APPROVED

STORMWATER MAINTENANCE AGREEMENT

Massillon CSD – West Side Elementary School

City of Massillon, Stark County, Ohio

This Inspection and Maintenance Agreement, made this _____ day of _____ 20__, by and between the ***Massillon City School District*** (hereafter referred to as the Owner) and the ***City of Massillon*** hereafter referred to as the Community, provides as follows:

WHEREAS, the Owner is responsible for certain real estate shown as Tax Map No. ***681180*** that is to be developed as ***West Side Elementary School*** and referred to as the Property**;** and,

WHEREAS, the Owner is providing a stormwater management system consisting of the following stormwater control measures (SCMs): ***cast iron stormwater grates, and frames, catch basins, storm sewers, 100 Year flow paths, stormwater management basin and features as set forth in the approved plans*** as shown and described on the attached Comprehensive Stormwater Management Plan in Exhibit A and Storm Water Volume Calculation in Exhibit B; and,

WHEREAS, to comply with Section **920.10** of the Codified Ordinances of the ***City of Massillon*** Comprehensive Stormwater Management, pertaining to this project, the Owner has agreed to inspect, maintain, and repair the SCMs in accordance with the terms and conditions hereinafter set forth.

NOW, THEREFORE, for and in consideration of the mutual covenants and undertaking of the parties, the parties hereby agree as follows:

A. FINAL INSPECTION APPROVAL

The Owner shall certify in writing to the ***City of Massillon*** within 30 days of completion of the SCMs that the SCMs are constructed in accordance with the approved plans and specifications and per the approved Comprehensive Stormwater Management Plan. The Owner shall further provide an As-Built Certification, including As-Built Survey and Inspection, as described in **920.10**, a copy of this complete Inspection and Maintenance Agreement, and the approved Inspection and Maintenance Plan.

B. MAINTENANCE PLANS FOR STORMWATER CONTROL MEASURES

1. The Owner agrees to maintain in perpetuity the SCMs in accordance with approved Maintenance Plans described in #2 below and in a manner that will permit the SCMs to perform the purposes for which they were designed and constructed, and in accordance with the standards by which they were designed and constructed, all as shown and described in the approved Comprehensive Stormwater Management Plan. This includes all pipes and channels built to convey stormwater to the SCMs, as well as structures, improvements, and vegetation provided to control the quantity and quality of the stormwater.

2. The Owner shall provide a Maintenance Plan for each SCM. The Maintenance Plans shall include the following:

i. The location of each SCM and identification of the drainage areas served by each SCM.

ii. Photographs of each SCM, including all inlets and outlets upon completion of construction.

iii. A schedule of inspection.

iv. A schedule for regular maintenance for each aspect of the SCM and description of routine and non-routine maintenance tasks to ensure continued performance of the SCM as is detailed in the approved Comprehensive Stormwater Management Plan. The Owner shall also provide a maintenance inspection checklist written so the average person can understand it shall be incorporated. The maintenance plan will include a detailed drawing of each SCM and outlet structures with the parts of the outlet structure labeled. This schedule may include additional standards, as required by the ***City of Massillon*** engineer, to ensure continued performance of SCMs permitted to be located in, or within 50 feet of, water resources.

v. Location and documentation of all access and maintenance easements on the Property.

Alteration or termination of these stipulations is prohibited. The Owner must provide a draft Inspection and Maintenance Plan as part of the Comprehensive Stormwater Management Plan submittal. Once a draft is approved, a recorded copy of the Plan must be submitted to the ***City of Massillon*** to receive final inspection approval of the site, as noted above in Section A.

Note: Inspection and Maintenance Plans for all SCMs shall be drawn up to comply with the latest edition of the Ohio Department of Natural Resources Division of Soil and Water Conservation "Rainwater and Land Development Manual."

3. The Owner shall maintain, update, and store the maintenance records for the SCMs.

4. The Owner shall perform all maintenance in accordance with the Inspection and Maintenance Plan and shall complete all repairs identified through regular inspections, and any additional repairs as requested in writing by the ***City of Massillon***.

C. INSPECTION, MAINTENANCE AND REPAIR OF SCMs

1. The Owner shall inspect all SCMs listed in this Agreement, every three (3) months and after major storm events for the first year of operation.

2. The Owner shall inspect all SCMs listed in this Agreement at least once every year thereafter.

3. The Owner shall submit Inspection Reports in writing to the ***City of Massillon*** engineer within 30 days after each inspection. The reports shall include the following:

Date of inspection: _____

Name of inspector: _____
The condition and/or presence of:

(i) Stormwater management pond
(ii) Outlet structure

4. The Owner grants permission to the ***City of Massillon*** to enter the Property with prior notification to the Owner to inspect all aspects of the SCMs and related drainage whenever the ***City of Massillon*** deems necessary to verify that the SCMs are being maintained and operated in accordance with the terms and conditions hereinafter set forth. The ***City of Massillon*** shall maintain public records of the results of site inspections and shall provide the Owner copies of the inspection findings and shall indicate in writing any corrective actions and repairs to bring the SCMs into proper working condition if necessary.

5. The Owner shall complete all corrective actions and repairs within five (5) working days of their discovery through Owner inspections or through a request from the ***City of Massillon.*** If repairs will not occur within this five (5) day period, the Owner must receive written approval from the ***City of Massillon*** engineer for a repair schedule.

6. In the event of any default or failure by the Owner in the performance of any of the covenants and warranties pertaining to the maintenance of the SCMs, or the Owner fails to maintain the SCMs in accordance with the approved design standards and Inspection and Maintenance Plan, or, in the event of an emergency as determined by the ***City of Massillon,*** it is the sole discretion of the ***City of Massillon***, after providing reasonable notice to the Owner, to enter the property and take whatever steps necessary to correct deficiencies and to charge the cost of such repairs to the Owner. The Owner shall reimburse the ***City of Massillon*** upon demand, within ten (10) days of receipt thereof for all actual cost incurred by the ***City of Massillon,*** or more with written approval from the ***City of Massillon*** engineer. All costs expended by the ***City of Massillon*** in performing such necessary maintenance or repairs shall constitute a lien against the properties of the Owner. Nothing herein shall obligate the ***City of Massillon*** to maintain the SCMs.

