Leavitt & Starck Excavating, Inc.

16220 National Parkway
Lansing, MI 48906
Phone (517) 323-7630 Fax (517) 338-0767

July 31, 2023

Bath Charter Township
14480 Webster Road.
Bath, Mi. 48808

Attn: Ben Zeeb

Subject: Wiswasser park

Dear Ben,

We respectfully submit the following bid for your review on the above-mentioned project per plans and specs. Our quote includes the following:

1) Mobilization.
2) SESC controls.
3) Traffic control, dust control and cleanup for our work only.
4) Layout for our work only.
5) Install bio retention pond per plans and specs.
6) Export of extra spoils not needed.
7) Installation of storm system per plans and specs.
8) Remove existing gravel parking lot.
9) Provide 8” ClassII sand and grade and compact in new Parking area.
10) Provide 8” of 21AA Crushed Concrete and grade and compact in new parking area.
11) Install new sidewalk with 4” of sand base per plans.
12) Install stone in new retention pond.
13) Install 2” leveling course and 1 1/2” surface coat of asphalt per specs.
14) Topsoil, seed and straw areas that we disturbed from installation of new storm system and parking lot.
15) Do final clean up of site from any trash or debris caused by us.

Our scope has the following exclusions:

1) Permits, tap fees and bonds.
2) Security.
3) Temporary or permanent fencing.
4) Hazardous material identification or removal.
5) Excavation and backfill for any items other than those listed above.
6) Dewatering in excess of one 2" pump and generator.
7) Pipe work other than storm pipe specified in plans.
8) Landscaping other than seeding and straw.

Any unsuitable soils encountered onsite will be treated as an extra to the above base bid. Thank you for your consideration.

Total bid price $ 140,000.00

Sincerely,

Robert Killingsworth
Leavitt & Starck Excavating, Inc.
517-202-2940

SITE PLAN:

WISWASSER PARK

BATH TOWNSHIP, INGHAM COUNTY, MICHIGAN

BENCHMARKS:

BENCHMARK #1 ELEV. = 850.70 (NAVD88)
FOUND RAILROAD SPIKE IN NORTH SIDE OF UTILITY POLE
±10' SOUTH OF EDGE OF ASPHALT OF PARK LAKE ROAD,
±8' WEST OF CONCRETE DRIVEWAY #15404 PARK LAKE RD.

BENCHMARK #2 ELEV. = 847.07 (NAVD88)
SET PK NAIL IN NORTHEAST SIDE OF UTILITY POLE
±15' SOUTH OF EDGE OF ASPHALT OF PARK LAKE ROAD,
±9' WEST OF BACK OF CURB OF PARK LAKE ROAD, ±265'
NORTHWEST OF DRIVEWAY

EX SEWER INVENTORIES

CATCH BASIN #100
RIM – 848.27
18" CMP NE – 845.66
18" HDPE S – 845.65
18" HDPE NW – 845.56

CATCH BASIN #101
RIM – 852.12
12" HDPE NW – 849.79

CATCH BASIN #102
RIM – 848.04
16" HDPE SE – 845.80
12" HDPE SE – 845.84
18" HDPE SW – 845.74
8" HDPE NE – 845.35
(FULL OF WATER)
PROP 12" E IE = 845.75

