
STORMWATER MANAGEMENT NARRATIVE

PREPARED FOR:

**Gym, Stage, and Science Addition and Alterations
Minnetonka Middle School
Minnetonka Public Schools District 276
6421 Hazeltine Blvd
Excelsior, MN 55331**

~~February 13, 2026~~
~~Revised February 27, 2026~~
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Stormwater Summary

The Minnetonka Middle School West Gym, Stage, and Science Addition Project in Excelsior, MN is located at 6421 Hazeltine Blvd. This project consists of replacing an existing grass sports field with a synthetic turf field, relocating the existing running track, and constructing a new gym and science addition.

A HydroCAD stormwater model is being developed to estimate peak runoff rates and volumes for the existing and proposed drainage conditions. The SCS Curve Number Method was used with rainfall distribution of a Type II 24-hour storm. The hydrographs were based on the updated NOAA Atlas 14 data for the area. This rainfall data is shown in Appendix A. Curve Numbers were determined from the National Resource Conservation Service (NRCS) Web Soil Survey, a topographic survey from Civil Site Group Project Number 23189.02, dated October 11, 2025, aerial images, and the Geotechnical Evaluation Report from Braun Intertec Project Number B2508902, dated January 27, 2026.

Existing Conditions

The existing project site consists of a ~130,000 SF school and supporting parking facilities along with recreational facilities. It also includes a grass sports field surrounded by a running track and other track and field components. The draft Geotechnical Evaluation Report by Braun Intertec indicated that the native soils at this site consist of alluvially deposited clay loam and organic soils.

According to the survey from Civil Site Group Surveying, the site drains to 6 separate subcatchments. Four of the subcatchments drain to onsite BMP's (Subcatchments 1-4), and 2 drain offsite untreated (5&6). A 7th Subcatchment in the NW portion of the site drains overland and is conveyed by City storm drain at Hazeltine Blvd. See Figure 1 for Map.

The site is located in Minnehaha Creek Watershed District (MCWD) and therefore follows the MCWD permitting regulations. The majority of the site drains to ditch on Hazeltine Blvd which discharges to a pond south of Lake Lucy Road.

Subcatchment 1S- This area is in the southwest corner of the site and consists of the south portion of the school and parking lot. This area is primarily impervious (160,800 SF of the total 242,000 SF) and drains to a pretreatment basin and wet basin (1P) that was constructed in 2011 as part of the water tower improvements.

Subcatchment 2S- This area is in the central portion of the site and consists of the north portion of the parking lot. This area is primarily impervious (169,600 SF of the total 250,600 SF) and drains to wet basin (2P) via storm drains.

Subcatchment 3S- This small area is in the central east portion of the site and consists of an active play area. The area is 97% pervious and drains to a low area (3P) that is captured by storm drain and is conveyed to pond 2P.

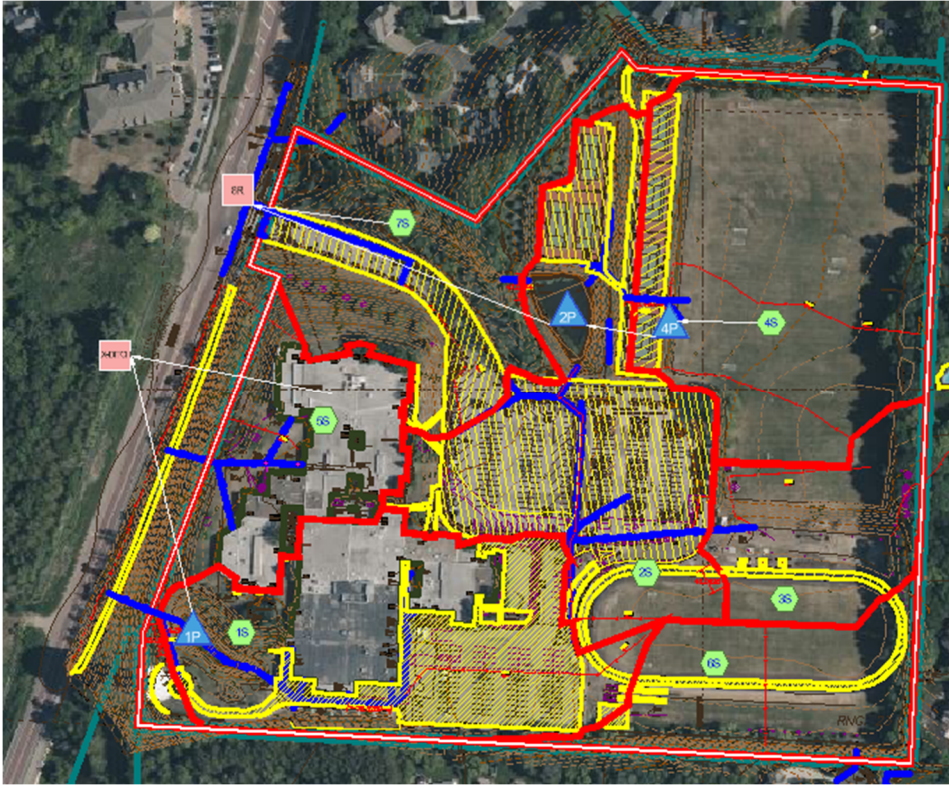
Subcatchment 4S- This area is the largest of the 7 and accounts for 23% of the property. This area is in the northeast part of the site and consists of an active grass play area and 4 tennis courts. The area is 92% pervious and drains to a low area/ditch (4P). 4P can be considered as pretreatment before discharge via storm drain to pond 2P.