D. FUNDING

The Owner shall specify the method of funding for the perpetual inspection, operation, and maintenance of the SCMs listed in this Inspection and Maintenance Agreement. A description of the funding mechanism shall be submitted to the ***City of Massillon*** and approved by the ***City of Massillon.***

E. INDEMNIFICATION

1. The Owner hereby agrees that it shall save, hold harmless, and indemnify the ***City of Massillon*** and its employees and officers from and against all liability, losses, claims, demands, costs and expenses arising from, or out of, default or failure by the Owner to maintain the SCMs, in accordance with the terms and conditions set forth herein, or from acts of the Owner arising from, or out of, the construction, operation, repair or maintenance of the SCMs.

2. The Owner hereby releases the ***City of Massillon*** from all damages, accidents, casualties, occurrences, or claims that might arise or be asserted against the ***City of Massillon*** from the presence, existence, or maintenance of the SCMs.

3. The parties hereto expressly do not intend by execution of this Inspection and Maintenance Agreement to create in the public, or any member thereof, any rights as a third party beneficiary or to authorize anyone not a party hereof to maintain a suit for any damages pursuant to the terms of this Inspection and Maintenance Agreement.

4. This Inspection and Maintenance Agreement shall be a covenant that runs with the land and shall inure to the benefit of and shall be binding upon the parties hereto, their respective successors and assigns, and all subsequent owners of the property.

5. The current Owner shall promptly notify the ***City of Massillon*** when the Owner legally transfers any of the Owners responsibilities for the SCMs. The Owner shall supply the ***City of Massillon*** with a copy of any document of transfer, executed by both parties.

6. Upon execution of this Inspection and Maintenance Agreement, it shall be recorded in the Recorder's Office of ***Stark County***, Ohio, at the Owner's expense.

IN WITNESS WHEREOF, the Owner has caused this Inspection and Maintenance Agreement to be signed in its names by a duly authorized person.

_____
Owner (signature)

_____
Owner (please print)

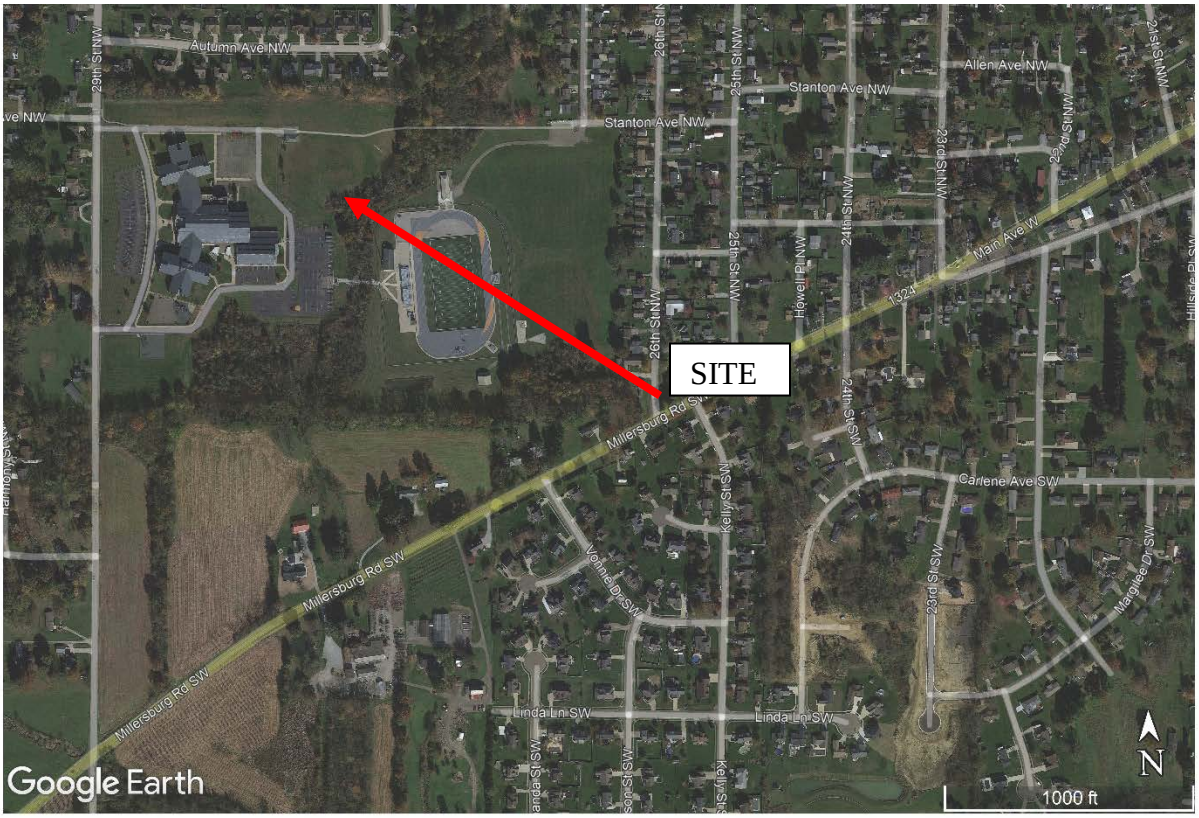
By: _____
Appropriate Community Official

Exhibit A

LONG TERM MAINTENANE PLAN FOR POST CONSTRUCTION STORMWATER QUALITY BEST MANAGEMENT PRACTICES WEST SIDE ELEMENTARY SCHOOL 250 29TH STREET NW

STORMWATER MANAGEMENT MEASURES

CITY OF MASSILLON, OHIO



Massillon City School District
930 17th Street NE
Massillon, Ohio 44646
Contact: Mark Fortner
mfortner@massillonschools.org
(330) 830 - 3900 ext. 50125

Project Description

The Massillon West Side Elementary School (hereinafter referred to as development) is a new elementary school building on the existing Intermediate & Junior High School site, located at 250 29th Street NW, within the City of Massillon.

There is one proposed extended wet detention storm water management structure in the development. The proposed pond will be located south of the proposed school, and shall provide water quality treatment through extended wet extended detention (24-hour draw down) in accordance with the Ohio EPA General Construction Permit OHC000005. The owner will be responsible or the general maintenance of these systems as directed in this document.

