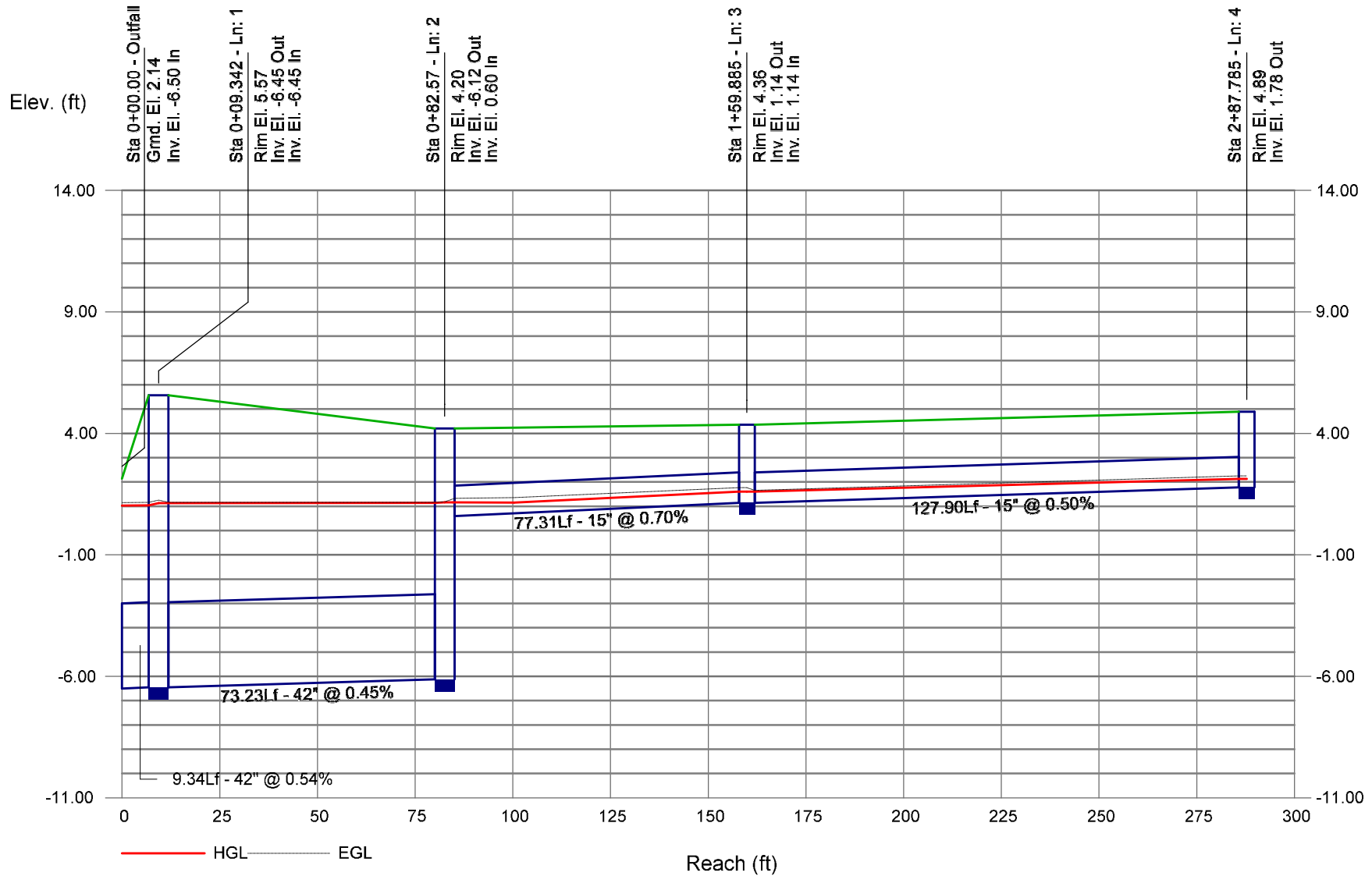
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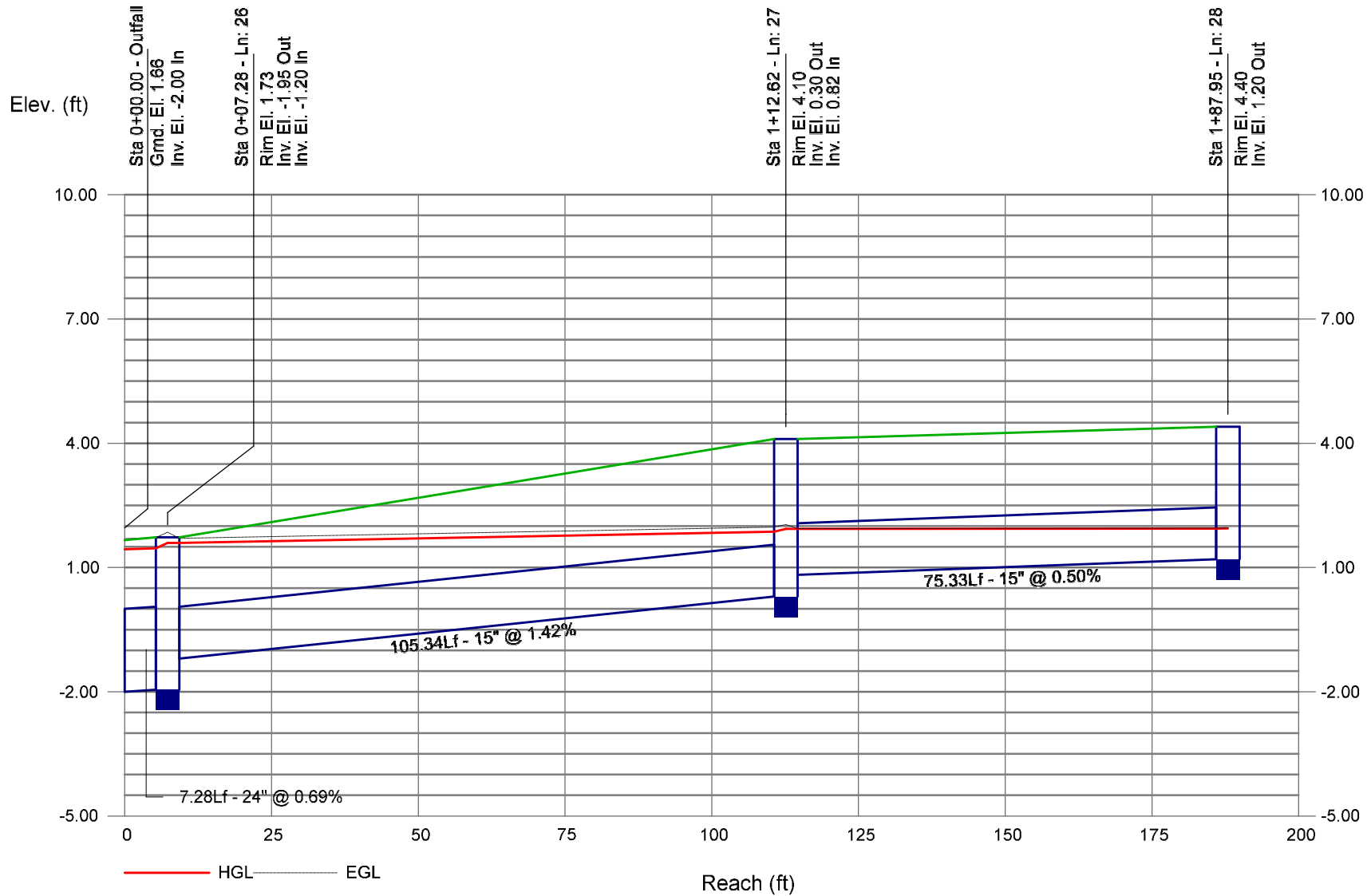
Run Date: 7/25/2022