Subcatchment 5S- This area is on the west side of the site and consists of the north portion of the school (74,000 SF of roof runoff). This roof runoff is collected in downspouts and consolidated in a single pipe and conveyed to the bottom of the slope into a ditch in the ROW.

Subcatchment 6S- This Subcatchment represents another small area (122,000 SF) is in the southeast corner of the site and consists of the grass soccer field and a portion of the track. The area is 93% pervious and drains untreated south off site down a slope.

Subcatchment 7S- This area is in the northwest portion the site and consists steep driveway (< 5.0%) and adjacent grassed/wooded hills (20%) that drain to it. The runoff is captured by storm drain in the driveway and is conveyed in public storm drains off-site (8R).

Figure 1: Existing Hydro Boundaries and Designations (NTS)



Note that Existing Subcatchment 1S – 4S account for 67% of the site area and drain to existing BMP's.

Proposed Conditions

The proposed site modifications consist of replacing the grass sports field and the running track with a new synthetic turf field and the running track. This is designated on both the Existing and Proposed Drainage Maps as Subcatchment 6S. This will change the hydrologic boundary in the SE corner of the site closer to the jurisdictional boundary line due to the new sports field drainage now being directed west. Also, a part of the improvements are 2 new building additions and associated parking.

Included in the improvements is reconstruction of existing pavement in order to construct utilities and traffic connectivity to accommodate the new building addition. Water quality treatment calculations are provided for total of new and reconstructed impervious. The same pavement section for new construction will be used for the reconstruction condition. Some of the modified impervious that is already being treated by existing BMP's (1P & 2P) has been excluded from the area to treated due to topographical constraints which is described in each watershed description.

Routing of the proposed runoff to one of the three final destinations was also considered (Ditch, 6S, & 8R). Storm drains were added according to not increasing the rate for these three destinations.

Subcatchment 1S- The modified existing 1S is reduced by 32,100 SF (242,000 SF – 209,900 SF). 15,800 SF of untreated pavement (160,800 SF-145,000 SF) has been removed from this Subcatchment. This is due to the new improvements and the routing of drainage to the proposed BMP (P-3B). To construct the new building addition along with a new fire service and stormwater outfall from P-3B, 21,500 SF of pavement will be disturbed and repaved. Due to the reduction in area and impervious and the treatment provided in 1P, **treatment for this modified pavement has been removed from the required treatment calculation.**

Basin 1P – This basin was constructed in 2011. No new impervious is routed directly to 1P. It is surrounded by trees, the water tower, and the water tower access road. No modifications are proposed to basin 1P due to its recent construction, its topographical constraints, and that the untreated impervious in the watershed has been reduced by 14%.

Subcatchment 2S- The modified existing 2S is reduced by 36,800 SF (250,600 SF – 213,800 SF) and impervious by 10,000 SF (169,600 SF – 159,600 SF) see Table 1. This is due to the new improvements and the routing of drainage to the proposed BMP (P-3B). 2S still drains to and is treated in Basin 2P. To construct the site, 20,600 SF of pavement will be removed and replaced to blend into the new building and driveways. This modified pavement drains to existing storm drains to 2P. It was determined that modifying the storm drain with 2S to drain to 3B-P was infeasible due to the topography.

Subcatchment 3A-S / 3B-S - The majority of the modified 3S has been spilt into 2 areas. The existing 3S which previously drained to 3P then to Basin 2P, now drains to 2 new BMP's.

Basin 2P –

- This is an existing wet basin that 2S, 3S, and 4S drains to in the existing condition.
- In the proposed condition, only 2S & 4S drain to 2P and 3S has been rerouted to new BMP's.
- The area draining to 2P has reduced by 148,300 SF ~22% by land area
- Impervious area to 2P has been reduced by 22,100 SF.
- This reduced area has been routed to new BMP's (3A-P & 3B-P).
- 2P is surrounded by steep slopes (25 to 45%) and trees along with a chain link fence to keep students out
- Due to the topographical constraints of 2P and reduction of area draining to 2P (22% reduction in land area). Volume reduction in the basin's discharge mimics the area reduction (~20%). Therefore, a request to not provide any additional treatment for the 20,600 SF of modified pavement routed to 2P.