OPERATIONS AND MAINTENANCE MANUAL
WEST SIDE ELEMENTARY SCHOOL
STORMWATER MANAGEMENT MEASURES

Contact Information

1. Name: Massillon City School District
   c/o Mark FOrtner
2. Address: 930 17TH Street NE
   Massillon, Ohio 44646
3. Phone: 330-830-3900 Ext. 50125
4. E-mail: mfortner@massillonschools.org

Statement of Responsibility

1. The responsible party as named above, and/or any subsequent owner(s) of the property, is responsible for all maintenance and costs associated with the storm water management system.

Maintenance

1. Sediment Removal Procedure

Detention Basin Outlet Structure and Catch Basins

a. Remove lid.
b. Remove sediment from catch basin using shovel and other hand measures, or other mechanical measures as necessary.
c. Clean sediment from outlet riser and unclog orifices.
e. Replace the manhole lid.
g. Sediment and pollutants removed from the insert shall be hauled off site and disposed of in accordance with local, state, and federal regulations.

Detention Basins

a. Install silt fence around outlet structure.
b. Remove vegetative brush, saplings, and trees.
c. Remove sediment build-up using mechanical measures as necessary.
d. Re-grade water quality basin according to the detention basin plan found in the construction documents.
e. Seed, fertilize, and mulch all disturbed areas.
f. Remove silt fence from around outlet structure once vegetation is in basin is established.
g. Sediment and pollutants removed from the basin shall be hauled off site and

disposed of in accordance with local, state, and federal regulations

2. Maintenance Schedule
    a. Storm Water Management Measures Inspection – The storm water management measures should be inspected monthly for the first year and quarterly throughout the year after that and after major storm events.
    b. Detention Basin Outlet Structure Sediment Removal – The sediment and pollutants captured in the outlet structure shall be removed when the depth of sediment reaches to within 4" of the bottom of the water quality orifice and/or a minimum of once a year.

Water Quality Maintenance Schedule		
Water Quality Measure	Maintenance Activity	Schedule
Detention Basin Outlet Structure	Inspection of Detention Basin Outlet Structure	- Monthly for the first year - Quarterly after first year - After each rain event of greater than 0.5"
	Clean out Sediment and Pollutants	- When sediment depth has reached the bottom of the water quality orifice - Minimum of once a year
Catch Basin & Manhole Sumps	An inspection of catch basin sumps	- Every 2 months for the first 6 months, yearly after first year.
	Clean and remove debris and sediment	- as needed

3. Performance of Maintenance
    a. The inspection and maintenance of the storm water quality measures should be performed by a company with prior experience in similar work, and who owns equipment capable of performing the required procedures. The owner shall execute a contract with a company to perform such duties, as necessary, and shall provide them with a copy of the operations and maintenance manual.

Notes

1. The owner and any contractors hired to perform maintenance duties are responsible for meeting all federal, state, and local laws and regulations during the maintenance and cleanout operations of the storm water management measures.
2. The owner and any contractors hired to perform maintenance duties are responsible for complying with all federal, state, and local regulations when disposing of material collected from the storm water management measures. Water and sediment from cleanout procedures should not be dumped into sanitary sewer.
3. All inspection reports shall be submitted to the City of Massillon Engineer's Office and Stark County Soil & Water Conservation District for their records.

LONG TERM MAINTENANCE PLAN
FOR POST CONSTRUCTION STORM WATER QUALITY BEST MANAGEMENT PRACTICES (BMP'S)

Project Name: Massillon West Side Elementary School
Project Location: 250 29th Street NE, Massillon, Ohio 44646

Jurisdiction of Water Quality Practice Discharge point: (who's MS4 system does the WQ practice discharge into): Unnamed tributary to the Tuscarawas River

Massillon CSD c/o Mark Fortner shall be responsible for the long-term maintenance of the water quality practice(s) listed below.
They shall follow this plan and any other requirements of the Stark County Post Construction Storm Water Quality Ordinance, the City of Massillon Ordinances & OEPA to the maximum extent practicable. All inspection reports will be kept by current owners and submitted annually to the City of Massillon Engineer's Office and Stark County Soil & Water Conservation District. Inspection reports must also be submitted upon request from either to the City of Massillon Engineer's Office or Stark County Soil & Water Conservation District.

Water Quality Practice(s) on this site:

1. Extended Wet Detention Basin

Primary contact information for responsible person/entity:

Name of Post Construction Maintenance Contact: Mark Fortner

Contact Phone Number: 330-830-3900 Ext. 50125

I verify that I have read and understand the long term maintenance responsibilities as listed in this report.

Owner/Responsible Party signature: _____

Date: _____

Inspections

Sample Storm-Water Management Inspection/Maintenance Report

Storm-Water Management Inspection/Maintenance Report

Project Name: Massillon West Side Elementary School
Project Location: Latitude: 40°47'10.2"N , Longitude: 81°33'40.1"W
Address: 250 29th Street NW
City/Municipality: Massillon

Contact Name: Mark Fortner
Address 930 17th Street NE, Massillon, Ohio 44646
Phone 330-830-3900 Ext. 50125
E-mail mfortner@massillonschools.org

Date	Item Inspected	Inspected by	Observations	Actions Taken

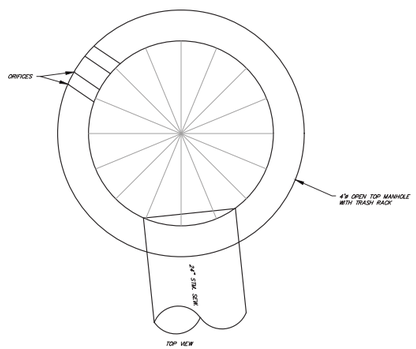
Exhibit B

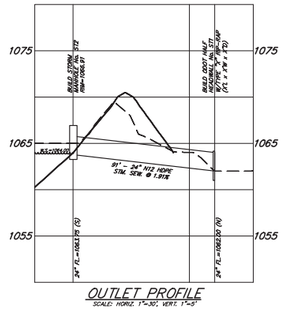
STORMWATER MANAGEMENT BASIN SUMMARY					
STORM EVENT (YEAR)	PRE- DEVELOPED RUN-OFF RATES (C.F.S.)	PST- DEVELOPED RUN-OFF RATES (C.F.S.)	ALLOWABLE RUN-OFF RATES (C.F.S.)	DETENTION BASIN DISCHARGE RATES (C.F.S.)	PEAK STORAGE ELEVATION (FT.)
1	6.47	30.97	6.47	1.38	1065.93
2	11.33	40.38	6.47	2.68	1066.35
5	19.78	54.71	6.47	4.19	1067.05
10	27.68	67.20	6.47	5.11	1067.69
25	40.98	85.85	6.47	6.22	1068.65
50	52.85	101.99	52.85	17.72	1069.09
100	66.23	118.40	66.23	37.56	1069.50

