March 15, 2022

Thomas J. Roy, PE
Director of Public Works/Town Engineer
Town of Simsbury
933 Hopmeadow Street
Simsbury, CT 06070

Re: Engineering Comments – Latimer Lane School Renovations
33 Mountain View Road
Simsbury, Connecticut
SLR #14485.00037.0030

Dear Mr. Roy,

SLR International Corporation (SLR) is in receipt of a memorandum from you addressed to Thomas Hazel, Assistant Town Planner for the Town of Simsbury dated March 1, 2022, regarding the above-referenced project. We offer the following responses to the comments therein:

C9. The Pond Report for UG DET 210 has the outlet pipe as 15" diameter at a length of 47-feet with a slope of 2.55% whereas on Sheet C-100 it states an outlet pipe of 15" diameter at a length of 53-feet with a slope of 2.26%. Revise as necessary.

The Pond Report for UG DET 210 has been revised to match Sheet C-100.

This comment has not been adequately addressed. The Pond Report and Sheet C-100 still reflect this same mismatching info.

R9. Attached is the Pond Report for UG DET 210 matches Sheet C-100.

C10. Relocated proposed manhole structures #1 & #2 in entrance drive to bus drop-off area as proposed location may create future maintenance issues.

These manhole locations are set by the need to intercept the existing drainage system.

MH1 is set to intercept the existing drainage system. Consider relocating MH2 outside of the entrance driveto prevent future maintenance issues.

R10. MH 2 has been relocated outside of the entrance drive. This change will be reflected on the final plans. See attached.

C12. Provide riprap protection at outlet to stormwater system discharging to watercourse.

The existing outlet will be used and the need to install riprap will be investigated.

This comment has not been adequately addressed. Identify whether riprap protection will be proposed at this discharge location.

R12. An investigation has shown the headwall and adjacent pipe has settled and is disjointed from the upstream pipe. The existing concrete headwall and pipe will be replaced. A new riprap splash pad will be installed and will be shown on the final plans. See attached.

C13. Provide sidewalk ramps which comply with ADA standards as well as details for them. These details shall include but not be limited to material type, maximum slope requirements and detectible warning pads.

Details have been added to Sheet L-502 prepared by Richter and Cegan.

The Ramped Sidewalk Curb Ramp Detail applies to the ramp to the east of the northern proposed addition. A ramp detail is needed for the ramp to the north of the northern proposed addition. Confirm whether a ramp is proposed at the crosswalk to the east of the renovated school or if this will be a crosswalk abutting a curb.

R13. Additional curb ramp details will be added to the final plans. Please see the attached Ramped Sidewalk Curb Ramp – Type 2 for the curb ramp at the north addition. A curb ramp can be provided at the crosswalk to the east of the school – please see attached Curb Ramp on Radius.

C. The following comments are new comments in response to the materials submitted with the Zoning Application:

C14. The UG DET 110 Pond Report shows an outlet pipe of 24" Diameter, Inv. Elevation 182.70, Length 25', Slope 2.80%. The Plan View shows this outlet pipe to be 24" Diameter, Inv. elevation 182.70,Length 141', Slope 1.21%. Revise the drainage report and plan set appropriately to reflect an outlet pipewith the same length and slope.

R14. Attached is the UG DET 110 Pond Report that matches Sheet C-100.

C15. The Outlet Control Structure for System 210 Detail is not consistent with the drainage report. Low-Flow orifice 1 has invert 179.0 in the detail, Culvert/Orifice B has invert 179.40 in the Pond Report. Low Flow orifice 2 has invert 180.4 in the detail, Culvert/Orifice C has invert 180.80 in the Pond Report. The 15" outlet pipe has invert 177.8 in the detail, the 15" outlet pipe has elevation 178.20

in the Pond Report.

R15. The outlet control structure detail for UG 210 matches the drainage report.

C16. The Traffic Report determined that the current number of parent drop-off trips will increase from 224/136 in the morning/afternoon peak hour to 270/160 in the 2027-2028 school year. There is a brief discussion in the conclusion on the queues on Mountain View Drive that exists but no discussion of how much larger this queue will increase in the future. Please expand on the future queue capacity on Mountain View Road and how this could be mitigated. Alternatives for queuing should be explored.

R16. As outlined in our report, we recommend that the school open 15 minutes earlier in the mornings in order to spread out the school drop-off traffic over a larger time period. During both pick-up and drop-off, the school could further mitigate queues by loading and unloading a greater number of cars in the loop at a time. We also note that the school pick-up and drop-off queuing has co-existed with traffic on Mountain View Drive over the years, in part due to the light volume of traffic in the area and the ability to queue on the west side shoulder.

C17. The Traffic Report discusses pedestrians that currently use Mountain View Drive but no sidewalks are provided off site. Consider sidewalks along the east side of Mountain View Drive from school entrance drive crosswalk to Colonial Drive.

R17. It our understanding the Town is in the process of implementing sidewalk improvements as a separate project. In general, we support any enhancement of the pedestrian environment near the school.

C18. Proposed closure gate at the bus drop off exit drive will reduce the effective width of the adjacent sidewalk area. Consider widening the sidewalk in this area to accommodate the encroachment.

R18. The existing walk is 8’ wide but includes a painted line 2’ from face of curb to direct students to walk 2’ away from the curb edge. Per the discussion with the principal, the new walk is 10’ wide to allow for an effective 8’ wide walk plus 2’ striped area. The new gate will sit 18” from the face of curb (so within the 2’ striped zone) to avoid conflicting with the 8’ wide section of walk used by the students.

C19. Areas for managing dumpsters should be reinforced concrete instead of bituminous concrete.

R19. There is reinforced concrete pavement area under the proposed dumpster locations. A note will be added to L1.21 to clarify – please see the attached L-121 Partial Plan.

C20. Identify the paint color, width, spacing, etc. of the crosswalks on-site. Provide a detail for the

crosswalks, as necessary.

R20. See enclosed detail that will be included on the final plans.

C21. Is the parking provided at the school adequate for this site given the upgrades to the school?

R21. Yes. Based on the existing parking demand of 0.8 spaces per staff member, the future parking demand for 90 staff members is approximately 70 parked vehicles. The proposed parking area is expected to comfortably accommodate those future parking demands.

C22. This favorable recommendation is subject to resolution of these outstanding comments to the satisfaction of the Engineering Department prior to final sign-off of the project.

R22. Comment Noted.

If you have any further questions regarding these comments, please do not hesitate to contact me at (203) 271-1773.

Sincerely,

SLR International Corporation

Thomas J. Daly, PE
US Manager of Civil & Structural Engineering

Enclosure

cc: Thomas Hazel, Assistant Town Planner – Town of Simsbury
Daniel F. Gannon, Project Engineer – Town of Simsbury
Anthony Piazza, Superintendent, Water Pollution Control Authority – Town of Simsbury
Laura Barkowski, Code Compliance Officer, Planning and Land Use Department – Town of Simsbury