CATCH BASIN #103
RIM – 848.44
12" HDPE SE – 846.06
16" HDPE NW – 846.10

CATCH BASIN #104
RIM – 847.46
8" HDPE SE – 846.36
6" CPP NW – 846.53

LAWN BASIN #105
RIM – 848.44
12" HDPE NW – 846.58
12" HDPE SW – 846.58

LAWN BASIN #106
RIM – 849.02
12" HDPE E – 846.77
12" HDPE W – 846.77

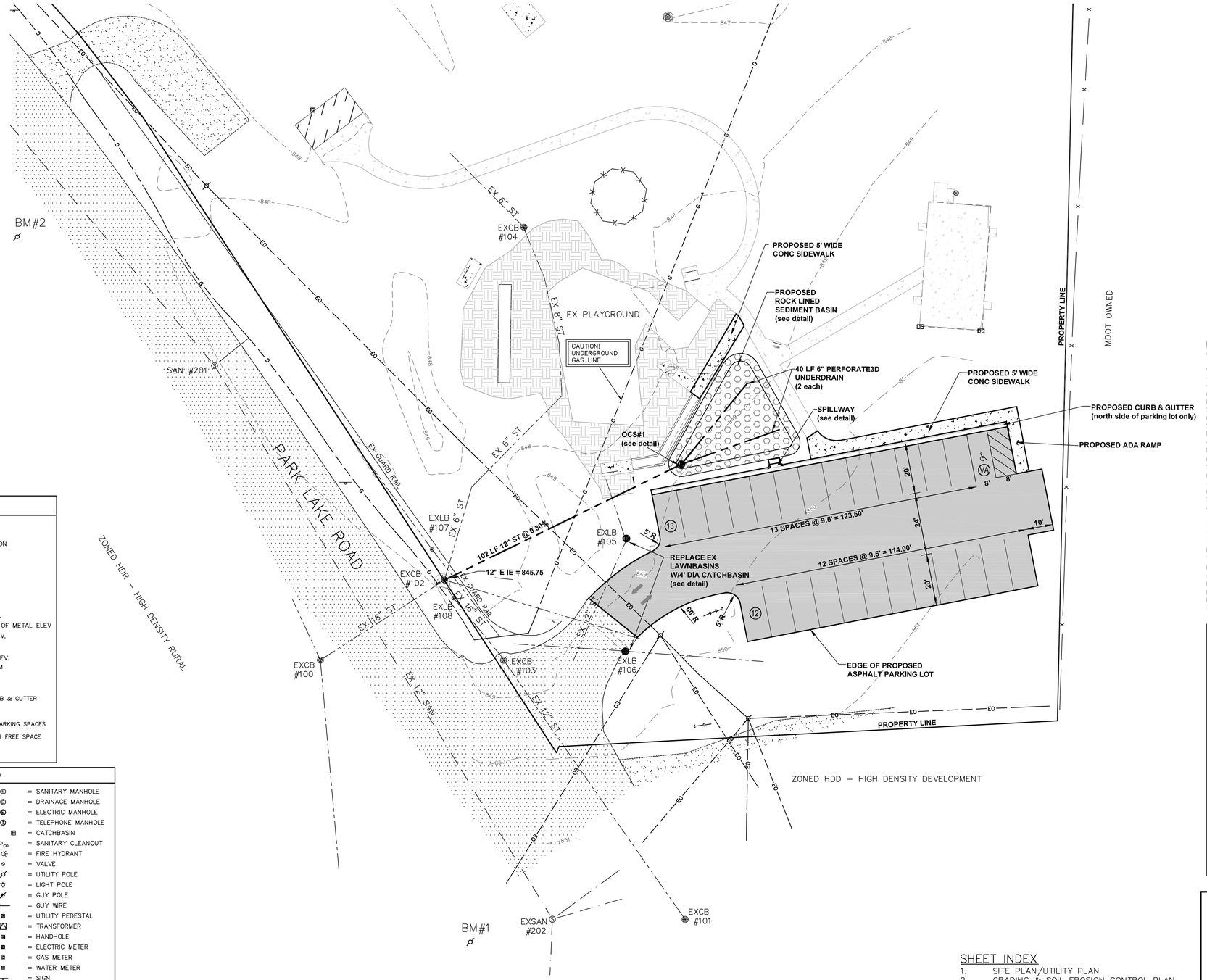
LAWN BASIN #107
RIM – 847.10
6" CPP NW – 845.90
6" CPP SE – 845.90
LAWN BASINS 105 & 106
CONNECT TO CB #102 INDIRECTLY –
EXACT LOCATION OF UNDERGROUND
PIPING UNKNOWN

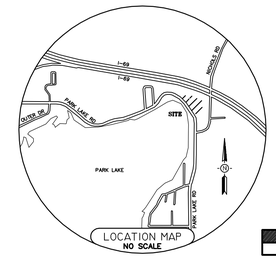
LAWN BASIN #108
RIM – 847.59
16" HDPE NW – 845.85
16" HDPE SE – 845.85

SANITARY MANHOLE #200
RIM – 848.30
12" VCP SE – 838.72
12" VCP NW – 838.65

SANITARY MANHOLE #201
RIM – 848.01
8" PVC NE – 842.67
12" VCP SE – 839.71
12" VCP NW – 839.66

SANITARY MANHOLE #202
RIM – 851.82
10" VCP NE – 840.48
10" VCP NE – 840.40
12" VCP S – 840.22
12" VCP NW – 840.15





SCALE 1" = 20'