THE CRITICAL STORM WAS CALCULATED TO BE THE 25-YEAR STORM

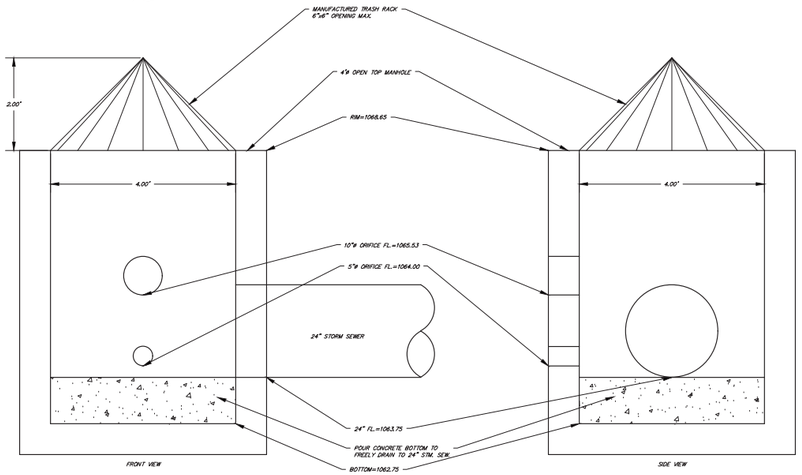
WQV REQUIRED BELOW PERMANENT WATER SURFACE = 50,481.57 CUBIC FEET
(INCLUDES 20% FOR SEDIMENT STORAGE)
WQV PROVIDED BELOW PERMANENT WATER SURFACE = 81,373 CUBIC FEET

WQV REQUIRED ABOVE PERMANENT WATER SURFACE = 42,051.31 CUBIC FEET
WQV PROVIDED ABOVE PERMANENT WATER SURFACE = 42,165.43 CUBIC FEET





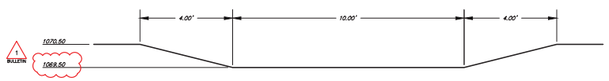
OUTLET PROFILE
SCALE: HORIZ. 1"=30', VERT. 1"=3'



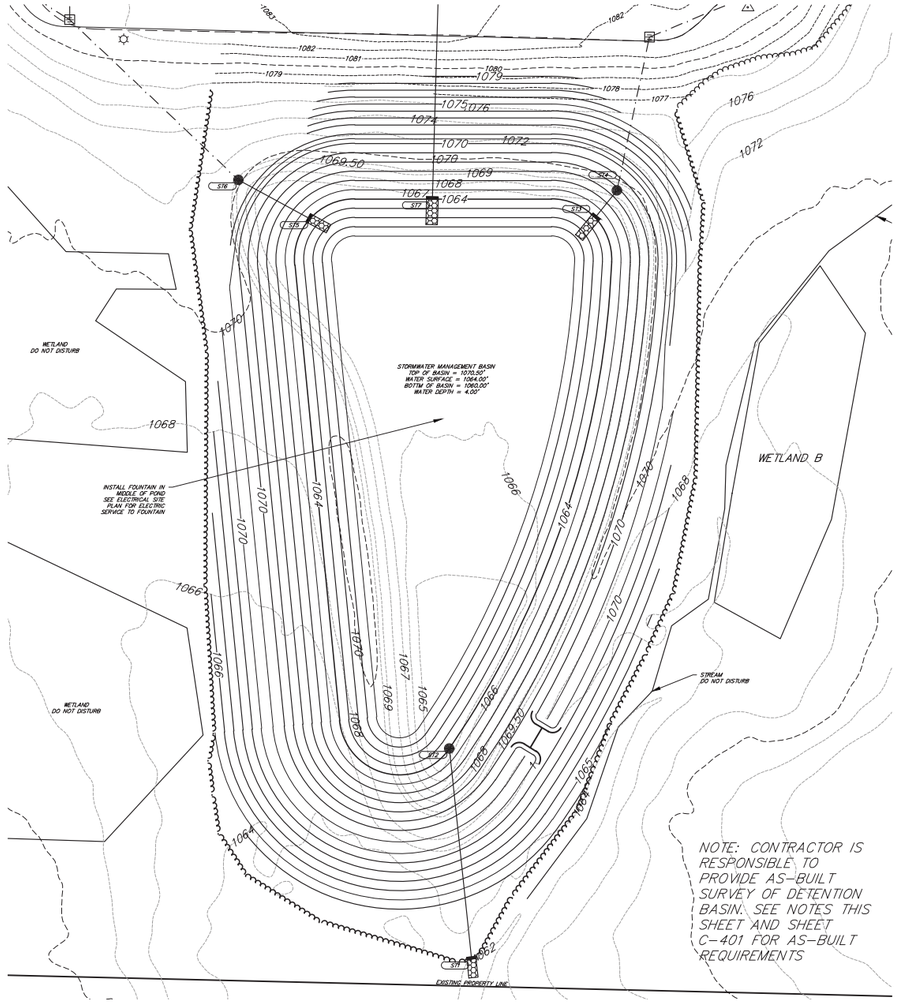
OUTLET STRUCTURE "ST2" DETAIL
SCALE: HORIZ. 1"=2', VERT. 1"=2'

NOTE:
CONTRACTOR SHALL INSTALL FLOATING FOUNTAIN SYSTEM IN MIDDLE OF BASIN FOR WATER QUALITY CONTROL. SEE ELECTRICAL PLANS FOR POWER TO FOUNTAIN. FOUNTAIN SHALL BE OUTDOOR WATER SOLUTIONS ECO LINE ½ HP 115V FLOATING POND FOUNTAIN, OR APPROVED EQUAL. CONTRACTOR SHALL PROVIDE ALL ITEMS, INCLUDING ANCHOR, INSTALLED.
FOUNTAIN SPRAY SHALL PROVIDE GREATER THAN 50% SURFACE AREA OF THE POND. CONTRACTOR SHALL UPGRADE FOUNTAIN, OR PROVIDE MULTIPLE FOUNTAINS TO MEET INTENDED COVERAGE.