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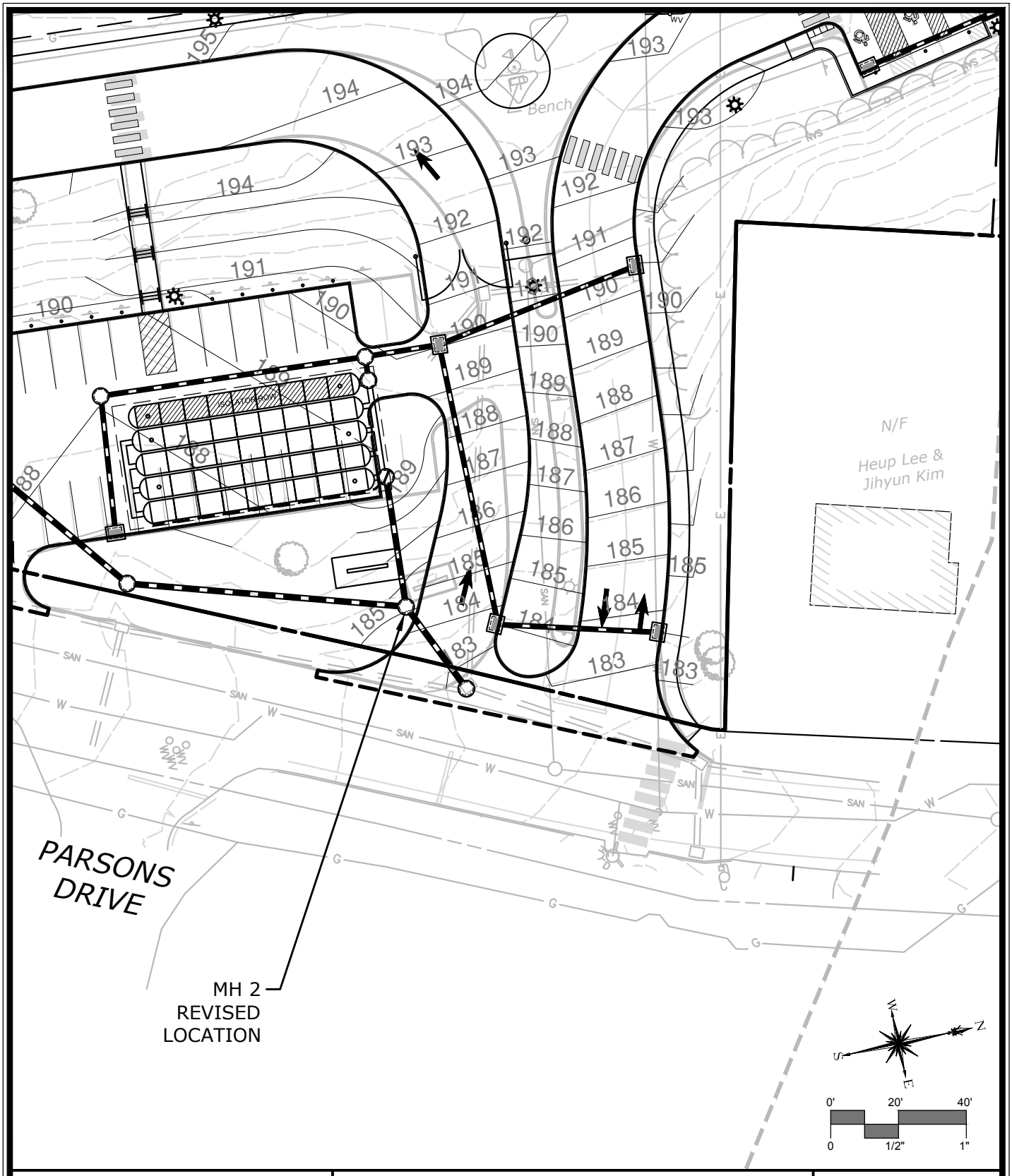


SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

UTILITIES SKETCH 1 (COMMENT 10)

LATIMER LANE SCHOOL RENOVATION

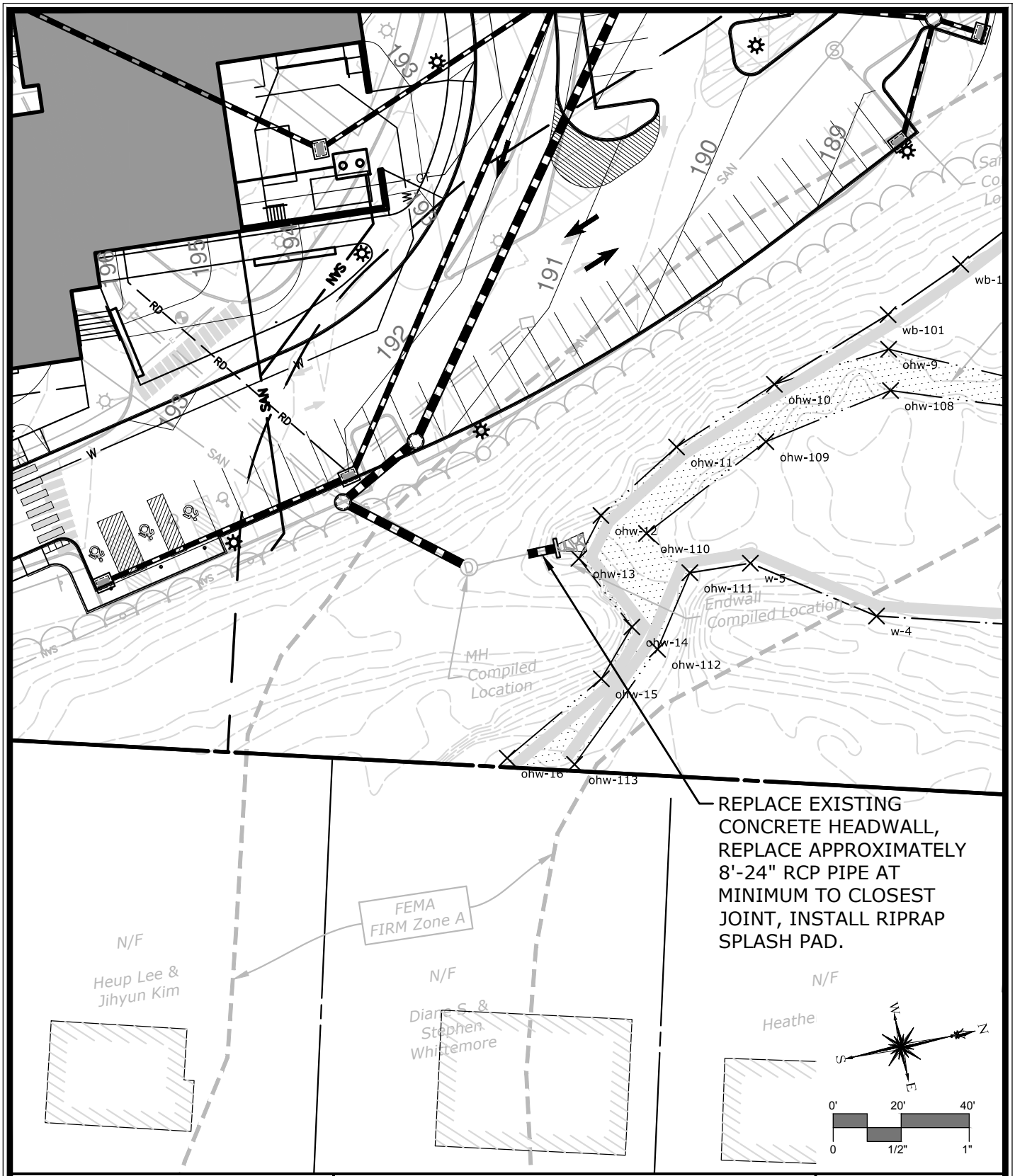
33 MOUNTAIN VIEW DRIVE
WEATOGUE, CONNECTICUT

DATE	**MARCH 15, 2022**
SCALE	**1"=40'**
PROJ. NO.	**14885.00037**

DESIGNED	DRAWN	CHECKED
AWG	**AWG**	**TD**

DRAWING NAME:

FIG. 1



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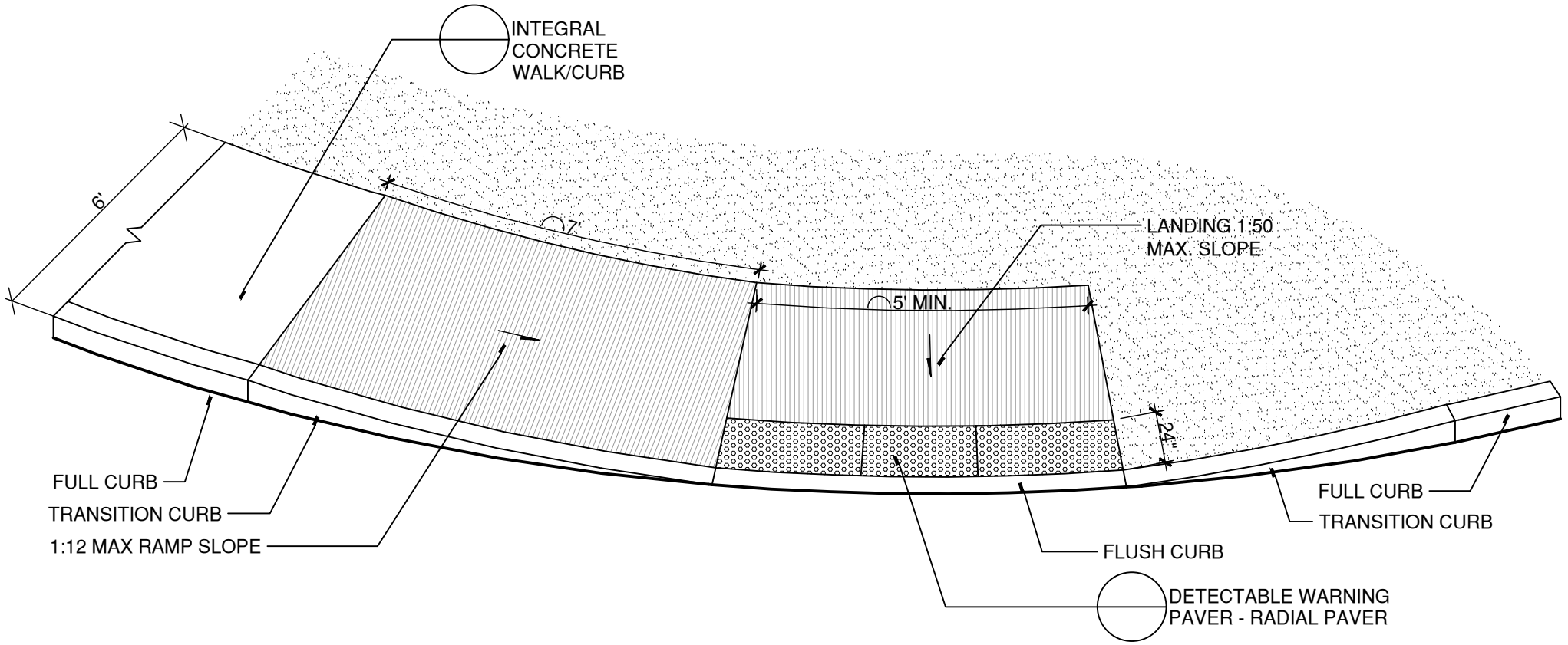
UTILITIES SKETCH 2 (COMMENT 12)

LATIMER LANE SCHOOL RENOVATION

33 MOUNTAIN VIEW DRIVE
WEATOGUE, CONNECTICUT

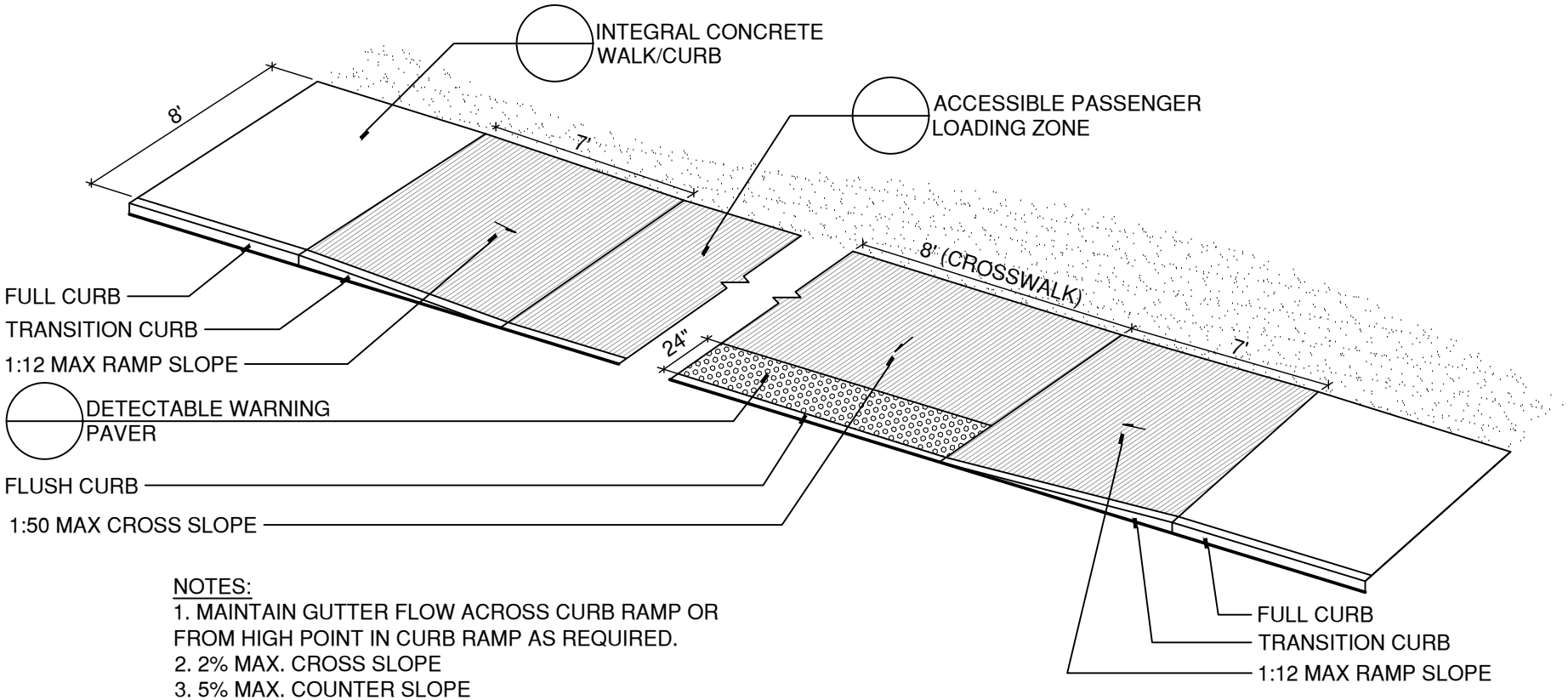
DATE	**MARCH 15, 2022**
SCALE	**1"=40'**
PROJ. NO.	**14885.00037**
DESIGNED **AWG** / DRAWN **AWG** / CHECKED **TD**	
DRAWING NAME:	**FIG. 2**



CURB RAMP ON RADIUS

SCALE: N.T.S.