Table 1: Area Summary of Subcatchments to 2P

EXISTING	TOTAL AREA (SF)	IMPERVIOUS AREA (SF)	PROPOSED	TOTAL AREA (SF)	IMPERVIOUS AREA (SF)	TOTAL CHANGE (SF)	IMPERVIOUS CHANGE (SF)
2S	250,600	169,600	2S	213,800	159,600	(36,800)	(10,000)
3S	104,000	3,800				(104,000)	(3,800)
4S	306,500	24,200	4S	299,000	15,900	(7,500)	(8,300)
TOTAL	661,100	197,600	TOTAL	512,800	175,500	(148,300)	(22,100)

Table 2: Hydrocad Summary of 2P

Rate Summary - 2P					Volume Summary - 2P				
	Existing	Proposed	Diff	Diff		Existing	Proposed	Diff	Diff
Storm Event	[cfs]	[cfs]	[cfs]	%	Storm Event	[af]	[af]	[af]	%
2-Year	8.28	7.03	-1.25	-15.1	2-Year	1.25	1.01	-0.24	-19.2
10-Year	20.49	18.66	-1.83	-8.9	10-Year	2.75	2.21	-0.54	-19.8
100-Year	43.51	39.19	-4.32	-9.9	100-Year	6.37	5.08	-1.30	-20.4

Subcatchment 4S- The modified 4S is relatively unchanged by a land area perspective and is reduced by 7,500 SF (306,500 SF – 299,000 SF). This is due to the new improvements and the routing of drainage to the proposed BMP's (P-3A).

Subcatchment 5S- The existing 5S which drained off site untreated is reduced in the proposed condition by 8,400 SF (132,700 SF - 113,600 SF) see Table 1. This is due to the new improvement and the routing of drainage to the proposed BMP's (P-3A).

Subcatchment 5A-S- This new watershed is a portion of the original 5S. This Subcatchment incorporates the new building addition and a new treatment basin (5A-P)

Subcatchment 6S- This Subcatchment in the southern corner drains south off the site down a slope untreated. The area was greatly reduced to 49,500 from 122,000 SF (see Table 1). The balance now drains west to new BMP's (3A-P & 3B-P).

Subcatchment 7S- This area is in the northwest portion of the site and consists steep driveway (< 5.0%) and adjacent grassed/wooded hills (20%) that drain to it. This area is relatively unchanged from the existing condition.

Pond 3A-P is an underground filtration system under the sports field. The system has a series of Drintile and has been developed to treat runoff.

Ponds 3B-F & 3B-P is a forebay and filter basin that will treat roof and parking runoff.

Pond 5A-P is above ground filtration systems that will treat roof and pavement runoff. An effort to maximize impervious runoff to this BMP was made. Current piping configuration of existing roof drains prohibited routing existing roof runoff to 5A-P. Also, the building on the east side and the slope on the west of the basin constrict the size of the basin.

Figure 2: Proposed Hydro Boundaries and Designations (NTS)