NOTE: THIS STORMWATER MANAGEMENT BASIN IS A WET EXTENDED DETENTION BASIN



EMERGENCY OVERFLOW WEIR
SCALE: HORIZ. 1"=2', VERT. 1"=2'



STORMWATER MANAGEMENT PLAN
SCALE: 1"=20'

STORMWATER MANAGEMENT BASIN NOTES

1) THE FINAL STORMWATER MANAGEMENT BASIN SHALL NOT BE INSTALLED UNTIL THE END OF THE PROJECT. SEE SHEET C-700 FOR DIRECTION ON USING THE STORMWATER MANAGEMENT BASIN AS A SEDIMENT BASIN WHILE THE SITE IS UNDER CONSTRUCTION.

2) THE CONTRACTOR SHALL INSTALL THE STORMWATER MANAGEMENT BASIN AS SHOWN ON THIS PLAN AT THE END OF THE PROJECT.

3) THE CONTRACTOR SHALL COMPLETELY DEWATER THE SEDIMENT BASIN PRIOR TO BEGINNING ANY REGRADING ANY PARTS OF THE SEDIMENT BASIN TO ACHIEVE THE FINAL PLAN ELEVATIONS OF THE STORMWATER MANAGEMENT BASIN.

4) THE CONTRACTOR IS RESPONSIBLE FOR ALL EXPENSES TO CONVERT THE SEDIMENT BASIN TO THE FINAL STORMWATER MANAGEMENT BASIN, AS SHOWN ON THIS PLAN, INCLUDING BUT NOT LIMITED TO, REGRADING OF THE STORMWATER MANAGEMENT BASIN, MODIFICATION OF THE OUTLET STRUCTURE, CLEANING OF THE OUTLET STRUCTURE AND STM. STORM SEWERS.

5) AFTER THE CONSTRUCTION OF THE STORMWATER MANAGEMENT BASIN AND CONVERSION OF THE OUTLET STRUCTURE, THE CONTRACTOR SHALL PROVIDE AN ASBUILT SURVEY STAMPED BY AN OHIO REGISTERED PROFESSIONAL SURVEYOR, IN BOTH PAPER COPY AND ELECTRONIC AUTOCAD FILE, TO THE PROJECT ENGINEER, OF THE STORMWATER MANAGEMENT BASIN AREA AND OUTLET STRUCTURE FOR REVIEW AND ACCEPTANCE OF WORK.

6) DEVIATION FROM THE DESIGN ELEVATIONS AND LOCATIONS OF MORE THAN 1/8" VERTICALLY OR 1" HORIZONTALLY FOR THE OUTLET STRUCTURE, INCLUDING RIMS, FLOWLINES, ORIFICE AND OVERFLOW WEIRS, WILL NOT BE ACCEPTED.

7) DEVIATION OF 1% OR GREATER FROM THE DESIGN STORAGE VOLUME AT EACH CONTOUR ELEVATION WILL NOT BE ACCEPTED.

8) THE WATER QUALITY VOLUME MUST BE MET IN IT'S ENTIRETY IN ACCORDANCE WITH OHIO EPA GENERAL CONSTRUCTION PERMIT OHC000008.

9) THE STORMWATER MANAGEMENT BASIN SHALL NOT AT ANY TIME DISCHARGE STORM WATER AT A HIGHER RATE THAN ANY ALLOWABLE DISCHARGE RATE FOR EACH STORM EVENT.

9) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXPENSES TO HIRE A PROFESSIONAL SURVEYOR TO PERFORM AN ASBUILT SURVEY, AS WELL AS REGRADE THE BASIN TO THE DESIGN ELEVATIONS AND LOCATIONS AND ADJUST OR REPLACE THE OUTLET STRUCTURE UNTIL SAID ASBUILT DRAWINGS DEMONSTRATE THAT THE WORK IS COMPLETE AND ACCEPTABLE TO THE PROJECT ENGINEER.

10) AT THE END OF THE PROJECT, AFTER FINAL SITE STABILIZATION IS COMPLE (70+% VEGETATIVE COVER ESTABLISHED), THE CONTRACTOR SHALL SUBMIT VIDEO EVIDENCE OF ALL STORM SEWERS TO PROVE THE STORM SEWERS ARE CLEAR OF ANY SEDIMENTS, TRASH OR DEBRIS. EACH STORM RUN SHALL BE INSPECTED, IN ACCORDANCE WITH ODOT 611.12 REQUIREMENTS AND A PERFORMANCE REPORT SHALL BE SUBMITTED ALONG WITH THE VIDEO FILES FOR REVIEW IN ACCORDANCE WITH ODOT 611.04 D. IF ANY SEDIMENTS, TRASH OR DEBRIS IS PRESENT, THE CONTRACTOR SHALL CLEAN THE STORM SEWERS USING THE JET-VAC PROCESS RECOMMENDED BY THE MANUFACTURE AND RESUBMIT NEW VIDEO EVIDENCE AND PERFORMANCE REPORT OF THE STORM SEWERS, AT TO ADDITIONAL COST TO THE PROJECT.

12) IN THE EVENT THE CONTRACTOR FAILS TO PRODUCE ADEQUATE CLOSE OUT DOCUMENTS INCLUDING ASBUILTS AND VIDEO INSPECTION, THE DESIGN TEAM RESERVES THE RIGHT TO PERFORM AND/OR SUBCONTRACT THE REQUIRED SERVICES REQUIRED TO PRODUCE THE REQUIRED ASBUILT DOCUMENTS AND VIDEO INSPECTIONS. THE CONTRACTOR WILL THEN BE BACK CHARGED FOR THE COST PLUS TEN PERCENT (10%) THE FEES ASSOCIATED WITH ACQUIRING THE REQUIRED DOCUMENTS.