0' 20' 40'

SURVEYOR'S NOTES:

1. This plan was made at the direction of the parties named hereon and is intended solely for their immediate use. Survey prepared from fieldwork performed in October 2022.
2. All bearings are Michigan State Plane South Zone grid bearings obtained from GPS observations using corrections obtained from the nearest National Geodetic Survey C.O.R.S. station.
3. All dimensions shown are as–measured unless otherwise noted.
4. All elevations are North American Vertical Datum of 1988 (NAVD88).
5. All dimensions are in feet and decimals thereof.
6. No building tie dimensions are to be used for establishing the property lines.
7. Easements, if any, not shown hereon.
8. By scaled map location and graphic plotting only, this property lies entirely within Flood Zone "X", areas outside the 0.2% annual chance floodplain, according to the National Flood Insurance Program, Flood Insurance Rate Map for the Charter Township of Bath, Clinton County, Michigan, Community Panel No. 261175 C0341D, dated May 3, 2011.
9. Utility information as shown was obtained from available public records and from supporting field observations, where possible, and is subject to verification in the field by the appropriate authorities prior to use for construction. MISS DIG was not contacted to mark utilities on site.
10. Wetlands, if any, not shown hereon.

LEGAL DESCRIPTION:
(As provided by KEBS, Inc. Survey Job No. 100494.BND)

Overall Combined Parcel:
A parcel of land being the entirety of Lots 5 through 18, inclusive, and a portion of Lot 4, Lot 19, and Outlot A of "Lake View" as recorded in Liber 2 of Plats, Page 9, Clinton County, Michigan, records, and part of Outlot B of "Supervisor's Plat of Pleasant View of Park Lake" as recorded in Liber 2 of Plats, Pages 11–12, Clinton County, Michigan, records, and part of the Northeast 1/4 of Section 28, T5N, R1W, Bath Township, Clinton County, Michigan, the surveyed boundary of said parcel more particularly described as: Commencing at the Northwest corner of said Section 28; thence S00°22'51"E along the West line of said Section 28 a distance of 1143.55 feet to the South line of Interstate I–69; thence along said South right–of–way line the following three courses: 527.26 feet along a curve to the left having a radius of 5879.58 feet, a delta angle of 5°08'17", and a long chord bearing S77°54'02"E 527.08 feet; S80°28'10"E 1659.12 feet; and 572.24 feet along a curve to the right having a radius of 3669.72 feet, a delta angle of 8°56'04", and a long chord bearing S76°00'08"E 571.66 feet to the point of beginning; thence 357.39 feet continuing along said South right–of–way line along a curve to the right having a radius of 3669.72 feet, a delta angle of 5°34'48", and a long chord bearing S68°44'43"E 357.25 feet to the West line of a limited access right–of–way as described in Liber 660 of Deeds, Page 41, Clinton County, Michigan, records; thence S01°14'24"W along said West line 317.18 feet to the South line of said Outlot B of "Supervisor's Plat of Pleasant View of Park Lake"; thence S87°02'36"W along said South line and South line extended 192.43 feet to the East line of said "Lake View"; thence S21°37'32"W along said East line 2.59 feet to the Southernmost corner of said "Lake View"; thence along the Southwest line of said "Lake View" the following seven courses: N33°02'32"W 292.85 feet to the Westernmost corner of Lot 10; N37°38'32"W to the Westernmost corner of Lot 9; N41°41'14"W 40.39 feet to the Westernmost corner of Lot 8; N45°09'14"W 40.39 feet to the Westernmost corner of Lot 7; N46°18'14"W 40.39 feet to the Westernmost corner of Lot 6; N50°25'14"W 40.39 feet to the Westernmost corner of Lot 5; and N51°56'14"W 14.49 feet to the East line of the West 25.90 feet of Lot 4; thence N36°20'57"E along said East line 99.10 feet to the Northeast line of said Lot 4; thence S54°16'23"E along said Northeast line 18.67 feet to the Northernmost corner of said Lot 5; thence S47°15'23"E along the Northeast lines of Lots 5, 6 and 7 a distance of 107.64 feet; thence N21°48'02"E 69.30 feet to the point of beginning, containing 3.17 acres, more or less; said parcel subject to all easements and restrictions, if any.