W:\2021014\3DESDEV\DETAILS\RADIUS CURB RAMP.DWG

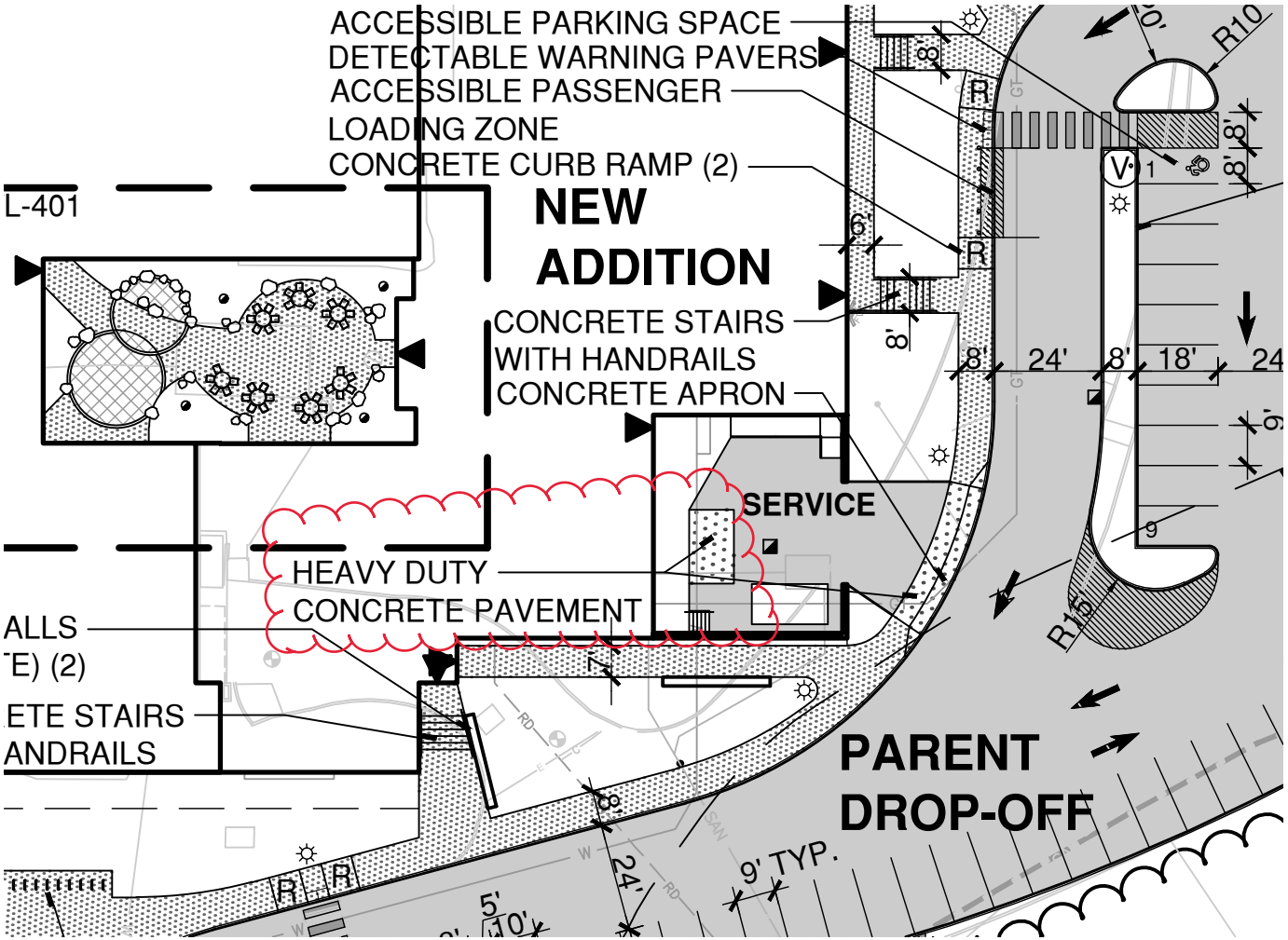


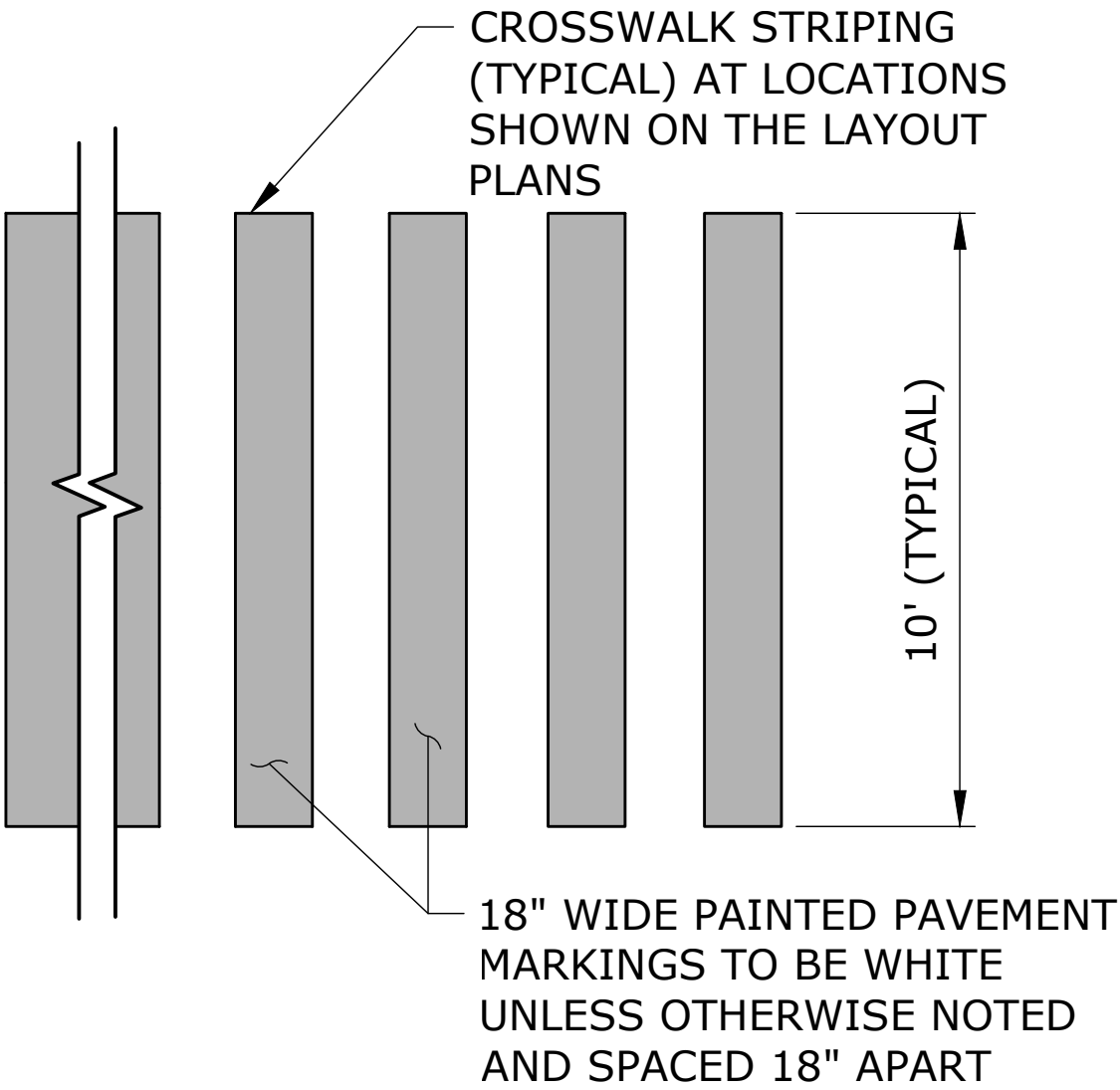
NOTES:
1. MAINTAIN GUTTER FLOW ACROSS CURB RAMP OR FROM HIGH POINT IN CURB RAMP AS REQUIRED.
2. 2% MAX. CROSS SLOPE
3. 5% MAX. COUNTER SLOPE

RAMPED SIDEWALK CURB RAMP - TYPE 2

SCALE: N.T.S.