STORMWATER MANAGEMENT BASIN STORAGE (ABOVE PERMANENT POOL)	
ELEVATION (FEET)	VOLUME (CUBIC FEET)
1064	0
1065	29,628
1066	55,981
1067	84,160
1068	113,264
1069	167,394
1070	202,651
1070.50	224,869
STORMWATER MANAGEMENT BASIN STORAGE (PERMANENT POOL)	
ELEVATION (FEET)	VOLUME (CUBIC FEET)
1060	0
1061	16,733
1062	35,788
1063	57,269
1064	81,373

The "Basis of Bearings" for this survey is Grid North of the Ohio State Plane Coordinate System, NAD83(2011), North Zone as established by GPS Observations.

BENCHMARK #1:
EX. SAN. M.H. C
RIM = 1083.63

BENCHMARK #2:
EX. SAN. M.H. J
RIM = 1081.83

GRAPHIC SCALE
30 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

– PLAN PREPARED BY –
LEWIS LAND PROFESSIONALS INC.
CIVIL ENGINEERING LAND SURVEYING
8691 WADSWORTH ROAD SUITE 100
WADSWORTH, OH 44281 (330) 335-8232

OHIO811.org Before You Dig

22-071 - STORMWATER MANAGEMENT BASIN PLAN.DWG

PROJECT NO 2203-1

ARCHITECTURAL VISION GROUP, LTD
ARCHITECTS • PLANNERS
23850 SPERRY DRIVE CLEVELAND, OHIO 44145

PROFESSIONAL SEAL: I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. JOSEPH A. VITALE

CONSULTANT: LEWIS LAND PROFESSIONALS
8691 WADSWORTH ROAD SUITE 100
WADSWORTH, OH 44281
PH (330) 335-8232
FX (330) 335-8242
WWW.LANDPROINC.COM

MARK	DESCRIPTION	DATE
1	BULLETIN 1	05.23.23
2	ADDENDUM 1	06.14.23
3	PLAN REVISION #1	09.05.23
4	ESP	09.14.23

MASSILON CITY SCHOOL
WEST SIDE CAMPUS
250 29th St NW, Massillon, OH 44647

PROJECT NO 2203-1
DRAWN BY
CHECKED BY
DATE 09.14.2022

STORMWATER MANAGEMENT BASIN PLAN

SCALE: 1" = 20'

SHEET NO
C-701

Exhibit C

The water quality volume for this site is calculated in accordance with the Ohio EPA General Construction Permit OHC000005 dated April 23, 2018.

Calculate the run-off coefficient "R_v":
$R_v = 0.05+0.9i$

R_v =Coefficient
i=Imperviousness ratio=imperviousness acreage / total acreage=(13.11/21.36)=0.614

$R_v = 0.05+0.9(0.614)$
$R_v = 0.6026$

Calculate the required "Water Quality Pond Volume" (WQV):
$WQV = (R_v \times P \times A) / 12$

WQV = Volume in Acre-Feet
R_v = Run-Off Coefficient= 0.6026
P = Precipitation Depth = 0.9 Inches
A = Drainage Area = 21.36 Acres

WQV = (0.6026 x 0.9 x 21.36) / 12
WQV = 0.9653652 Acre-Feet
WQV = 42,051.31 Cubic Feet

Required volume below the water surface (elevation 1064.00).

(42,051.31 * 1.00) + (42,051.31 * 0.20) = 50,461.57 Cubic Feet

The pond volume table states the permanent water pool volume is approximately 81,273 Cubic Feet.

Required volume above the water surface.

42,051.31 * 1.00 = 42,051.31 Cubic Feet

Apply the storage volume (42,051.31 c.f.) to the pond. The resulting water elevation is 1065.53. Interpolating from the provided Elevation vs. Area table, you will determine that at elevation 1065.53, the pond storage volume is approximately 42,185.43 c.f. which is above the required volume.

Using the Drain Time Calculator in Pond Pack software to demonstrate that it takes at least 24 hours to drain the pond from elevation 1065.53 through a 5" diameter orifice. 24 hours is the minimum drain time for wet extended detention. Following is a print out of the Time vs. Volume table from the Drain Time Calculator starting at elevation 1065.53 showing 5,301 c.f. of water is retained in the basin at 24 hours (1440 minutes). The table shows it will take longer than 24 hours to drain the pond from elevation 1065.53.

In addition, the minimum drain time, 50% of the above pool volume must remain in the water quality basin for the first 8 hours (480 minutes). The Time vs. Volume table from the Drain Time Calculator starting at elevation 1065.53 demonstrates that 21,457 c.f. is remaining in the basin beyond the initial 8 hours.

References:

1.) O.E.P.A. N.P.D.E.S. for Discharge of Storm Water from Construction Sites. (Permit OHC000005 effective April 23, 2018)
2.) Rainwater and Land Development Manual for Ohio. Post-Construction Storm Water Treatment Section. Water Quality Ponds.

Type.... Time vs. Volume
Name.... MDRAIN 1 OUT

File.... E:\2022\22-00-09\22-07\22-071\d-calcs\22-071_DET.PPW

TIME vs. VOLUME (cu.ft)