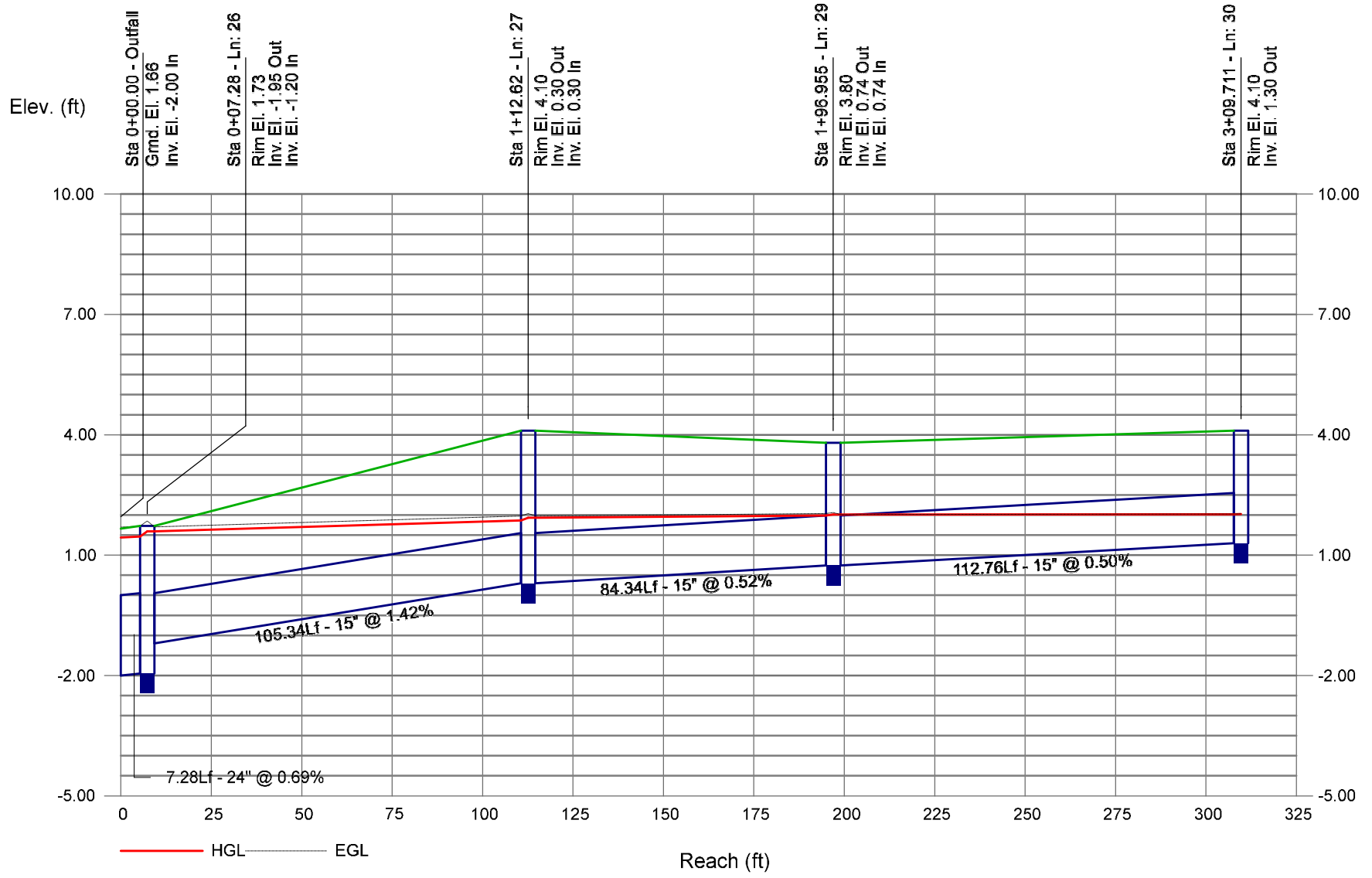
Notes: ; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