W:\2020014\3DESDEV\DETAILS\RAMPED SIDEWALK CURB RAMP - TYPE 2.DWG

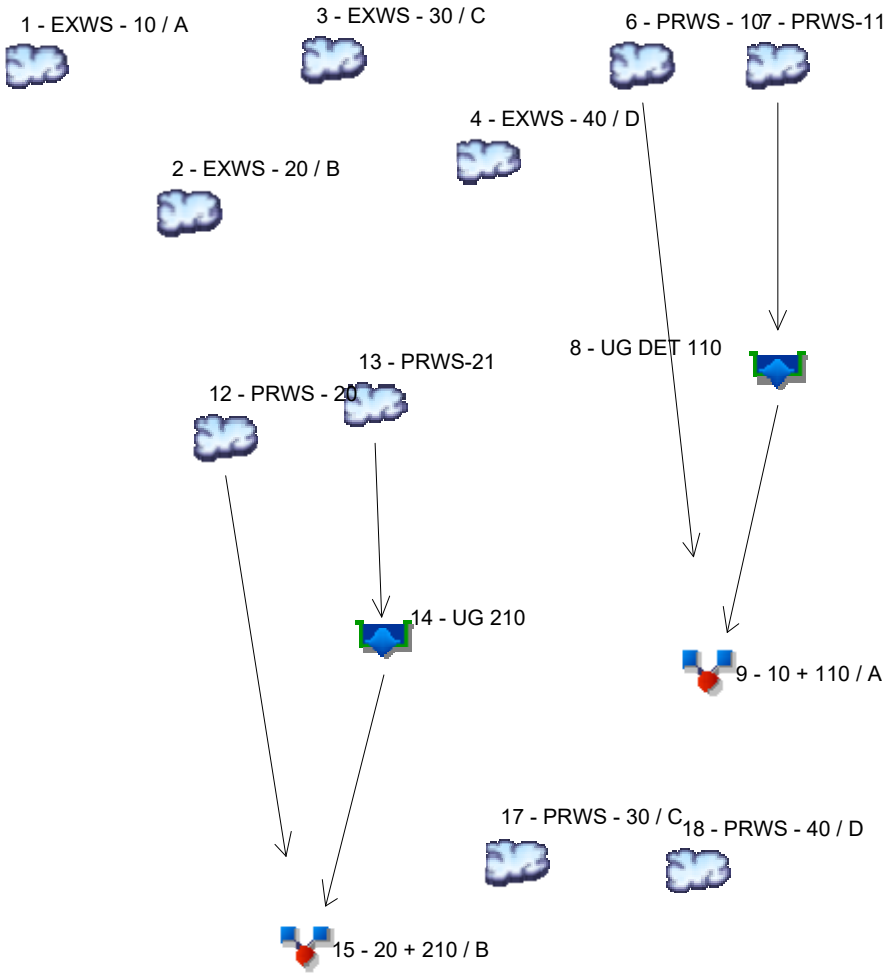

ACCESSIBLE PARKING SPACE
DETECTABLE WARNING PAVERS
ACCESSIBLE PASSENGER
LOADING ZONE
CONCRETE CURB RAMP (2)
L-401
NEW
ADDITION
CONCRETE STAIRS
WITH HANDRAILS
CONCRETE APRON
SERVICE
HEAVY DUTY
CONCRETE PAVEMENT
ALLS
E) (2)
ETE STAIRS
ANDRAILS
PARENT
DROP-OFF
9' TYP.
24'
8'
6'
24'
18'
R10
R15
R
V-1



CROSSWALK PAVEMENT MARKING

NOT TO SCALE

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	EXWS - 10 / A
2	SCS Runoff	EXWS - 20 / B
3	SCS Runoff	EXWS - 30 / C
4	SCS Runoff	EXWS - 40 / D
6	SCS Runoff	PRWS - 10
7	SCS Runoff	PRWS-11
8	Reservoir	UG DET 110
9	Combine	10 + 110 / A
12	SCS Runoff	PRWS - 20
13	SCS Runoff	PRWS-21
14	Reservoir	UG 210
15	Combine	20 + 210 / B
17	SCS Runoff	PRWS - 30 / C
18	SCS Runoff	PRWS - 40 / D

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	8.308	-------	-------	19.12	26.33	31.65	37.65	EXWS - 10 / A
2	SCS Runoff	------	-------	8.486	-------	-------	19.95	27.66	33.38	39.82	EXWS - 20 / B
3	SCS Runoff	------	-------	3.411	-------	-------	7.662	10.46	12.52	14.83	EXWS - 30 / C
4	SCS Runoff	------	-------	2.182	-------	-------	5.500	7.803	9.525	11.48	EXWS - 40 / D
6	SCS Runoff	------	-------	1.976	-------	-------	5.414	7.876	9.736	11.86	PRWS - 10
7	SCS Runoff	------	-------	8.027	-------	-------	15.46	20.12	23.50	27.27	PRWS-11
8	Reservoir	7	-------	6.463	-------	-------	13.75	18.27	21.83	25.95	UG DET 110
9	Combine	6, 8	-------	8.311	-------	-------	18.92	25.68	31.21	37.62	10 + 110 / A
12	SCS Runoff	------	-------	8.243	-------	-------	18.97	26.12	31.41	37.35	PRWS - 20
13	SCS Runoff	------	-------	1.745	-------	-------	3.393	4.430	5.181	6.018	PRWS-21
14	Reservoir	13	-------	0.288	-------	-------	1.018	1.551	1.887	2.801	UG 210
15	Combine	12, 14	-------	8.462	-------	-------	19.61	27.53	33.15	39.71	20 + 210 / B
17	SCS Runoff	------	-------	3.315	-------	-------	7.285	9.880	11.78	13.92	PRWS - 30 / C
18	SCS Runoff	------	-------	2.182	-------	-------	5.500	7.803	9.525	11.48	PRWS - 40 / D

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	8.308	3	735	0.877	------	------	------	EXWS - 10 / A
2	SCS Runoff	8.486	3	735	0.901	------	------	------	EXWS - 20 / B
3	SCS Runoff	3.411	3	729	0.314	------	------	------	EXWS - 30 / C
4	SCS Runoff	2.182	3	735	0.237	------	------	------	EXWS - 40 / D
6	SCS Runoff	1.976	3	735	0.223	------	------	------	PRWS - 10
7	SCS Runoff	8.027	3	732	0.823	------	------	------	PRWS-11
8	Reservoir	6.463	3	744	0.717	7	185.65	0.224	UG DET 110
9	Combine	8.311	3	741	0.940	6, 8	------	------	10 + 110 / A
12	SCS Runoff	8.243	3	735	0.870	------	------	------	PRWS - 20
13	SCS Runoff	1.745	3	726	0.133	------	------	------	PRWS-21
14	Reservoir	0.288	3	756	0.097	13	179.64	0.065	UG 210
15	Combine	8.462	3	735	0.967	12, 14	------	------	20 + 210 / B
17	SCS Runoff	3.315	3	729	0.304	------	------	------	PRWS - 30 / C
18	SCS Runoff	2.182	3	735	0.237	------	------	------	PRWS - 40 / D

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	19.12	3	732	1.962	------	------	------	EXWS - 10 / A
2	SCS Runoff	19.95	3	732	2.050	------	------	------	EXWS - 20 / B
3	SCS Runoff	7.662	3	729	0.692	------	------	------	EXWS - 30 / C
4	SCS Runoff	5.500	3	732	0.569	------	------	------	EXWS - 40 / D
6	SCS Runoff	5.414	3	732	0.566	------	------	------	PRWS - 10
7	SCS Runoff	15.46	3	732	1.605	------	------	------	PRWS-11
8	Reservoir	13.75	3	738	1.499	7	186.54	0.293	UG DET 110
9	Combine	18.92	3	738	2.065	6, 8	------	------	10 + 110 / A
12	SCS Runoff	18.97	3	732	1.947	------	------	------	PRWS - 20
13	SCS Runoff	3.393	3	726	0.264	------	------	------	PRWS-21
14	Reservoir	1.018	3	747	0.227	13	180.89	0.121	UG 210
15	Combine	19.61	3	732	2.174	12, 14	------	------	20 + 210 / B
17	SCS Runoff	7.285	3	729	0.658	------	------	------	PRWS - 30 / C
18	SCS Runoff	5.500	3	732	0.569	------	------	------	PRWS - 40 / D