Time min	Output Time increment = 5.00 min Time on left represents time for first value in each row.				
.00	41837	41582	41331	41084	40833
25.00	40582	40332	40085	39839	39593
50.00	39347	39104	38862	38620	38379
75.00	38137	37900	37658	37421	37180
100.00	36943	36710	36473	36240	36008
125.00	35775	35546	35314	35086	34857
150.00	34626	34397	34173	33946	33722
175.00	33498	33274	33051	32831	32611
200.00	32392	32172	31953	31738	31519
225.00	31303	31088	30877	30662	30451
250.00	30240	30029	29822	29611	29404
275.00	29198	28991	28784	28582	28375
300.00	28173	27974	27771	27572	27374
325.00	27175	26977	26782	26587	26389
350.00	26195	26001	25810	25616	25425
375.00	25238	25048	24861	24675	24488
400.00	24302	24119	23936	23754	23571
425.00	23389	23210	23028	22849	22674
450.00	22496	22321	22146	21971	21800
475.00	21629	21457	21287	21119	20948
500.00	20781	20614	20447	20280	20116
525.00	19953	19789	19629	19466	19307
550.00	19150	18991	18835	18678	18522
575.00	18370	18214	18062	17909	17757
600.00	17608	17460	17311	17162	17017
625.00	16872	16727	16582	16440	16299
650.00	16157	16019	15878	15740	15602
675.00	15468	15330	15196	15061	14927
700.00	14796	14665	14534	14404	14276
725.00	14149	14022	13898	13771	13647
750.00	13526	13403	13282	13162	13045
775.00	12925	12808	12691	12577	12464
800.00	12353	12243	12136	12029	11926
825.00	11822	11719	11618	11521	11424
850.00	11328	11234	11140	11047	10956
875.00	10866	10779	10692	10605	10521
900.00	10438	10357	10274	10193	10113
925.00	10036	9959	9881	9804	9731
950.00	9657	9583	9509	9439	9368
975.00	9301	9230	9163	9096	9029
1000.00	8965	8901	8837	8773	8712
1025.00	8648	8587	8530	8469	8411
1050.00	8354	8297	8239	8185	8127

480 min.
8 hrs.

Type.... Time vs. Volume
Name.... MDRAIN 1 OUT

File.... E:\2022\22-00-09\22-07\22-071\d-calcs\22-071_DET.PPW

TIME vs. VOLUME (cu.ft)

Time min	Output Time increment = 5.00 min Time on left represents time for first value in each row.				
1075.00	8073	8019	7968	7914	7863
1100.00	7812	7761	7713	7662	7611
1125.00	7563	7516	7468	7420	7372
1150.00	7328	7280	7236	7191	7147
1175.00	7102	7058	7016	6972	6931
1200.00	6889	6848	6807	6766	6724
1225.00	6686	6645	6607	6569	6528
1250.00	6493	6455	6417	6379	6344
1275.00	6309	6271	6236	6201	6167
1300.00	6132	6100	6065	6034	5999
1325.00	5967	5936	5904	5872	5841
1350.00	5809	5778	5749	5717	5689
1375.00	5657	5629	5601	5572	5544
1400.00	5515	5487	5462	5433	5408
1425.00	5380	5354	5326	5301	5275
1450.00	5250	5225	5200	5178	5152
1475.00	5127	5105	5080	5058	5033
1500.00	5011	4985	4963	4941	4916
1525.00	4894	4872	4850	4828	4806
1550.00	4784	4762	4740	4721	4699
1575.00	4677	4655	4636	4614	4595
1600.00	4573	4554	4532	4513	4494
1625.00	4475	4453	4435	4416	4397
1650.00	4378	4359	4340	4321	4303
1675.00	4284	4268	4249	4230	4211
1700.00	4196	4177	4161	4142	4127
1725.00	4108	4092	4073	4058	4042
1750.00	4023	4007	3992	3976	3960
1775.00	3945	3929	3913	3897	3882
1800.00	3866	3850	3835	3819	3803
1825.00	3791	3775	3759	3744	3731
1850.00	3716	3703	3687	3675	3659
1875.00	3647	3631	3618	3606	3590
1900.00	3578	3565	3553	3537	3524
1925.00	3512	3499	3487	3474	3462
1950.00	3449	3437	3424	3412	3399
1975.00	3387	3374	3362	3352	3340
2000.00	3327	3315	3305	3293	3283
2025.00	3271	3258	3249	3236	3227
2050.00	3214	3205	3193	3183	3171
2075.00	3161	3152	3139	3130	3121
2100.00	3111	3099	3089	3080	3071
2125.00	3061	3052	3039	3030	3021
2150.00	3011	3002	2992	2983	2974

1440 mins
24 hrs.

Type.... Time vs. Volume
Name.... MDRAIN 1 OUT

File.... E:\2022\22-00-09\22-07\22-071\d-calcs\22-071_DET.PPW

TIME vs. VOLUME (cu.ft)

Time min	Output Time increment = 5.00 min Time on left represents time for first value in each row.				
2175.00	2964	2955	2949	2939	2930
2200.00	2921	2911	2902	2896	2886
2225.00	2877	2867	2861	2852	2842
2250.00	2836	2827	2817	2811	2802
2275.00	2796	2786	2780	2771	2764
2300.00	2755	2749	2739	2733	2724
2325.00	2717	2711	2702	2696	2689
2350.00	2680	2674	2667	2658	2652
2375.00	2646	2639	2630	2624	2618
2400.00	2611	2605	2599	2593	2583
2425.00	2577	2571	2564	2558	2552
2450.00	2546	2540	2533	2527	2521
2475.00	2515	2508	2502	2496	2490
2500.00	2483	2477	2471	2465	2458
2525.00	2452	2446	2440	2437	2430
2550.00	2424	2418	2412	2405	2399
2575.00	2393	2387	2380	2374	2371
2600.00	2365	2359	2352	2346	2340
2625.00	2334	2327	2324	2318	2312
2650.00	2306	2299	2293	2290	2284
2675.00	2278	2271	2265	2262	2256
2700.00	2249	2243	2237	2234	2228
2725.00	2221	2215	2212	2206	2200
2750.00	2193	2190	2184	2178	2172
2775.00	2168	2162	2156	2153	2147
2800.00	2140	2134	2131	2125	2119
2825.00	2115	2109	2103	2100	2094
2850.00	2087	2084	2078	2072	2069
2875.00	2063	2056	2053	2047	2044
2900.00	2038	2031	2028	2022	2016
2925.00	2013	2006	2003	1997	1991
2950.00	1988	1982	1978	1972	1969
2975.00	1963	1957	1954	1947	1944
3000.00	1938	1935	1929	1926	1919
3025.00	1916	1910	1907	1901	1898
3050.00	1891	1888	1882	1879	1873
3075.00	1870	1863	1860	1854	1851
3100.00	1845	1842	1835	1832	1826
3125.00	1823	1817	1814	1810	1804
3150.00	1801	1795	1792	1786	1782
3175.00	1779	1773	1770	1764	1761
3200.00	1758	1751	1748	1742	1739
3225.00	1736	1730	1726	1720	1717
3250.00	1714	1708	1705	1702	1695