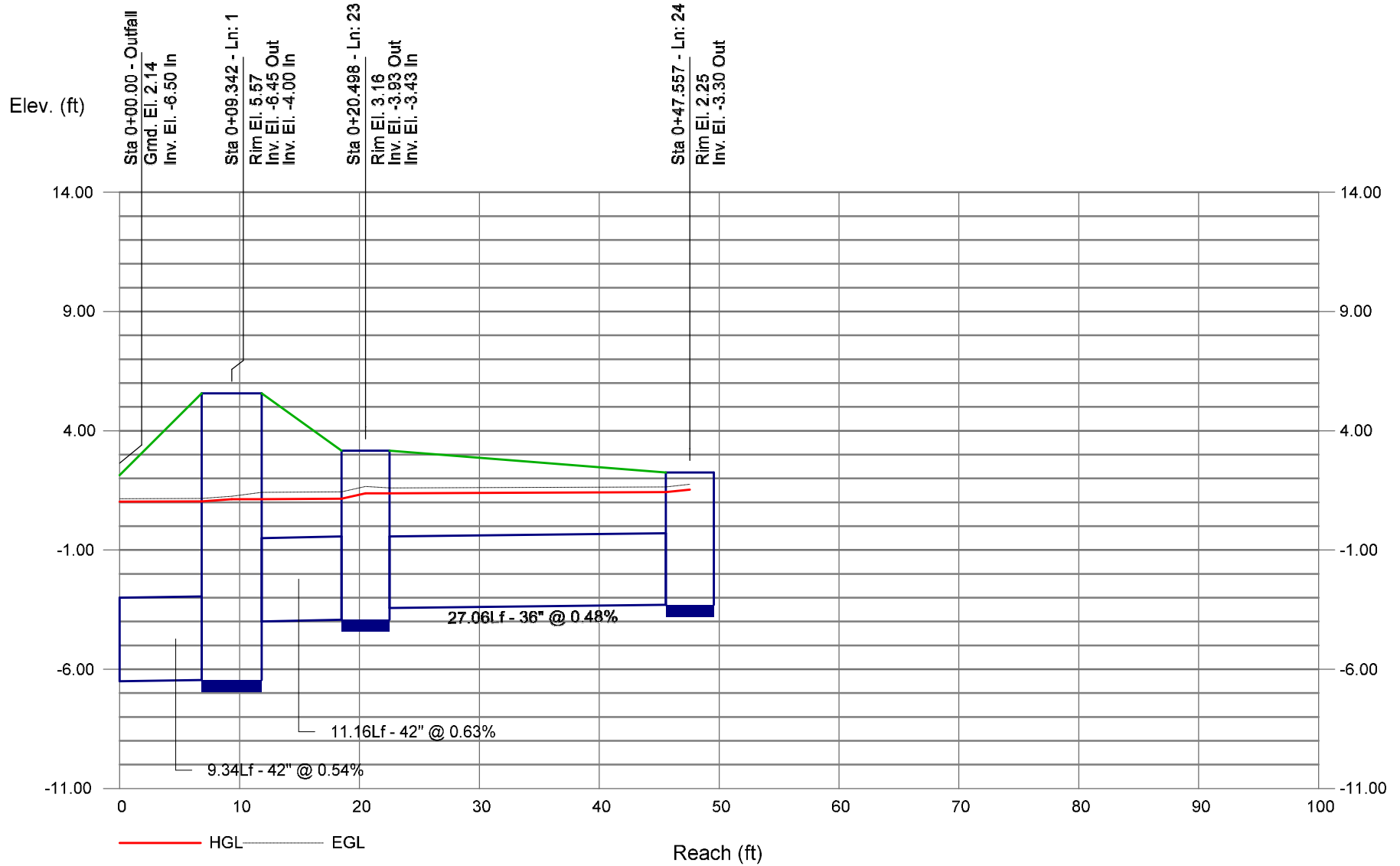
APPENDIX B
DRAINAGE PIPE PROFILES

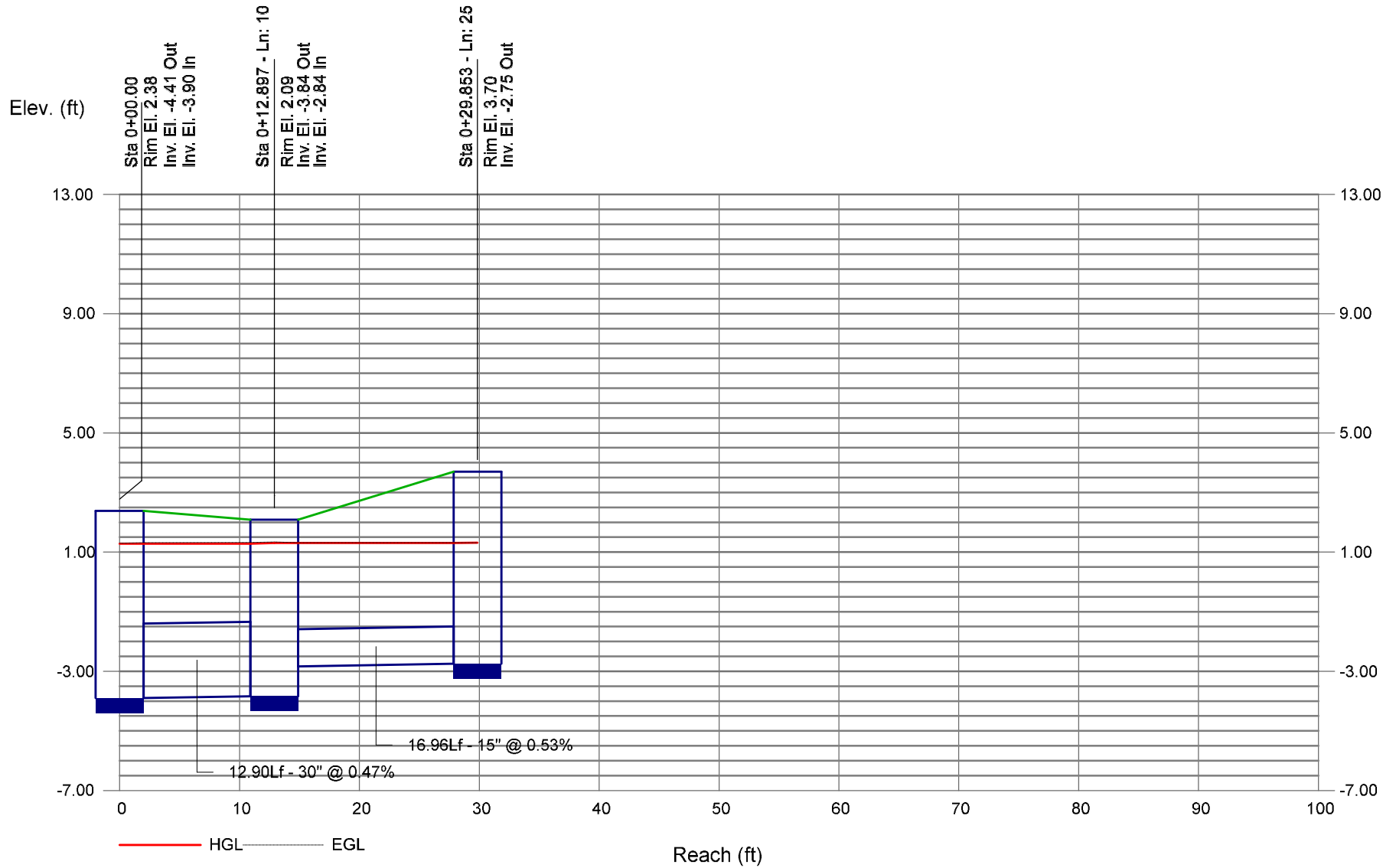


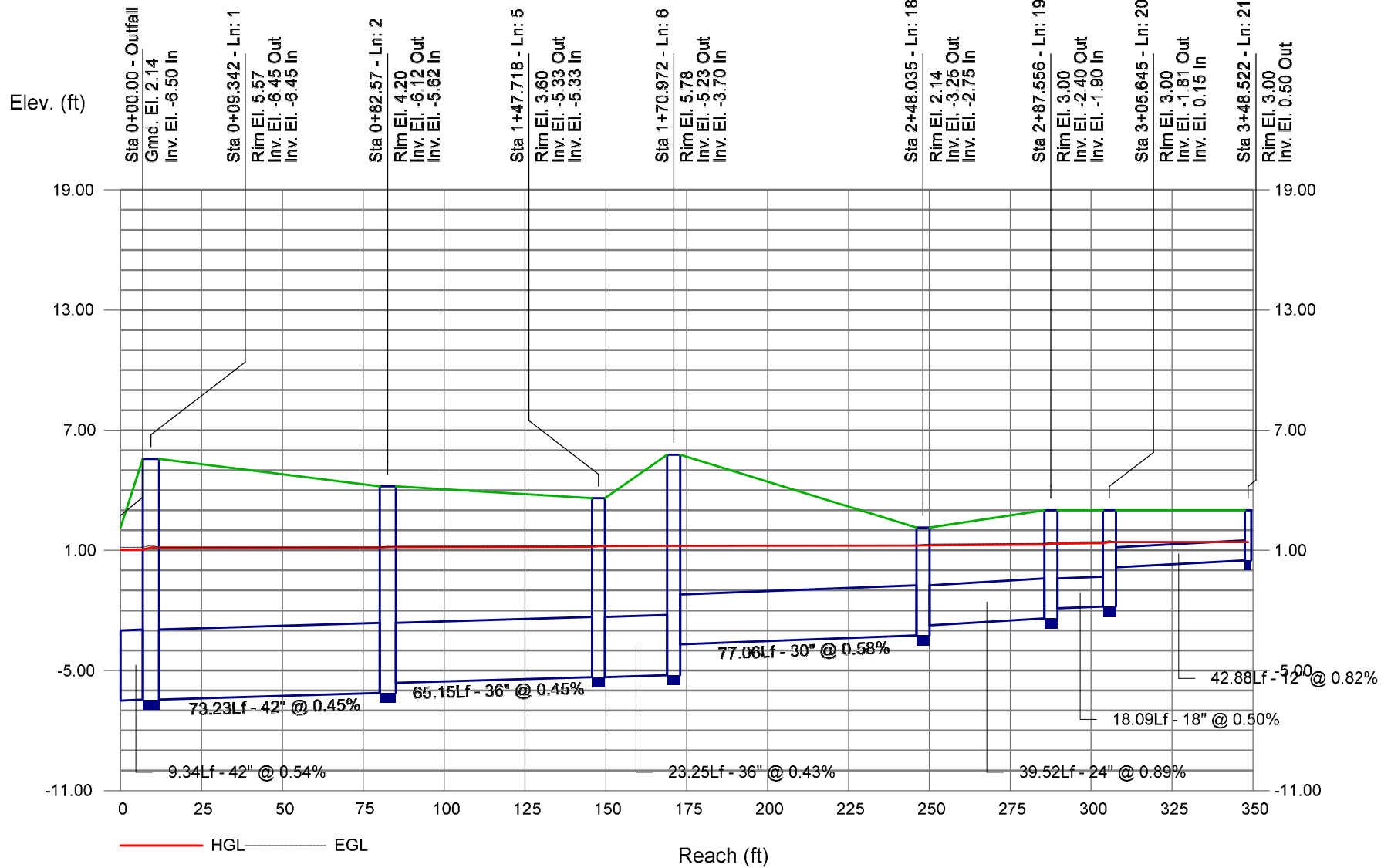


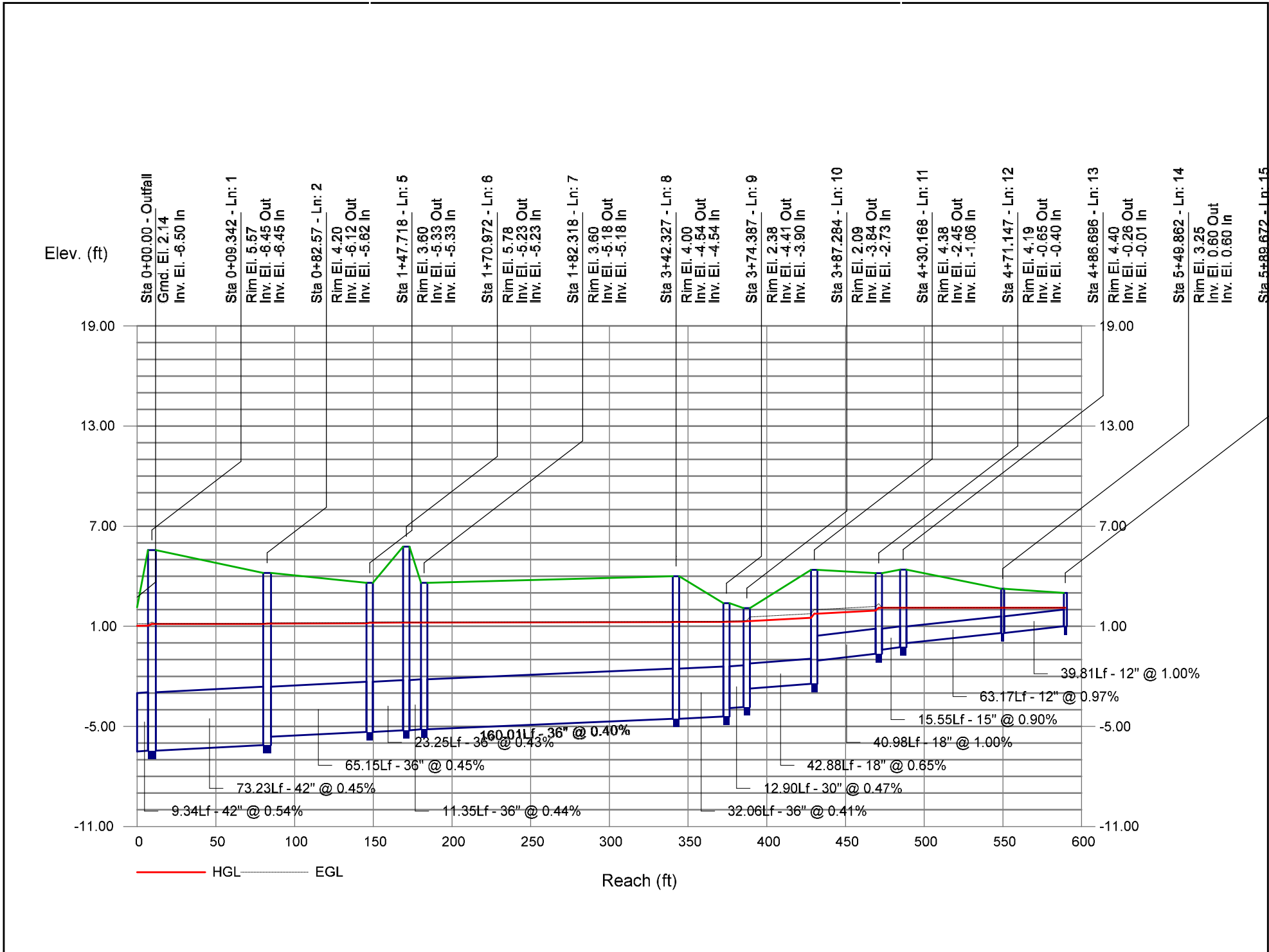




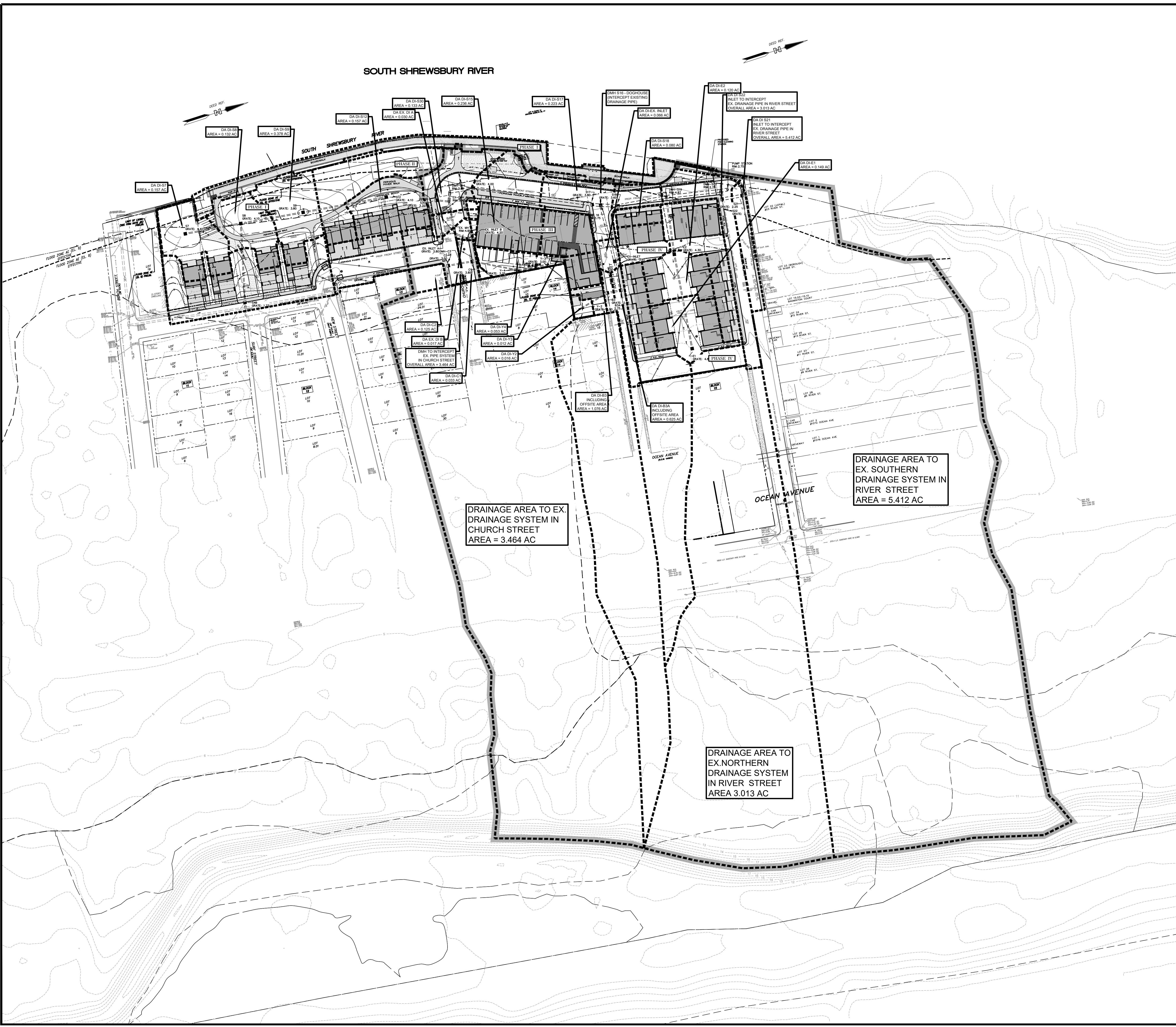








APPENDIX C
OVERALL DRAINAGE INLET MAP



NO.	DATE	DESCRIPTION	DRAWN BY

PRELIMINARY MAJOR SITE PLAN
 BLOCK 13 LOTS 13-18, 20 & 21
 BLOCK 14 LOTS 12, 14
 BLOCK 15 LOTS 5-12
 BOROUGH OF SEA BRIGHT MONMOUTH COUNTY NEW JERSEY

WH ENGINEERING
 CERT. OF AUTH. No. 24GA2B117300
 257 MONMOUTH ROAD,
 BLDG. A, STE. 7,