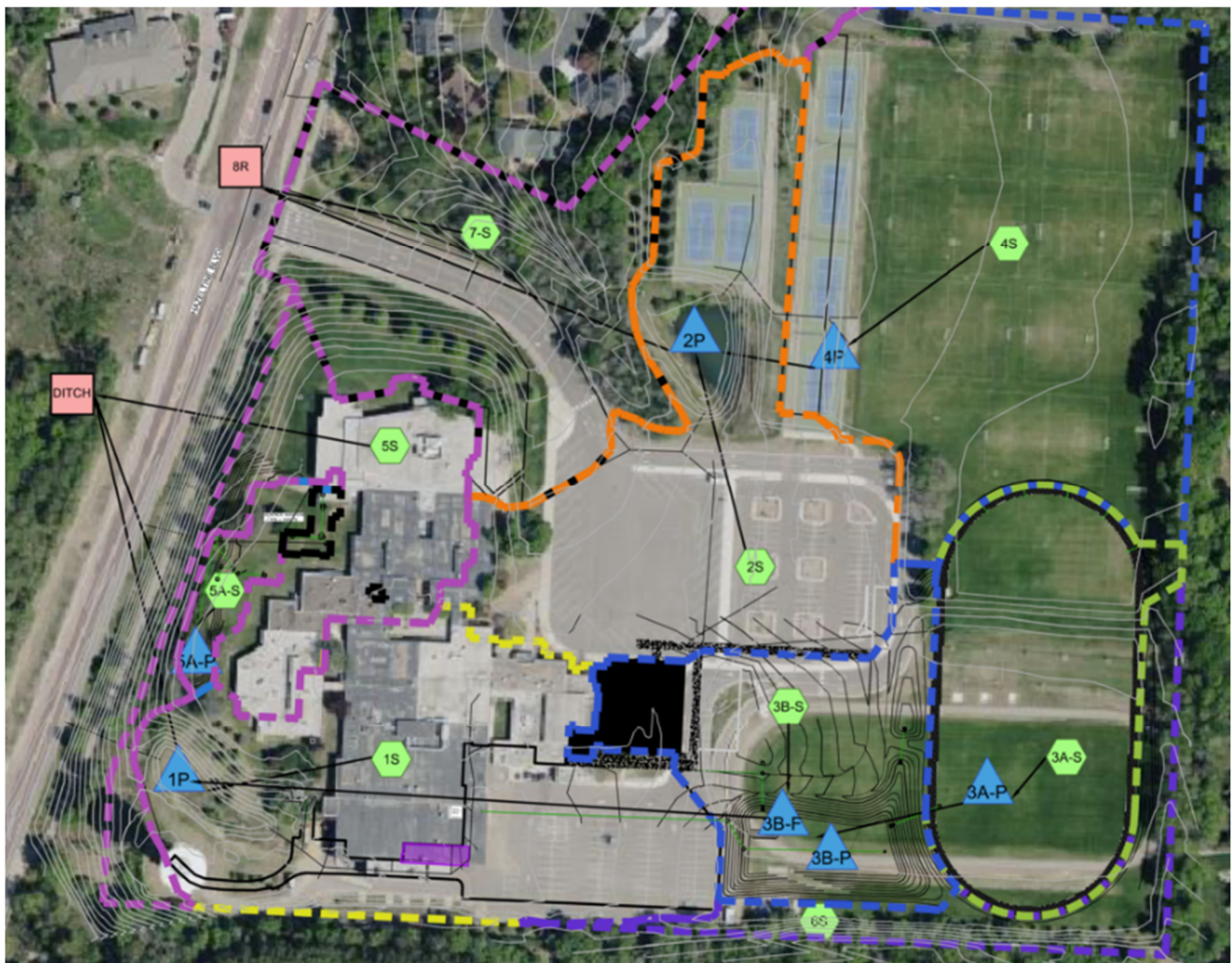


Table 3: Subcatchment Area Summaries

	TOTAL AREA (SF)	TOTAL AREA (AC)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (AC)	PERVIOUS AREA (SF)	PERVIOUS AREA (AC)
1S	242,000	5.56	160,800	3.69	81,200	1.86
2S	250,600	5.75	169,600	3.89	81,000	1.86
3S	104,000	2.39	3,800	0.09	100,200	2.30
4S	306,500	7.04	24,200	0.56	282,300	6.48
5S	132,700	3.05	74,000	1.70	58,700	1.35
6S	122,000	2.80	8,400	0.19	113,600	2.61
7S	181,500	4.17	44,000	1.01	137,500	3.16
TOTAL	1,339,300	30.75	484,800	11.13	854,500	19.62

1S	209,900	4.82	145,000	3.33	64,900	1.49
2S	213,800	4.91	159,600	3.66	54,200	1.24
3aS	138,800	3.19	135,500	3.11	3,300	0.08
3bS	114,400	2.63	35,800	0.82	78,600	1.80
4S	299,000	6.86	15,900	0.37	283,100	6.50
5S	113,600	2.61	74,900	1.72	38,700	0.89
5A-S	19,000	0.44	8,300	0.19	10,700	0.25
6S	49,500	1.14	-	-	49,500	1.14
7S	181,300	4.16	40,800	0.94	140,500	3.23
TOTAL	1,339,300	30.75	615,800	14.14	723,500	16.61

CHANGE	131,000	3.01	-131,000	(3.01)
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RECONSTRUCTED PAVEMENT	84,100	1.93
RECONSTRUCTED PAVEMENT TO 1P	-21,500	-0.49
RECONSTRUCTED PAVEMENT TO 2P	-20,600	-0.47
TOTAL PAVEMENT ELIDGIBLE FOR WATER QUALITY TREATMENT	173,000	3.97

Stormwater Objectives

Based on the site size, the disturbance and the amount of increased impervious surface, the Minnehaha Creek Watershed District requires phosphorus control, rate control, and volume control for the additional impervious surface. With the site being predominantly D soil, filtration will be considered versus infiltration. For filtration, the required volume is for 2” of runoff (calculation for 2” treatment in Appendix B). Total Phosphorus (at least 60%), Total Suspended Solids (at least 90%) , and rate control will be provided using filtration.

The size of the site is 30.7 acres, with 7.7 acres of existing impervious surfaces (7.4 acres of buildings and pavements, 0.3 acres of water). Approximately 8.2 acres will be disturbed on the site, which is less than 40% of the site (8.2/30.7=27%). There will be an increase of approximately 2.9 acres of impervious surface with the synthetic turf, new addition and parking improvements, the total of which is less than a 50% increase in impervious surface. Water quality treatment calculations are provided for 4.94 acres of new and reconstructed impervious. An Exhibit demonstrating the areas can be found in Appendix B.

For the treatment under the field, the aggregates and sand are modeled as having 30% voids. Providing a minimum of 3ft of sand for filtration beneath the synthetic turf, there will be 80,640 cf of filtration provided. The volume requirement is obtained in the first foot on the sand.

The volume control requirement in the synthetic turf area will require 8,000 cf of abstraction. Fifty percent of the filtration volume equates to an abstraction volume credit of 40,320 cf, which is higher than the requirement.

Filtration Basin #3B-P provides the required storage for the ~70,500 SF of impervious that is routed to it.