SITE DATA
PROPOSED PROJECT: PARKING LOT & DRAINAGE UPGRADES
TOTAL SITE AREA = 3.17 ACRES
ZONED P (PUBLIC) & R (RURAL)
ADDRESS: 6499 PARK LAKE ROAD
PARCEL NUMBER: 010–340–000–035–01 & 010–230–000–009–00
OWNER: BATH CHARTER TOWNSHIP

PARKING REQUIREMENTS
NUMBER OF PARKING SPACES:
NO REQUIREMENT LISTED FOR PUBLIC PARK
26 SPACES PROVIDED WITH 1 BEING AN ACCESSIBLE SPACE

PARKING LOT INTERIOR LANDSCAPING:
NONE REQUIRED SINCE ZONED PUBLIC & RURAL

PARKING SETBACKS:
REQUIRED: 10' FROM RESIDENTIALLY ZONE ADJOINER
PROVIDED: 36' TO PROPERTY TO SOUTH

PARKING DIMENSIONS:
9.5' X 20' SPACES & 24' TWO WAY AISLE (PROVIDED)

PROPOSED LEGEND

- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- 856 PROPOSED CONTOUR ELEVATION
- PROPOSED HYDRANT
- PROPOSED GATE VALVE
- PROPOSED SAN. M.H.
- PROPOSED STORM M.H.
- PROPOSED CATCHBASIN
- CO PROPOSED CLEAN–OUT
- F–F 800.00 PROPOSED FIRST FLOOR ELEV.
- TC 800.00 / 799.39 PROP TOP OF CURB W/EDGE OF METAL ELEV
- 800.00 PROPOSED TOP OF PAV'T ELEV.
- ME±800.00 MATCH EXISTING ELEV.
- BW 800.00 PROPOSED BACK OF WALK ELEV.
- S55 DENOTES S.E.S.C. KEYING SYSTEM
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED INVERTED CONC. CURB & GUTTER
- 2.9% PROPOSED SLOPE
- 0 PROPOSED NUMBER OF 9'x20' PARKING SPACES
- VA PROPOSED VAN ACCESS BARRIER FREE SPACE
- BF PROPOSED BARRIER FREE SPACE

EXISTING LEGEND

(M)	= MEASURED DISTANCE	S	= SANITARY MANHOLE
(R)	= RECORD DISTANCE	D	= DRAINAGE MANHOLE
●	= SET 1/2" BAR WITH CAP	E	= ELECTRIC MANHOLE
□	= FOUND IRON AS NOTED	T	= TELEPHONE MANHOLE
	= DEED LINE	⊗ ▦	= CATCHBASIN
	= DISTANCE NOT TO SCALE	○CO	= SANITARY CLEANOUT
	= FENCE		= FIRE HYDRANT
	= ASPHALT		= VALVE
	= CONCRETE		= UTILITY POLE
	= GRAVEL		= LIGHT POLE
860	= EXISTING CONTOUR ELEVATION		= GUY POLE
	= BUILDING OVERHANG		= GUY WIRE
EX S&N	= SANITARY SEWER		= UTILITY PEDESTAL
EX ST	= STORM SEWER		= TRANSFORMER
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G	= GAS LINE		= ELECTRIC METER
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	= EDGE OF WOODS		= AIR CONDITIONING UNIT
	= DECIDUOUS TREE		
	= CONIFEROUS TREE		

SHEET INDEX

REVISIONS

KEBS, INC.
KYES ENGINEERING
BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517–339–1014 FAX. 517–339–8047
Marshall Office
Ph. 269–781–9800

Wiswasser Park
Parking Lot & Drainage Upgrades
SITE & UTILITY PLAN

HORZ SCALE: 1"= 20'	DESIGNER: DCD	APPROVED BY: GAP
DATE: 3/31/23	PROJECT MGR. GAP	SHEET 1 OF 4
AUTHORIZED BY: BATH TOWNSHIP		JOB #: 100494

BENCHMARKS:

BENCHMARK #1 ELEV. = 850.70 (NAVD88)
FOUND RAILROAD SPIKE IN NORTH SIDE OF UTILITY POLE ±10' SOUTH OF EDGE OF ASPHALT OF PARK LAKE ROAD, ±8' WEST OF CONCRETE DRIVEWAY #15404 PARK LAKE RD.