 OAKHURST, NJ 07755
 PHONE: 732-223-1313
 WWW.WHENGINEERING.COM

OVERALL DRAINAGE INLET MAP
WALTER JOSEPH HOPKIN
 N.J. PROFESSIONAL ENGINEER, LIC. No. 40673

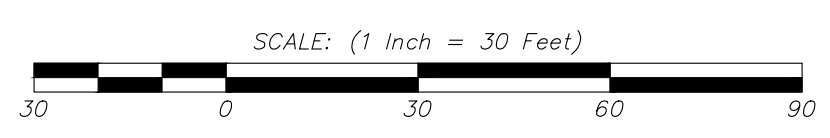
Walter Joseph Hopkin

SCALE	DRAWN BY	DATE	JOB No.	SHEET No.
1" = 20'	J.L.	7/22/22	19179A	1 OF 2

APPENDIX D
DRAINAGE INLET MAP



SEE OVERALL DRAINAGE INLET MAP FOR OFFSITE AREAS

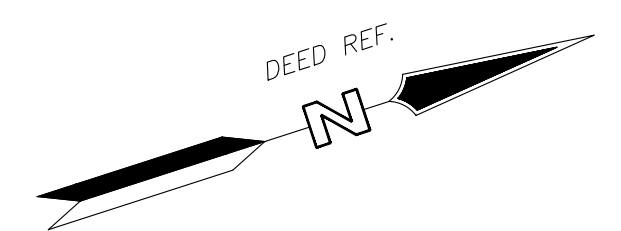


1	7/22/22	REVISED PURSUANT TO BOROUGH COMMENTS	KMB
NO.	DATE	DESCRIPTION	DRAWN BY