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	26.33	3	732	2.702	------	------	------	EXWS - 10 / A
2	SCS Runoff	27.66	3	732	2.837	------	------	------	EXWS - 20 / B
3	SCS Runoff	10.46	3	729	0.947	------	------	------	EXWS - 30 / C
4	SCS Runoff	7.803	3	732	0.801	------	------	------	EXWS - 40 / D
6	SCS Runoff	7.876	3	732	0.812	------	------	------	PRWS - 10
7	SCS Runoff	20.12	3	732	2.112	------	------	------	PRWS-11
8	Reservoir	18.27	3	738	2.006	7	187.11	0.328	UG DET 110
9	Combine	25.68	3	738	2.818	6, 8	------	------	10 + 110 / A
12	SCS Runoff	26.12	3	732	2.681	------	------	------	PRWS - 20
13	SCS Runoff	4.430	3	726	0.349	------	------	------	PRWS-21
14	Reservoir	1.551	3	744	0.312	13	181.56	0.147	UG 210
15	Combine	27.53	3	732	2.993	12, 14	------	------	20 + 210 / B
17	SCS Runoff	9.880	3	729	0.896	------	------	------	PRWS - 30 / C
18	SCS Runoff	7.803	3	732	0.801	------	------	------	PRWS - 40 / D

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	31.65	3	732	3.256	------	------	------	EXWS - 10 / A
2	SCS Runoff	33.38	3	732	3.429	------	------	------	EXWS - 20 / B
3	SCS Runoff	12.52	3	729	1.138	------	------	------	EXWS - 30 / C
4	SCS Runoff	9.525	3	732	0.977	------	------	------	EXWS - 40 / D
6	SCS Runoff	9.736	3	732	1.000	------	------	------	PRWS - 10
7	SCS Runoff	23.50	3	732	2.486	------	------	------	PRWS-11
8	Reservoir	21.83	3	738	2.379	7	187.64	0.347	UG DET 110
9	Combine	31.21	3	735	3.379	6, 8	------	------	10 + 110 / A
12	SCS Runoff	31.41	3	732	3.231	------	------	------	PRWS - 20
13	SCS Runoff	5.181	3	726	0.411	------	------	------	PRWS-21
14	Reservoir	1.887	3	741	0.375	13	182.16	0.166	UG 210
15	Combine	33.15	3	732	3.605	12, 14	------	------	20 + 210 / B
17	SCS Runoff	11.78	3	729	1.074	------	------	------	PRWS - 30 / C
18	SCS Runoff	9.525	3	732	0.977	------	------	------	PRWS - 40 / D

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	37.65	3	732	3.888	------	------	------	EXWS - 10 / A
2	SCS Runoff	39.82	3	732	4.105	------	------	------	EXWS - 20 / B
3	SCS Runoff	14.83	3	729	1.356	------	------	------	EXWS - 30 / C
4	SCS Runoff	11.48	3	732	1.179	------	------	------	EXWS - 40 / D
6	SCS Runoff	11.86	3	732	1.216	------	------	------	PRWS - 10
7	SCS Runoff	27.27	3	732	2.906	------	------	------	PRWS-11
8	Reservoir	25.95	3	735	2.800	7	188.11	0.365	UG DET 110
9	Combine	37.62	3	735	4.016	6, 8	------	------	10 + 110 / A
12	SCS Runoff	37.35	3	732	3.858	------	------	------	PRWS - 20
13	SCS Runoff	6.018	3	726	0.482	------	------	------	PRWS-21
14	Reservoir	2.801	3	738	0.445	13	182.96	0.182	UG 210
15	Combine	39.71	3	732	4.303	12, 14	------	------	20 + 210 / B
17	SCS Runoff	13.92	3	729	1.276	------	------	------	PRWS - 30 / C
18	SCS Runoff	11.48	3	732	1.179	------	------	------	PRWS - 40 / D

Hydraflow Table of Contents

LLS-Model01.gpw

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Monday, 03 / 14 / 2022

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Monday, 03 / 14 / 2022

Pond No. 2 - UG DET 110

Pond Data

UG Chambers -Invert elev. = 183.45 ft, Rise x Span = 3.75 x 6.42 ft, Barrel Len = 7.17 ft, No. Barrels = 88, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 182.70 ft, Width = 6.42 ft, Height = 5.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	182.70	n/a	0.000	0.000
0.55	183.25	n/a	0.020	0.020
1.10	183.80	n/a	0.040	0.060
1.65	184.35	n/a	0.051	0.111
2.20	184.90	n/a	0.050	0.161
2.75	185.45	n/a	0.048	0.208
3.30	186.00	n/a	0.045	0.253
3.85	186.55	n/a	0.041	0.294
4.40	187.10	n/a	0.033	0.327
4.95	187.65	n/a	0.021	0.349
5.50	188.20	n/a	0.020	0.369

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	0.00	0.00	0.00
Span (in)	= 24.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 182.70	0.00	0.00	0.00
Length (ft)	= 141.00	0.00	0.00	0.00
Slope (%)	= 1.21	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.75	1.25	0.00	0.00
Crest El. (ft)	= 187.70	184.30	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	182.70	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
0.55	0.020	183.25	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
1.10	0.060	183.80	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
1.65	0.111	184.35	0.05 ic	---	---	---	0.00	0.05	---	---	---	---	0.047
2.20	0.161	184.90	1.99 ic	---	---	---	0.00	1.93	---	---	---	---	1.935
2.75	0.208	185.45	5.16 ic	---	---	---	0.00	5.13	---	---	---	---	5.133
3.30	0.253	186.00	9.23 ic	---	---	---	0.00	9.23	---	---	---	---	9.226
3.85	0.294	186.55	13.90 ic	---	---	---	0.00	13.87 s	---	---	---	---	13.87
4.40	0.327	187.10	18.19 ic	---	---	---	0.00	18.19 s	---	---	---	---	18.19
4.95	0.349	187.65	22.11 ic	---	---	---	0.00	22.11 s	---	---	---	---	22.11
5.50	0.369	188.20	27.00 ic	---	---	---	3.24	23.77 s	---	---	---	---	27.00

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Monday, 03 / 14 / 2022

Pond No. 1 - UG DET 210

Pond Data

UG Chambers -Invert elev. = 178.55 ft, Rise x Span = 3.75 x 6.42 ft, Barrel Len = 7.17 ft, No. Barrels = 45, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 177.80 ft, Width = 6.42 ft, Height = 5.50 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	177.80	n/a	0.000	0.000
0.55	178.35	n/a	0.010	0.010
1.10	178.90	n/a	0.020	0.031
1.65	179.45	n/a	0.026	0.057
2.20	180.00	n/a	0.025	0.082
2.75	180.55	n/a	0.024	0.107
3.30	181.10	n/a	0.023	0.129
3.85	181.65	n/a	0.021	0.150
4.40	182.20	n/a	0.017	0.167
4.95	182.75	n/a	0.011	0.178
5.50	183.30	n/a	0.010	0.189

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	4.00	6.00	0.00
Span (in)	= 15.00	4.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 177.80	179.00	180.40	0.00
Length (ft)	= 35.00	0.00	0.00	0.00
Slope (%)	= 0.57	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.50	0.50	0.00	0.00
Crest El. (ft)	= 182.90	182.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