Hydrocad calculations summaries are provided Table 5 and demonstrate that flow rate is reduced in the 2,10, and 100 yr storm events to all 3 points of discharge. Filtration calculations are shown in Table 6. Note the modified pavement in 1S and 2S are removed as they are previously accounted for in the treatment train and discussed earlier in this report. The full Hydrocad calculations are provided in a separate document.

Table 4: Rainfall Analysis Data

Rainfall Data	
Storm Event	Rainfall (in)
2-Year	2.84
10-Year	4.20
100-Year	7.18

Table 5: Hydrocad Summaries

Rate Summary - Ditch				
	Existing	Proposed	Diff	Diff
Storm Event	[cfs]	[cfs]	[cfs]	%
2-Year	11.60	10.56	-1.04	-9.0
10-Year	19.16	15.71	-3.45	-18.0
100-Year	35.85	33.53	-2.32	-6.5

Volume Summary - Ditch				
	Existing	Proposed	Diff	Diff
Storm Event	[af]	[af]	[af]	%
2-Year	1.35	1.68	0.33	24.8
10-Year	2.29	3.17	0.88	38.3
100-Year	4.46	6.70	2.24	50.3

Rate Summary - 6S (To South)				
	Existing	Proposed	Diff	Diff
Storm Event	[cfs]	[cfs]	[cfs]	%
2-Year	2.54	1.23	-1.31	-51.6
10-Year	5.11	2.52	-2.59	-50.7
100-Year	11.29	5.65	-5.64	-50.0

Volume Summary - 6S (To South)				
	Existing	Proposed	Diff	Diff
Storm Event	[af]	[af]	[af]	%
2-Year	0.27	0.10	-0.16	-61.4
10-Year	0.53	0.21	-0.32	-61.0
100-Year	1.17	0.46	-0.71	-60.3

Rate Summary - 8R (To City Storm)				
	Existing	Proposed	Diff	Diff
Storm Event	[cfs]	[cfs]	[cfs]	%
2-Year	9.23	7.94	-1.29	-14.0
10-Year	24.73	23.61	-1.12	-4.5
100-Year	52.13	49.40	-2.73	-5.2

Volume Summary - 8R (To City Storm)				
	Existing	Proposed	Diff	Diff
Storm Event	[af]	[af]	[af]	%
2-Year	1.67	1.41	-0.26	-15.3
10-Year	3.56	2.99	-0.57	-16.1
100-Year	8.15	6.79	-1.36	-16.7

Rate Summary - Total Site				
	Existing	Proposed	Diff	Diff %
Storm Event	[cfs]	[cfs]	[cfs]	%
2-Year	23.37	19.73	-3.64	-15.6
10-Year	49.00	41.84	-7.16	-14.6
100-Year	99.27	88.58	-10.69	-10.8

Volume Summary - Total Site				
	Existing	Proposed	Diff	Diff %
Storm Event	[af]	[af]	[af]	%
2-Year	3.28	3.20	-0.09	-2.6
10-Year	6.38	6.37	-0.01	-0.2
100-Year	13.78	13.96	0.18	1.3

Table 6: Filtration Calculations (Required / Provided)

NEW OR MODIFIED PAVEMENT	215,100	SF or	4.94	AC
MODIFIED IMPRV TO 1S TO 1P	(21,500)			
MODIFIED IMPRV TO 2S TO 2P	(20,600)			
TOTAL IMPRV TO TREAT	173,000	SF or	3.97	AC
REQUIRED FILTRATION VOLUME, PROVIDE 2" TREATMENT VOLUME				
173,000 SF X 2 IN / (12 IN / FT) =	28,833	CF		

IMPERVIOUS AREA DRAINING TO NEW BMP'S

FILTRATION BASIN (3B-P)	35,800	SF
TRACK AND FIELD FILTRATION (3A-P)	135,500	SF
BUILDING ADDITION FILTRATION (7P)	10,733	SF
TOTAL IMPERV AREA TREATED	182,033	SF , Exceeds Required

WQ Storage

FILTRATION BASIN (3B-P)	14,406
TRACK AND FIELD FILTRATION (3A-P)	26,880 * 1st foot of storage
BUILDING ADDITION FILTRATION (7P)	2,008
WATER QUALITY PROVIDED	43,294 CF , Exceeds Required

Table 7: Basin Water Quality Volumes

FILTRATION BASIN (3B-P)

IMPERVIOUS TREATED BY 3B-P			
NEW OR MODIFIED PAVEMENT	16,539	SF or	0.38 AC
BUILDING 1	14,061	SF or	0.32 AC
SPORT COURT	5,200	SF or	0.12 AC
TOTAL IMPERVIOUS	35,800	SF or	0.82 AC

REQUIRED FILTRATION VOLUME, PROVIDE 2" TREATMENT VOLUME			
35,800	SF X 2 IN / (12 IN / FT) =	5,967	CF

FILTRATION 3B-P			
CONTOUR	AREA	VOLUME	
		STAGE	CUM'TIVE
	SF	CF	CF
1,047.90	10,800		-
1,048.00	10,940	1,087	1,087
1,049.00	12,980	11,960	13,047
1,049.10	14,200	1,359	14,406