PRELIMINARY MAJOR SITE PLAN BLOCK 13 LOTS 13-18, 20 & 21 BLOCK 14 LOTS 13, 14 BLOCK 15 LOTS 5-12 BOROUGH OF SEA BRIGHT MONMOUTH COUNTY NEW JERSEY			
		CERT. OF AUTH. NO. 24GA28117300 257 MONMOUTH ROAD, BLDG. A, STE. 7, OAKHURST, NJ 07755 PHONE: 732-223-1313 WWW.WJHENGINEERING.COM	
DRAINAGE INLET MAP WALTER JOSEPH HOPKIN N.J. PROFESSIONAL ENGINEER, LIC. No. 40673			
SCALE:	DRAWN BY:	DATE:	JOB No.:
1" = 20'	J.J.L.	1/17/22	19179A
			SHEET No.:
			2 OF 2

APPENDIX E

EXISTING CONDITION PHASIN PLAN & PHASING-DRAINAGE PLAN

SOUTH SHREWSBURY RIVER



PHASE II AREA
 TOTAL DISTURBANCE = 61,170 SF (1.404 AC)
 TOTAL IMPERVIOUS = 48,739 SF (1.119 AC)
 MOTOR VEHICLE SURFACES = 35,962 SF (0.826 AC)

PHASE III AREA
 TOTAL DISTURBANCE = 16,386 SF (0.376 AC)
 TOTAL IMPERVIOUS = 12,299 SF (0.282 AC)
 MOTOR VEHICLE SURFACES = 5,624 SF (0.129 AC)

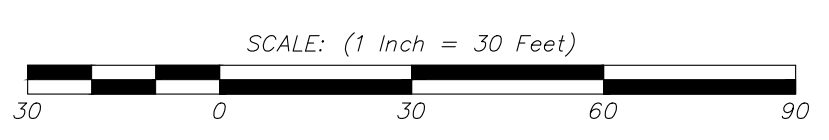
PHASE IV AREA
 TOTAL DISTURBANCE = 32,720 SF (0.751 AC)
 TOTAL IMPERVIOUS = 18,615 SF (0.427 AC)
 MOTOR VEHICLE SURFACES = 5,515 SF (0.127 AC)

PHASE I AREA
 TOTAL DISTURBANCE = 47,934 SF (1.100 AC)
 TOTAL IMPERVIOUS = 14,983 SF (0.344 AC)
 MOTOR VEHICLE SURFACES = 11,354 SF (0.261 AC)