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RIM – 851.82
10" VCP NE – 840.48
10" VCP NE – 840.40
12" VCP S – 840.22
12" VCP NW – 840.15

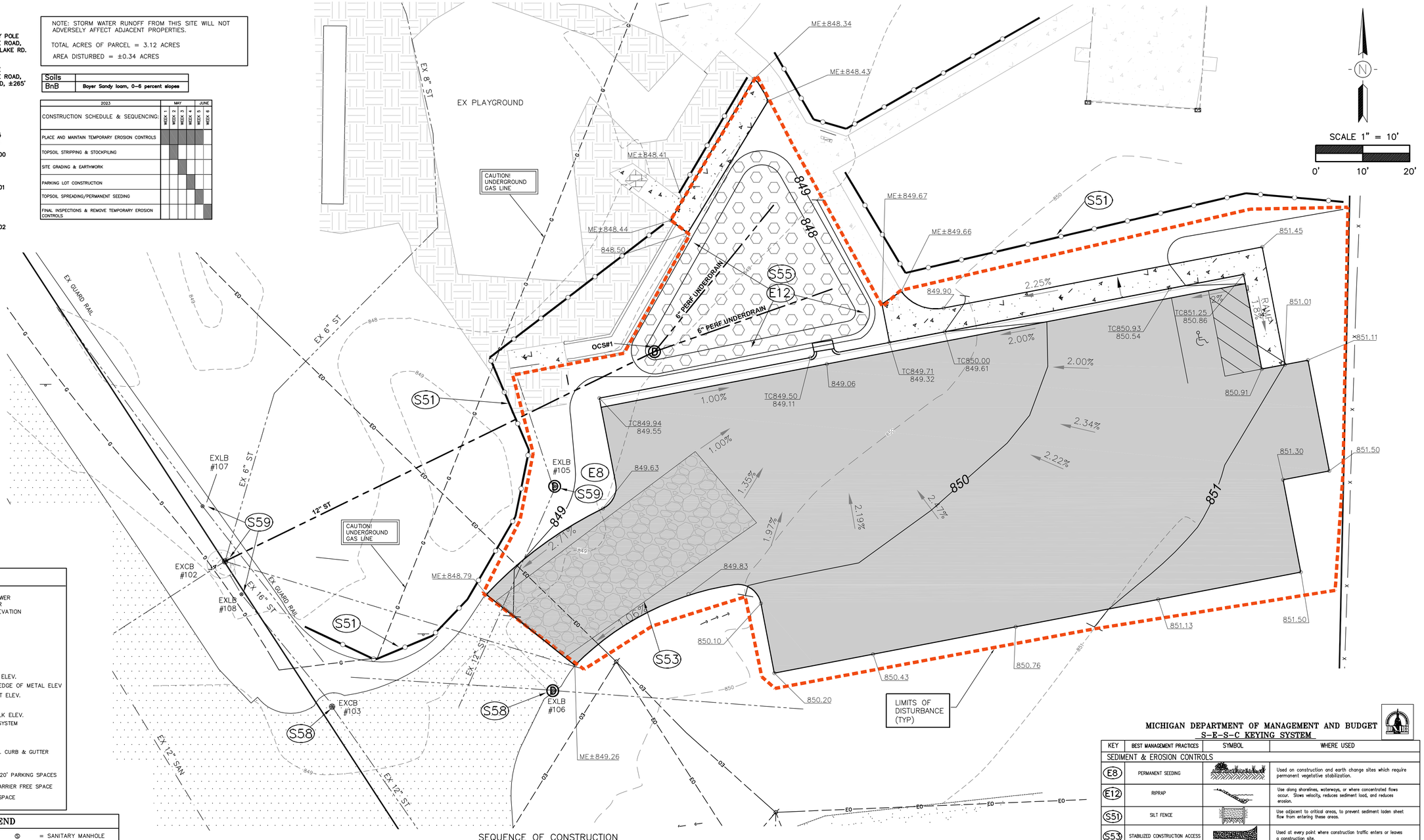
NOTE: STORM WATER RUNOFF FROM THIS SITE WILL NOT ADVERSELY AFFECT ADJACENT PROPERTIES.