Type.... Time vs. Volume
Name.... MDRAIN 1 OUT

File.... E:\2022\22-00-09\22-07\22-071\d-calcs\22-071_DET.PPW

TIME vs. VOLUME (cu.ft)

Time min	Output Time increment = 5.00 min Time on left represents time for first value in each row.				
3275.00	1692	1689	1683	1680	1677
3300.00	1670	1667	1664	1658	1655
3325.00	1652	1646	1642	1639	1633
3350.00	1630	1627	1624	1618	1614
3375.00	1611	1605	1602	1599	1596
3400.00	1590	1586	1583	1580	1574
3425.00	1571	1568	1565	1558	1555
3450.00	1552	1549	1543	1540	1537
3475.00	1534	1527	1524	1521	1518
3500.00	1515	1509	1506	1503	1499
3525.00	1496	1490	1487	1484	1481
3550.00	1478	1475	1468	1465	1462
3575.00	1459	1456	1453	1447	1444
3600.00	1440	1437	1434	1431	1428
3625.00	1422	1419	1416	1412	1409
3650.00	1406	1403	1400	1394	1391
3675.00	1388	1385	1381	1378	1375
3700.00	1372	1369	1366	1360	1357
3725.00	1353	1350	1347	1344	1341
3750.00	1338	1335	1332	1329	1325
3775.00	1322	1319	1316	1310	1307
3800.00	1304	1301	1298	1294	1291
3825.00	1288	1285	1282	1279	1276
3850.00	1273	1270	1267	1263	1260
3875.00	1257	1254	1251	1248	1245
3900.00	1242	1239	1235	1232	1229
3925.00	1226	1223	1220	1217	1214
3950.00	1211	1208	1204	1201	1198
3975.00	1198	1195	1192	1189	1186
4000.00	1183	1180	1176	1173	1170
4025.00	1167	1164	1161	1158	1155
4050.00	1152	1152	1149	1145	1142
4075.00	1139	1136	1133	1130	1127
4100.00	1124	1124	1121	1118	1114
4125.00	1111	1108	1105	1102	1099
4150.00	1099	1096	1093	1090	1087
4175.00	1083	1080	1077	1077	1074
4200.00	1071	1068	1065	1062	1062
4225.00	1059	1055	1052	1049	1046
4250.00	1043	1043	1040	1037	1034
4275.00	1031	1031	1028	1024	1021
4300.00	1018	1015	1015	1012	1009
4325.00	1006	1003	1003	1000	997
4350.00	993	990	990	987	984

Type.... Time vs. Volume
Name.... MDRAIN 1 OUT

File.... E:\2022\22-00-09\22-07\22-071\d-calcs\22-071_DET.PPW

TIME vs. VOLUME (cu.ft)

Time min	Output Time increment = 5.00 min Time on left represents time for first value in each row.				
4375.00	981	981	978	975	972
4400.00	969	969	966	962	959
4425.00	959	956	953	950	950
4450.00	947	944	941	941	938
4475.00	935	931	931	928	925
4500.00	922	922	919	916	913
4525.00	913	910	907	904	904
4550.00	900	897	897	894	891
4575.00	888	888	885	882	882
4600.00	879	876	876	873	869
4625.00	866	866	863	860	860
4650.00	857	854	854	851	848
4675.00	848	845	842	842	838
4700.00	835	835	832	829	829
4725.00	826	823	823	820	817
4750.00	817	814	811	811	807
4775.00	804	804	801	801	798
4800.00	795	795	792	789	789
4825.00	786	786	783	780	780
4850.00	776	773	773	770	770
4875.00	767	764	764	761	761
4900.00	758	755	755	752	749
4925.00	749	745	745	742	742
4950.00	739	736	736	733	733
4975.00	730	727	727	724	724
5000.00	721	721	718	715	715
5025.00	711	711	708	708	705
5050.00	702	702	699	699	696
5075.00	696	693	693	690	687
5100.00	687	684	684	680	680
5125.00	677	677	674	674	671
5150.00	668	668	665	665	662
5175.00	662	659	659	656	656
5200.00	653	653	649	649	646
5225.00	646	643	643	640	640
5250.00	637	637	634	634	631
5275.00	631	628	628	625	625
5300.00	622	622	619	619	615
5325.00	615	612	612	609	609
5350.00	606	606	603	603	600
5375.00	600	597	597	594	594
5400.00	591	591	588	588	584
5425.00	584	584	581	581	578
5450.00	578	575	575	572	572

Type.... Time vs. Volume
Name.... MDRAIN 1 OUT

File.... E:\2022\22-00-09\22-07\22-071\d-calcs\22-071_DET.PPW

TIME vs. VOLUME (cu.ft)

Time min	Output Time increment = 5.00 min Time on left represents time for first value in each row.				
5475.00	569	569	569	566	566
5500.00	563	563	560	560	557
5525.00	557	553	553	553	550
5550.00	550	547	547	544	544
5575.00	544	541	541	538	538
5600.00	535	535	535	532	532
5625.00	529	529	526	526	526
5650.00	523	523	519	519	519
5675.00	516	516	513	513	510
5700.00	510	510	507	507	504
5725.00	504	504	501	501	498
5750.00	498	498	495	495	492
5775.00	492	492	488	488	485
5800.00	485	485	482	482	482
5825.00	479	479	476	476	476
5850.00	473	473	473	470	470
5875.00	467	467	467	464	464
5900.00	464	461	461	458	458
5925.00	458	454	454	454	451
5950.00	451	451	448	448	445
5975.00	445	445	442	442	442
6000.00	439	439	439	436	436
6025.00	436	433	433	433	430
6050.00	430	430	427	427	427
6075.00	424	424	420	420	420
6100.00	417	417	417	414	414
6125.00	414	411	411	411	411
6150.00	408	408	408	405	405
6175.00	405	402	402	402	399
6200.00	399	399	396	396	396
6225.00	393	393	393	389	389
6250.00	389	389	386	386	386
6275.00	383	383	383	380	380
6300.00	380	377	377	377	377
6325.00	374	374	374	371	371
6350.00	371	368	368	368	368
6375.00	365	365	365	362	