BOTTOM OF BASIN

OUTLET ELEVATION

TRACK AND FIELD FILTRATION (3A-P)

IMPERVIOUS TREATED BY 3A-P			
SYNTHETIC FIELD and TRACK	128,300	SF or	2.95 AC
FIELD EQUIPMENT	7,200	SF or	0.17 AC
TOTAL IMPERVIOUS	135,500	SF or	3.11 AC

REQUIRED FILTRATION VOLUME, PROVIDE 2" TREATMENT VOLUME			
135,500	SF X 2 IN / (12 IN / FT) =	22,583	CF

FILTRATION 3A-P				
CONTOUR	AREA	VOLUME		
		STAGE	VOIDS	CUM'TIVE
	SF	CF	%	CF
1,057.12	89,600			-
1,058.12	89,600	89,600	30%	26,880
1,059.12	89,600	89,600	30%	53,760
1,060.12	89,600	89,600	30%	80,640

BUILDING ADDITION FILTRATION (7P)

IMPERVIOUS TREATED BY 7P			
NEW SIDEWALK	2,433	SF or	0.06 AC
NEW BUILDING 2	8,300	SF or	0.19 AC
TOTAL IMPERVIOUS	10,733	SF or	0.25 AC

REQUIRED FILTRATION VOLUME, PROVIDE 2" TREATMENT VOLUME			
10,733	SF X 2 IN / (12 IN / FT) =	1,789	CF

FILTRATION 7P			
CONTOUR	AREA	VOLUME	
		STAGE	CUM'TIVE
	SF	CF	CF
1,050.50	2,875		-
1,051.00	3,665	1,635	1,635
1,051.10	3,800	373	2,008

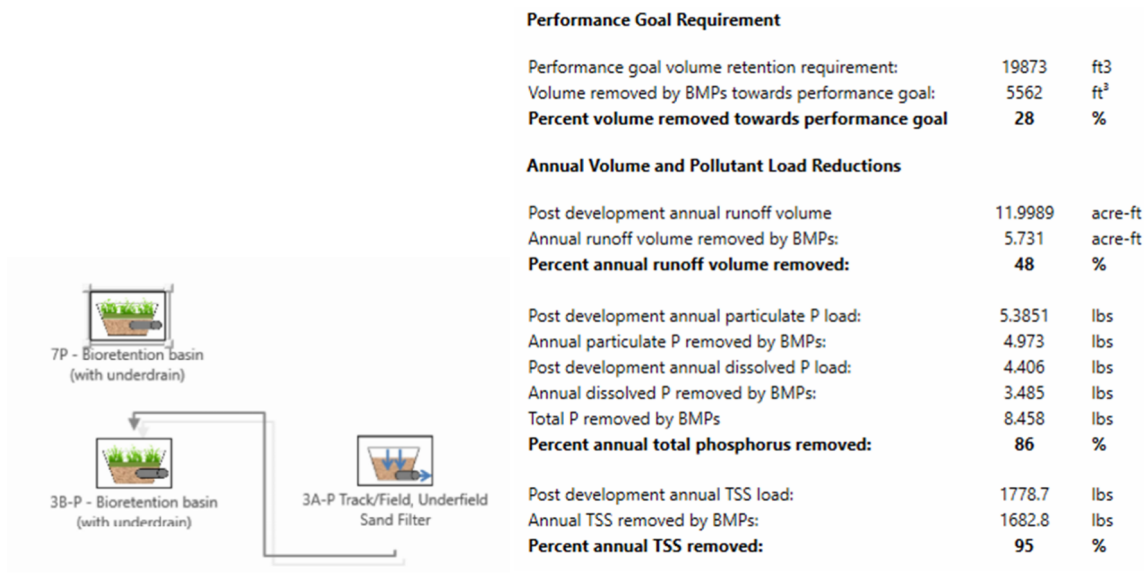
BOTTOM OF BASIN

OUTLET ELEVATION

MIDS

A MIDS model was completed to determine TP and TSS removal for the 3 new BMP's. Assuming that all of the new and disturbed ground is routed to the new BMP's, the TSS removal is 95% and TP is 86%. The undisturbed ground that is currently routed to existing BMP's was ignored for this calculation. The MIDS summary can be found in Figure 5.

Figure 3: MIDS Summary



Erosion and Sediment Control

Temporary Control -A construction exit will be installed. Seeding will be used on disturbed areas to prevent erosion, and to allow permanent stabilization of the grassy areas in the future. Inlet protection will be used at all inlets to prevent sediment from entering into the storm sewers. Temporary soil stockpiles will have silt fence or other effective sediment controls, and will not be placed in surface waters, including storm water conveyances such as conduits and ditches. Stockpiles that remain on the site for more than 7 days shall be seeded, mulched, and surrounded by silt fence.