LEGEND

- GAS VALVE
- WATER VALVE
- WATER WELL
- UTILITY MANHOLE
- DRAINAGE MANHOLE
- ELECTRICAL MANHOLE
- SANITARY MANHOLE
- TELEPHONE MANHOLE
- TRAFFIC SIGN
- TRAFFIC SIGN (2 POST)
- STREET SIGN
- LIGHT POST
- GROUND LIGHT
- UTILITY POLE
- FIRE HYDRANT
- DRAINAGE INLET (TYPE "A")
- DRAINAGE INLET (TYPE "B")
- DRAINAGE INLET (TYPE "Y")
- DRAINAGE LINE
- ELECTRIC LINE
- GAS LINE
- SANITARY SEWER LINE
- TELEPHONE LINE
- WATER LINE
- OVERHEAD WIRES
- MONITORING WELL
- IRON/ALUMINUM PIPE FOUND
- IRON BAR FOUND
- CONCRETE MONUMENT FOUND
- SURVEY
- FILE MAP
- GAS METER
- D.C. DEPRESSED CURB
- FLUSH CURB



NO.	DATE	DESCRIPTION	DRAWN BY

PRELIMINARY MAJOR SITE PLAN
 BLOCK 13 LOTS 12,13,14,15,16,17,18,20,21,22
 BLOCK 14 LOTS 12,14
 BLOCK 15 LOTS 5,6,7,8,9,10,11,12
 BOROUGH OF SEA BRIGHT MONMOUTH COUNTY NEW JERSEY

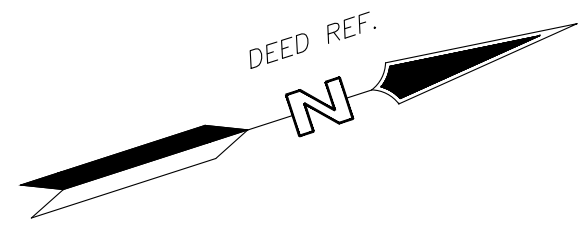
WJH
ENGINEERING

CERT. OF AUTH. NO. 24G428117300
 257 MONMOUTH ROAD,
 BLDG. A, STE. 7,
 OAKHURST, NJ 07755
 PHONE: 732-223-1313
 WWW.WJHENGINEERING.COM

EXISTING CONDITIONS PHASING PLAN

WALTER JOSEPH HOPKIN
 N.J. PROFESSIONAL ENGINEER, L.I.C. No. 40673

SCALE:	DRAWN BY:	DATE:	JOB No.:	SHEET No.:
1" = 30'	J.L.	5/30/23	19179A	1 OF 2



PHASE II AREA
 TOTAL DISTURBANCE = 61,170 SF (1.404 AC)
 TOTAL IMPERVIOUS = 45,151 SF (1.037 AC)
 MOTOR VEHICLE SURFACES = 24,864 SF (0.571 AC)

PHASE III AREA
 TOTAL DISTURBANCE = 16,386 SF (0.376 AC)
 TOTAL IMPERVIOUS = 13,450 SF (0.309 AC)
 MOTOR VEHICLE SURFACES = 129 SF (0.003 AC)

PHASE IV AREA
 TOTAL DISTURBANCE = 32,720 SF (0.751 AC)
 TOTAL IMPERVIOUS = 30,071 SF (0.690 AC)
 MOTOR VEHICLE SURFACES = 12,181 SF (0.280 AC)

PHASE I AREA
 TOTAL DISTURBANCE = 47,934 SF (1.100 AC)
 TOTAL IMPERVIOUS = 24,489 SF (0.562 AC)
 MOTOR VEHICLE SURFACES = 3,099 SF (0.071 AC)



- LEGEND**
- GAS VALVE
 - WATER VALVE
 - WATER WELL
 - UTILITY MANHOLE
 - DRAINAGE MANHOLE
 - ELECTRICAL MANHOLE
 - SANITARY MANHOLE
 - TELEPHONE MANHOLE
 - TRAFFIC SIGN
 - TRAFFIC SIGN (2 POST)
 - STREET SIGN
 - LIGHT POST
 - GROUND LIGHT
 - UTILITY POLE
 - FIRE HYDRANT
 - DRAINAGE INLET (TYPE "A")
 - DRAINAGE INLET (TYPE "B")
 - DRAINAGE INLET (TYPE "C")
 - DRAINAGE INLET (TYPE "E")
 - DRAINAGE LINE
 - ELECTRIC LINE
 - GAS LINE
 - SANITARY SEWER LINE
 - TELEPHONE LINE
 - WATER LINE
 - OVERHEAD WIRES
 - MONITORING WELL
 - IRON/ALUMINUM PIPE FOUND
 - IRON BAR FOUND
 - CONCRETE MONUMENT FOUND
 - SURVEY
 - FILE MAP
 - GAS METER
 - DEPRESSED CURB
 - FLUSH CURB

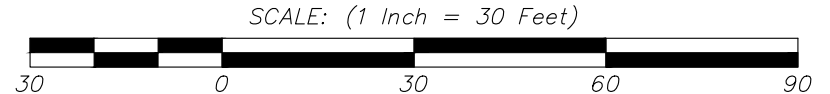
PHASING NOTES:

1. PHASE I:
 - REMOVAL OF EXISTING BUILDINGS/STRUCTURES WITHIN CONSTRUCTION PHASE I AREA.
 - CONSTRUCTION OF PROPOSED UTILITIES.
 - CONSTRUCTION OF DRAINAGE INLETS DI-57, DI-58, DI-59 & DI-SAB, AND ALL ASSOCIATED CONVEYANCE PIPES. DI-59 WILL BE CAPPED AS DI-S12 AND ASSOCIATED CONVEYANCE PIPE WILL NOT BE CONSTRUCTED UNTIL PHASE II.
 - CONNECTION TO THE EXISTING DRAINAGE SYSTEM IN FRONT STREET.
 - SITE GRADING.
 - CONSTRUCTION OF UNITS A-1, A-2, A-3 & A-4.
 - MILL AND OVERLAY PORTION OF EXISTING FRONT STREET.
 - CONSTRUCTION OF THE BOAT RAMP EXTENSION.
 - CONSTRUCTION OF PORTION OF PAVER WALK, GRAVEL WALK, AND BOARDWALK.
 - INSTALL LANDSCAPING.
2. PHASE II:
 - REMOVAL OF EXISTING BUILDINGS/STRUCTURES WITHIN CONSTRUCTION PHASE II AREA.
 - CONSTRUCTION OF PROPOSED UTILITIES.
 - CONSTRUCTION OF DRAINAGE INLET DI-S12 AND CONVEYANCE PIPE AND CONNECTION TO DI-S9, CONSTRUCTED IN PHASE I.
 - CONSTRUCTION OF THE REMAINDER OF THE STORMWATER DRAINAGE SYSTEM, EXCEPT FOR DRAINAGE INLETS DI-E1 & DI-E2 AND DRAINAGE YARD INLETS DI-Y2, DI-Y3, & DI-Y4, WHICH ARE LOCATED OUTSIDE OF THE PHASE II AREA.
 - CONSTRUCTION OF THE PROPOSED PUMP STATION WITHIN RIVER STREET.
 - SITE GRADING.
 - CONSTRUCTION OF UNITS B-1, B-2, B-3, B-4, B-5, B-6, & B-7.
 - CONSTRUCTION OF THE PROPOSED ROADWAYS.
 - CONSTRUCTION OF PERVIOUS PAVER PARKING.
 - CONSTRUCTION OF PAVER WALKS.
 - CONSTRUCTION OF THE DOG PARK TURF AREA.
 - INSTALL LANDSCAPING.
3. PHASE III:
 - REMOVAL OF EXISTING BUILDINGS/STRUCTURES WITHIN CONSTRUCTION PHASE III AREA.
 - CONSTRUCTION OF PROPOSED UTILITIES.
 - CONSTRUCTION OF DRAINAGE YARD INLETS DI-Y2, DI-Y3 & DI-Y4, ASSOCIATED CONVEYANCE PIPES, AND CONNECTION TO DI-C1, CONSTRUCTED IN PHASE II.
 - SITE GRADING.
 - CONSTRUCTION OF THE ACCESS DRIVEWAYS ALONG CHURCH STREET AND SOUTH STREET.
 - CONSTRUCTION OF THE CONDOMINIUM BUILDING.
 - CONSTRUCTION OF THE BOAT RAMP EXTENSION.
 - CONSTRUCTION OF PORTION OF PAVER WALK, GRAVEL WALK, AND BOARDWALK.
 - INSTALL LANDSCAPING.
4. PHASE IV:
 - REMOVAL OF EXISTING BUILDINGS/STRUCTURES WITHIN CONSTRUCTION PHASE IV AREA.
 - CONSTRUCTION OF PROPOSED UTILITIES.
 - CONSTRUCTION OF DRAINAGE INLETS DI-E1 & DI-E2, ASSOCIATED CONVEYANCE PIPES, AND CONNECTION TO DMH-S19, CONSTRUCTED IN PHASE II.
 - SITE GRADING.
 - CONSTRUCTION OF THE PROPOSED ROADWAYS.
 - CONSTRUCTION OF UNITS C-1, C-2, C-3, C-4, C-5, C-6, C-7, C-8, C-9, C-10, C-11, C-12, C-13, C-14, C-15, C-16, C-17 & C-18.
 - CONSTRUCTION OF THE PAVER WALKS.
 - INSTALL LANDSCAPING.

NOTE:
 THE PROJECT IS LOCATED WITHIN AN URBAN REDEVELOPMENT AREA, REDUCES THE OVERALL IMPERVIOUS AREAS, INCLUDING A REDUCTION OF MOTOR VEHICLE IMPERVIOUS AREA. THE STORMWATER RUNOFF FROM THE DEVELOPMENT DISCHARGES DIRECTLY INTO TIDAL WATERS. THEREFORE, THE PROJECT IS EXEMPTED FROM THE STORMWATER GROUNDWATER RECHARGE, RUNOFF QUALITY TREATMENT, AND QUANTITY CONTROL REQUIREMENTS AS OUTLINED IN N.J.A.C. 7:8 FOR MAJOR DEVELOPMENTS.

PHASING PLAN AREAS SUMMARY					
	DISTURBANCE	AREA	EXISTING	PROPOSED	NET
PHASE I	1.100 AC	TOTAL IMPERVIOUS	0.344 AC	0.562 AC	0.218 AC
		MOTOR VEHICLE	0.261 AC	0.071 AC	- 0.190 AC
PHASE II	1.404 AC	TOTAL IMPERVIOUS	1.119 AC	1.037 AC	- 0.082 AC
		MOTOR VEHICLE	0.826 AC	0.571 AC	- 0.255 AC
PHASE III	0.376 AC	TOTAL IMPERVIOUS	0.282 AC	0.309 AC	0.027 AC
		MOTOR VEHICLE	0.129 AC	0.003 AC	- 0.126 AC
PHASE IV	0.751 AC	TOTAL IMPERVIOUS	0.427 AC	0.690 AC	0.263 AC
		MOTOR VEHICLE	0.127 AC	0.280 AC	- 0.153 AC

NOTE:
 THE PHASING AREAS INCLUDE OF THE PROJECT SITE AREA AND ADJACENT ROADWAYS IMPROVEMENTS.



NO.	DATE	DESCRIPTION	DRAWN BY
PRELIMINARY MAJOR SITE PLAN BLOCK 13 LOTS 13-18, 20 & 21 BLOCK 14 LOTS 12, 14 BLOCK 15 LOTS 5-12 BOROUGH OF SEA BRIGHT MONMOUTH COUNTY NEW JERSEY			
		CERT. OF AUTH. NO. 24GA28117300 257 MONMOUTH ROAD, BLDG. A, STE. 7, OAKHURST, NJ 07755 PHONE: 732-229-1313 WWW.WJHENGINEERING.COM	
PHASING-DRAINAGE PLAN WALTER JOSEPH HOPKIN N.J. PROFESSIONAL ENGINEER, LIC. NO. 40673			
SCALE:	DRAWN BY:	DATE:	JOB No.:
1" = 30'	KMB	5/30/23	19179A
			SHEET No.:
			2 OF 2