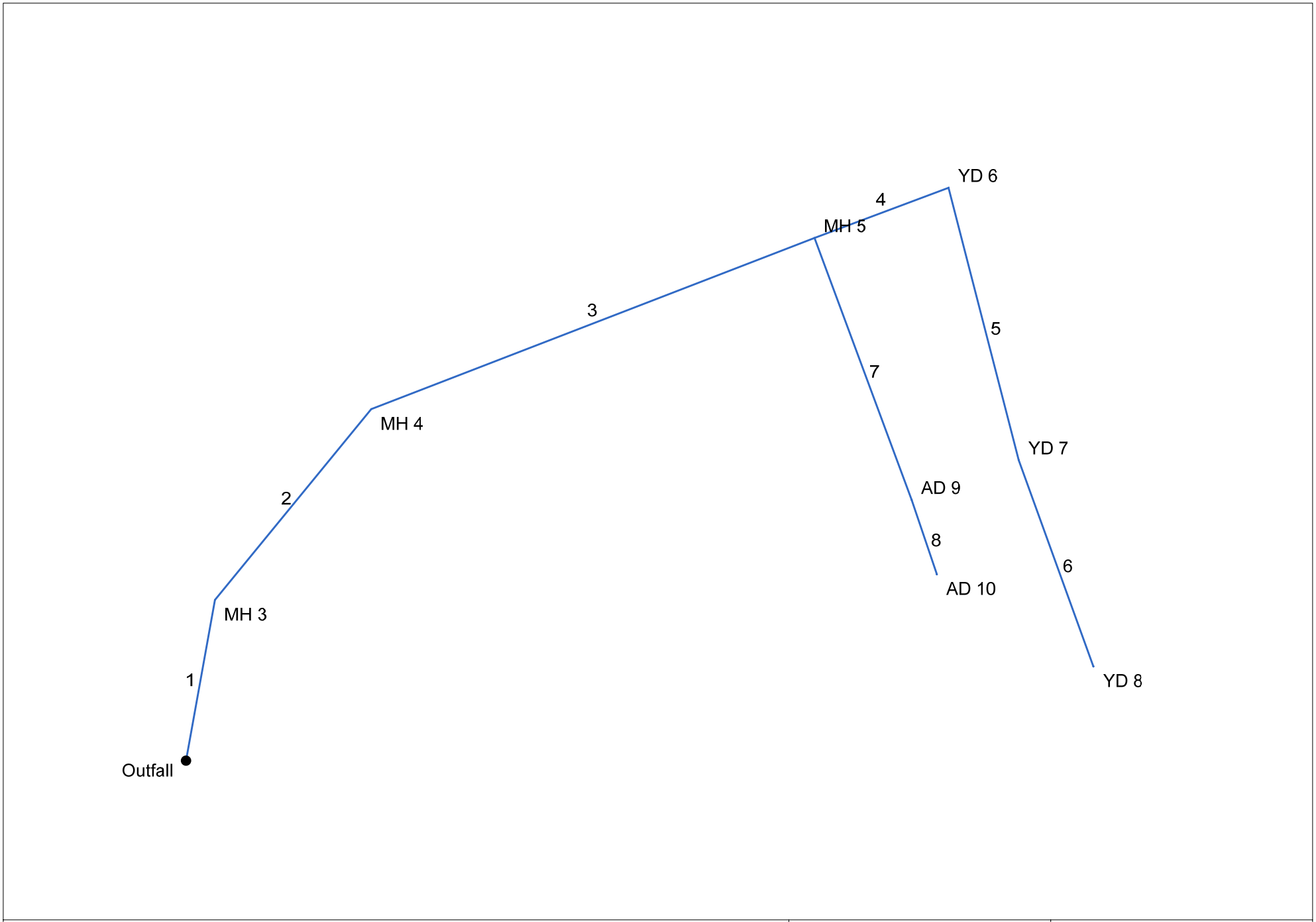
Exfil.(in/hr) = 0.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	177.80	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
0.55	0.010	178.35	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.10	0.031	178.90	0.00	0.00	0.00	---	0.00	0.00	---	---	---	---	0.000
1.65	0.057	179.45	0.23 ic	0.22 ic	0.00	---	0.00	0.00	---	---	---	---	0.224
2.20	0.082	180.00	0.39 ic	0.38 ic	0.00	---	0.00	0.00	---	---	---	---	0.384
2.75	0.107	180.55	0.56 ic	0.49 ic	0.07 ic	---	0.00	0.00	---	---	---	---	0.560
3.30	0.129	181.10	1.23 oc	0.58 ic	0.63 ic	---	0.00	0.00	---	---	---	---	1.218
3.85	0.150	181.65	1.62 oc	0.66 ic	0.95 ic	---	0.00	0.00	---	---	---	---	1.607
4.40	0.167	182.20	1.94 oc	0.73 ic	1.18 ic	---	0.00	0.00	---	---	---	---	1.909
4.95	0.178	182.75	2.40 oc	0.80 ic	1.37 ic	---	0.00	0.21	---	---	---	---	2.373
5.50	0.189	183.30	6.47 oc	0.79 ic	1.54 ic	---	2.95	1.19	---	---	---	---	6.466

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: System 200-02.stm	Number of lines: 8	Date: 3/14/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	79.000	-79.838	None	0.00	0.00	0.00	0.0	177.60	2.78	179.80	15	Cir	0.012	0.54	187.00	MH 2 - MH 3
2	1	119.000	29.045	None	0.00	0.00	0.00	0.0	179.80	2.86	183.20	15	Cir	0.012	0.55	193.10	MH 3 - MH 4
3	2	229.000	29.602	None	4.73	0.00	0.00	0.0	183.20	2.71	189.40	15	Cir	0.012	1.00	197.00	MH 4 - MH 5
4	3	69.000	0.587	DrGrt	0.00	0.23	0.50	6.9	189.40	1.30	190.30	15	Cir	0.012	1.50	196.80	MH 5 - YD 6
5	4	136.000	96.200	DrGrt	0.00	0.16	0.48	5.0	190.30	1.10	191.80	15	Cir	0.012	0.50	197.90	YD 6 - YD 7
6	5	106.000	-5.408	DrGrt	0.00	6.29	0.25	19.6	191.80	1.04	192.90	15	Cir	0.012	1.00	196.70	YD 7 - YD 8
7	3	135.000	90.890	DrGrt	0.00	0.05	0.58	5.0	189.40	1.04	190.80	15	Cir	0.013	0.50	195.00	MH 5 - AD 9
8	7	38.000	1.761	DrGrt	0.00	0.04	0.60	5.0	190.80	1.05	191.20	15	Cir	0.013	1.00	195.00	AD9 - AD 10

Project File: System 200-02.stm

Number of lines: 8

Date: 3/14/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	79.000	0.00	6.77	0.00	0.00	1.82	0.0	21.0	4.3	12.51	11.67	10.26	15	2.78	177.60	179.80	178.82	181.02	177.00	187.00	MH 2 - MH 3
2	1	119.000	0.00	6.77	0.00	0.00	1.82	0.0	20.8	4.3	12.56	11.82	10.29	15	2.86	179.80	183.20	181.02	184.42	187.00	193.10	MH 3 - MH 4
3	2	229.000	0.00	6.77	0.00	0.00	1.82	0.0	20.5	4.4	12.64	11.51	10.30	15	2.71	183.20	189.40	184.45	191.93	193.10	197.00	MH 4 - MH 5
4	3	69.000	0.23	6.68	0.50	0.12	1.76	6.9	20.3	4.4	7.72	7.99	6.30	15	1.30	189.40	190.30	193.58	194.42	197.00	196.80	MH 5 - YD 6
5	4	136.000	0.16	6.45	0.48	0.08	1.65	5.0	19.9	4.4	7.30	7.35	5.95	15	1.10	190.30	191.80	195.35	196.83	196.80	197.90	YD 6 - YD 7
6	5	106.000	6.29	6.29	0.25	1.57	1.57	19.6	19.6	4.5	7.03	7.13	5.73	15	1.04	191.80	192.90	197.11	198.18	197.90	196.70	YD 7 - YD 8
7	3	135.000	0.05	0.09	0.58	0.03	0.05	5.0	8.6	7.1	0.37	6.58	0.31	15	1.04	189.40	190.80	193.58	193.59	197.00	195.00	MH 5 - AD 9
8	7	38.000	0.04	0.04	0.60	0.02	0.02	5.0	5.0	9.0	0.22	6.63	0.18	15	1.05	190.80	191.20	193.59	193.59	195.00	195.00	AD9 - AD 10