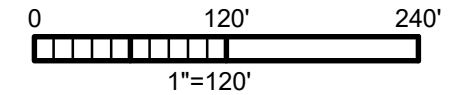
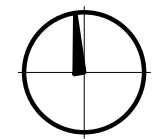
Permanent Control – Natural turf will be established for complete stabilization on all disturbed pervious areas outside of the track and field. Synthetic turf will be placed over the aggregates within the track.



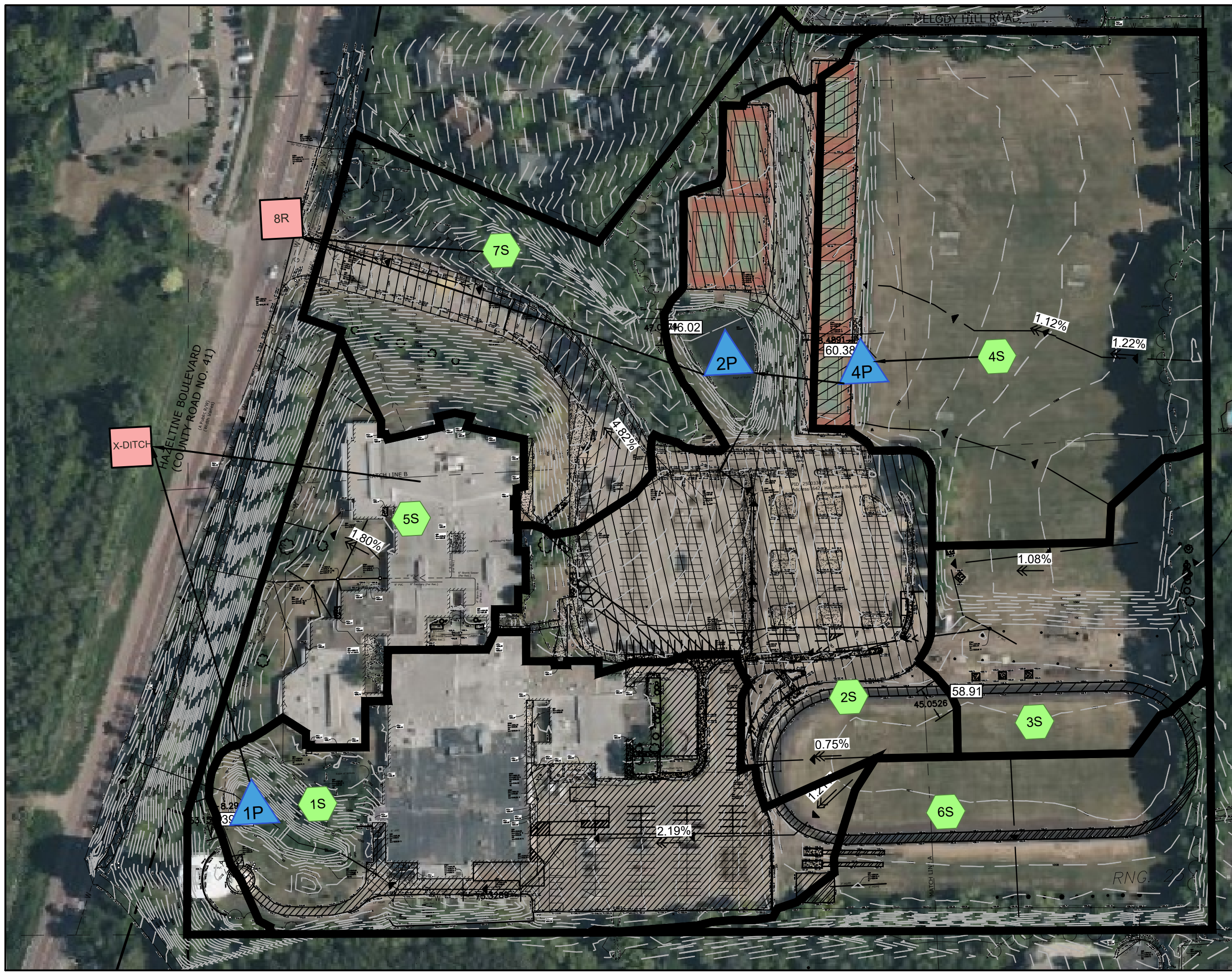
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NORTH



	TOTAL AREA (SF)	TOTAL AREA (AC)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (AC)	PERVIOUS AREA (SF)	PERVIOUS AREA (AC)
1S	242,000	5.56	160,800	3.69	81,200	1.86
2S	250,600	5.75	169,600	3.89	81,000	1.86
3S	104,000	2.39	3,800	0.09	100,200	2.30
4S	306,500	7.04	24,200	0.56	282,300	6.48
5S	132,700	3.05	74,000	1.70	58,700	1.35
6S	122,000	2.80	8,400	0.19	113,600	2.61
7S	181,500	4.17	44,000	1.01	137,500	3.16
TOTAL	1,339,300	30.75	484,800	11.13	854,500	19.62