Project File: System 200-02.stm

Number of lines: 8

Run Date: 3/14/2022

NOTES:Intensity = 43.36 / (Inlet time + 3.80) ^ 0.72; Return period =Yrs. 25 ; c = cir e = ellip b = box

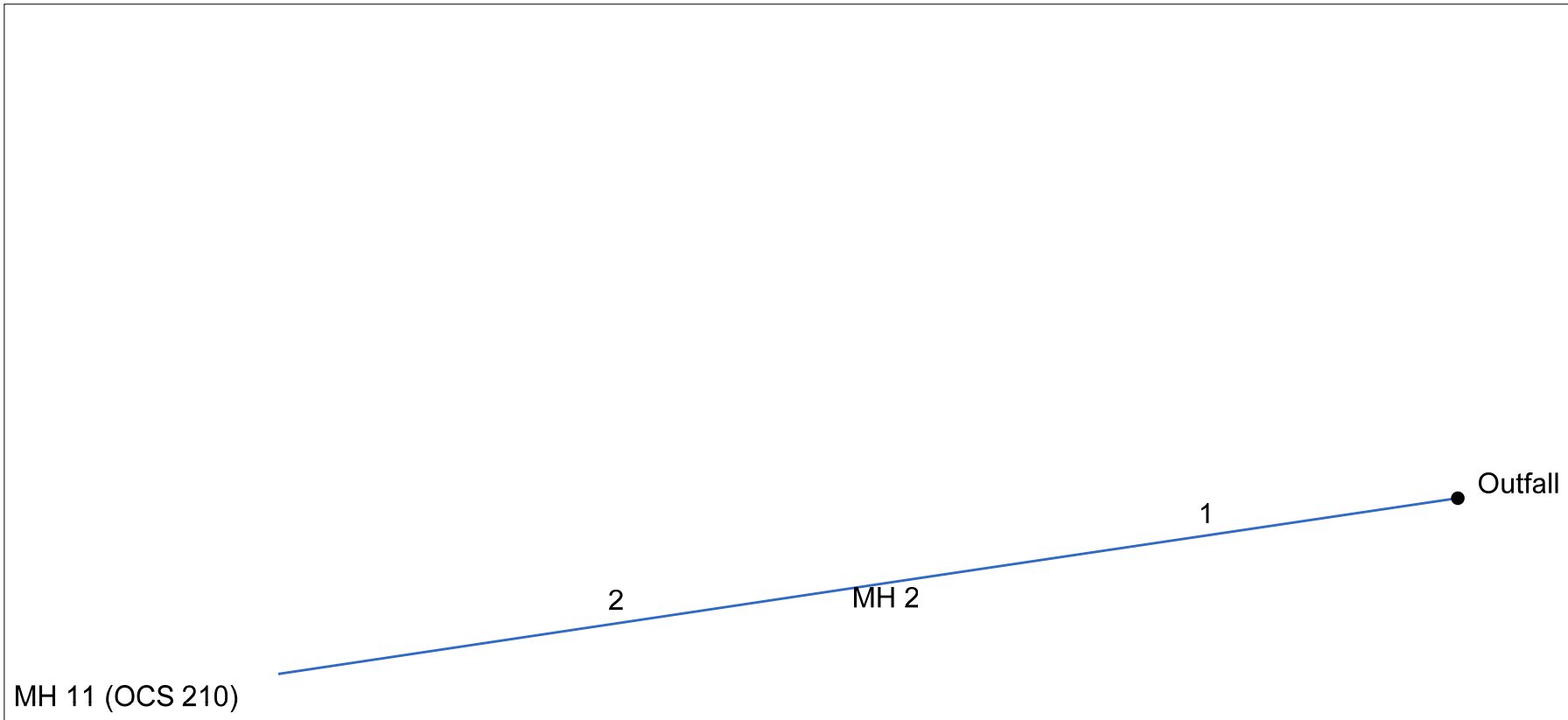
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	15	12.51	177.60	178.82	1.22	1.22	10.26	1.64	180.46	0.000	79.000	179.80	181.02	1.22**	1.22	10.26	1.64	182.66	0.000	0.000	n/a	0.54	n/a
2	15	12.56	179.80	181.02	1.22	1.22	10.29	1.65	182.67	0.000	119.000	183.20	184.42	1.22**	1.22	10.29	1.65	186.07	0.000	0.000	n/a	0.55	0.91
3	15	12.64	183.20	184.45	1.25*	1.23	10.30	1.65	186.10	3.268	229.000	189.40	191.93	1.25	1.23	10.30	1.65	193.58	3.267	3.267	7.482	1.00	1.65
4	15	7.72	189.40	193.58	1.25	1.23	6.30	0.62	194.20	1.220	69.000	190.30	194.42	1.25	1.23	6.29	0.62	195.04	1.219	1.220	0.841	1.50	0.92
5	15	7.30	190.30	195.35	1.25	1.23	5.95	0.55	195.90	1.091	136.000	191.80	196.83	1.25	1.23	5.95	0.55	197.38	1.090	1.091	1.483	0.50	0.28
6	15	7.03	191.80	197.11	1.25	1.23	5.73	0.51	197.62	1.010	106.000	192.90	198.18	1.25	1.23	5.73	0.51	198.69	1.010	1.010	1.071	1.00	0.51
7	15	0.37	189.40	193.58	1.25	1.23	0.31	0.00	193.58	0.003	135.000	190.80	193.59	1.25	1.23	0.31	0.00	193.59	0.003	0.003	0.005	0.50	0.00
8	15	0.22	190.80	193.59	1.25	1.23	0.18	0.00	193.59	0.001	38.000	191.20	193.59	1.25	1.23	0.18	0.00	193.59	0.001	0.001	0.000	1.00	0.00

Project File: System 200-02.stm | Number of lines: 8 | Run Date: 3/14/2022

Notes: * depth assumed; ** Critical depth. ; c = cir e = ellip b = box

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: Outlet 210-02.stm	Number of lines: 2	Date: 3/14/2022

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	27.000	171.342	None	14.64	0.00	0.00	0.0	176.60	3.70	177.60	15	Cir	0.012	0.15	183.70	MH 1 - MH 2
2	1	35.000	0.000	None	2.80	0.00	0.00	0.0	177.60	0.57	177.80	15	Cir	0.012	1.00	189.30	MH 2 - MH 11 (OCS

Project File: Outlet 210-02.stm

Number of lines: 2

Date: 3/14/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	27.000	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	17.44	13.46	14.21	15	3.70	176.60	177.60	177.85	179.53	182.80	183.70	MH 1 - MH 2
2	1	35.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.80	5.29	2.28	15	0.57	177.60	177.80	180.00	180.06	183.70	189.30	MH 2 - MH 11 (O

Project File: Outlet 210-02.stm | Number of lines: 2 | Run Date: 3/14/2022

NOTES:Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period =Yrs. 100 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	15	17.44	176.60	177.85	1.25	1.23	14.21	3.14	180.99	6.218	27.000	177.60	179.53	1.25**	1.23	14.21	3.14	182.67	6.215	6.217	1.678	0.15	0.47
2	15	2.80	177.60	180.00	1.25	1.23	2.28	0.08	180.08	0.160	35.000	177.80	180.06	1.25	1.23	2.28	0.08	180.14	0.160	0.160	0.056	1.00	0.08

Project File: Outlet 210-02.stm | Number of lines: 2 | Run Date: 3/14/2022

Notes: ; ** Critical depth. ; c = cir e = ellip b = box