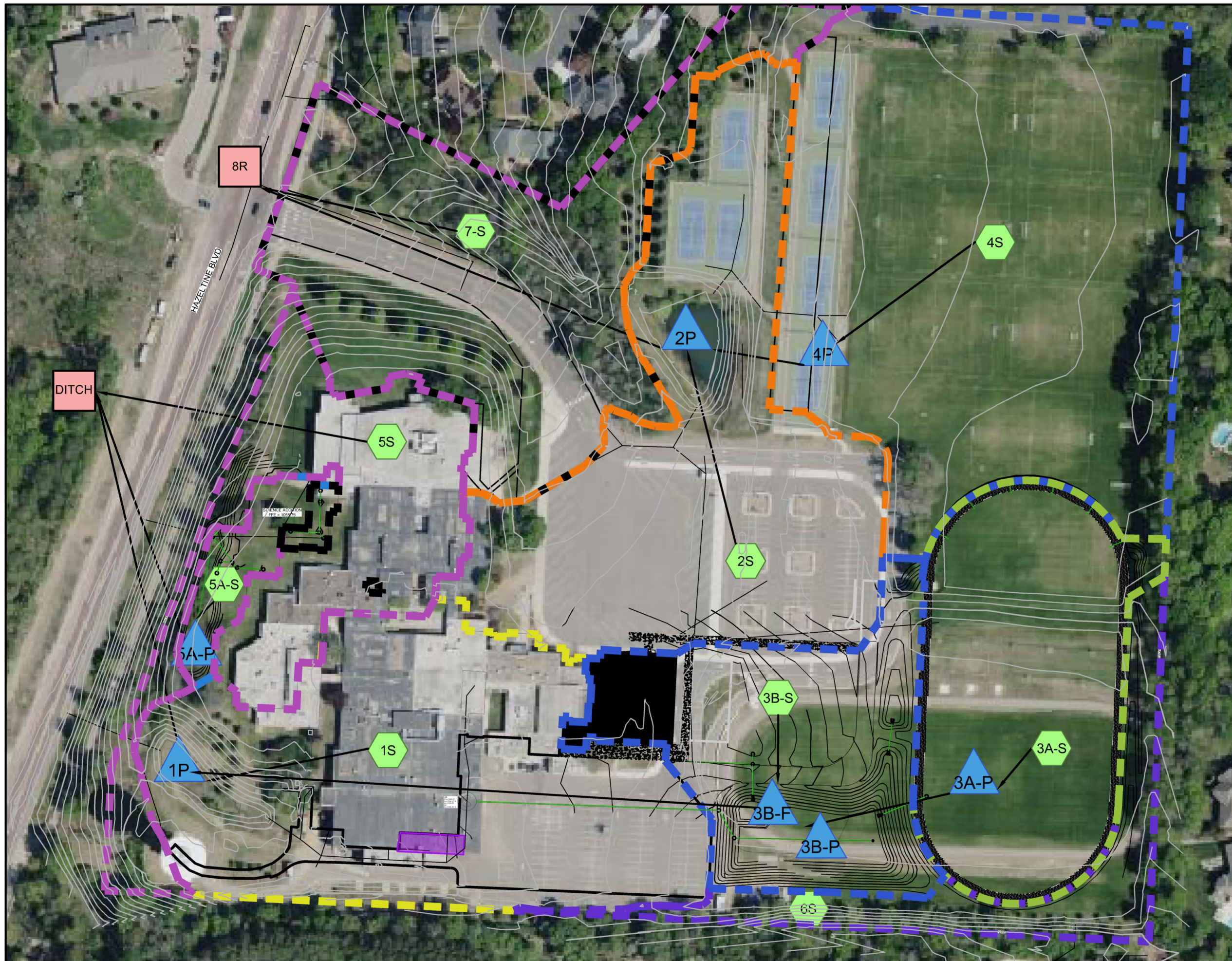
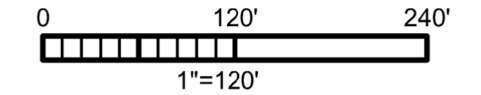


EX HYDRO



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	TOTAL AREA (SF)	TOTAL AREA (AC)	IMPERVIOUS AREA (SF)	IMPERVIOUS AREA (AC)	PERVIOUS AREA (SF)	PERVIOUS AREA (AC)
1S	209,900	4.82	145,000	3.33	64,900	1.49
2S	213,800	4.91	159,600	3.66	54,200	1.24
3aS	138,800	3.19	135,500	3.11	3,300	0.08
3bS	114,400	2.63	35,800	0.82	78,600	1.80
4S	299,000	6.86	15,900	0.37	283,100	6.50
5S	113,600	2.61	74,900	1.72	38,700	0.89
5A-S	19,000	0.44	8,300	0.19	10,700	0.25
6S	49,500	1.14	-	-	49,500	1.14
7S	181,300	4.16	40,800	0.94	140,500	3.23
TOTAL	1,339,300	30.75	615,800	14.14	723,500	16.61

PROP HYDRO