TOTAL ACRES OF PARCEL = 3.12 ACRES

AREA DISTURBED = ±0.34 ACRES

Soils	
BnB	Boyer Sandy loam, 0–6 percent slopes

2023	MAY				JUNE	
CONSTRUCTION SCHEDULE & SEQUENCING:	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
PLACE AND MAINTAIN TEMPORARY EROSION CONTROLS						
TOPSOIL STRIPPING & STOCKPILING						
SITE GRADING & EARTHWORK						
PARKING LOT CONSTRUCTION						
TOPSOIL SPREADING/PERMANENT SEEDING						
FINAL INSPECTIONS & REMOVE TEMPORARY EROSION CONTROLS						



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- PROPOSED ASPHALT
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- PROPOSED INVERTED CONC. CURB & GUTTER
- 2.9% — PROPOSED SLOPE
- (0) — PROPOSED NUMBER OF 9'x20' PARKING SPACES
- (VA) — PROPOSED VAN ACCESS BARRIER FREE SPACE
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	= BUILDING OVERHANG		= GUY WIRE
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EO	= OVERHEAD WIRES		= POST
	= EDGE OF WOODS		= AIR CONDITIONING UNIT
	= DECIDUOUS TREE		
	= CONIFEROUS TREE		

SOIL EROSION CONTROL NOTES:

1. ALL SOIL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE EATON COUNTY DRAIN COMMISSION REQUIREMENTS AND PROJECT SPECIFICATIONS.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR TO DETERMINE EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES, AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. ANY EROSION OR SEDIMENT FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT BE ALLOWED TO COLLECT ON ANY OFF–SITE AREAS, OR IN WATERWAYS; WATERWAYS INCLUDE BOTH NATURAL AND MANMADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS. STOCKPILING OF SOIL SHALL BE SURROUNDED BY SILT FENCE, & SEEDED IF LEFT OVER 30 DAYS.
4. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED AND AS DIRECTED ON THESE PLANS. HE SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER EARTH CHANGES HAVE BEEN ESTABLISHED.
5. A MINIMUM 50' LONG BY 12' WIDE, 8" DEEP CLEAN STONE EXIT SHALL BE PROVIDED AT ALL CONSTRUCTION ENTRANCES. SHOULD THE STONE BECOME LESS EFFICIENT IT SHALL BE REPLACED. ALL CONSTRUCTION TRAFFIC WILL USE THE CLEAN STONE EXITS.
6. DUST CONTROL WILL BE EXERCISED AT ALL TIMES WITHIN THE PROJECT BY THE CONTRACTORS. SPRINKLING TANK TRUCKS SHALL BE AVAILABLE AT ALL TIMES TO BE USED ON HAUL ROUTES OR OTHER PLACES WHERE DUST BECOMES A PROBLEM
7. ALL MUD, DIRT AND DEBRIS TRACKED ONTO EXISTING ROADS SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR NO LESS THAN ON A DAILY BASIS.
PUBLIC STREETS SHALL BE KEPT CLEAN AND FREE OF TRACKED SEDIMENT. A STREET SWEEPER OR A BOBCAT WITH A BROOM ATTACHMENT SHOULD BE KEPT ON SITE TO DEAL WITH ANY OFF–SITE TRACKING AS IT OCCURS.

SEQUENCE OF CONSTRUCTION

1. INSTALL ALL TEMPORARY SILT FENCE PER PLAN AND AS SHOWN ON THE DETAIL SHEET.
2. INSTALL TEMPORARY CONSTRUCTION ENTRANCE/EXIT AT LOCATION SHOWN ON PLANS.
3. INSTALL GEOTEXTILE FILTER FABRIC DROPS IN ALL CB'S IN CURB OR PAVED AREAS. USE ADVANEDGE INLET PROTECTION IN PLACE OF S58 AT ALL STRUCTURES IN SEEDED OR LANDSCAPE AREAS AND ALL OTHER STRUCTURES UNTIL CURB OR PAVEMENT HAS BEEN PLACED.
4. WHILE MAINTAINING A VEGETATIVE BUFFER WHENEVER POSSIBLE STRIP AND STOCKPILE TOPSOIL ABOVE AREAS OF PROPOSED EXCAVATION OR GRADING FOR LATER USE ON SITE PLACE STOCKPILED TOPSOIL IN AREAS WHICH ARE NEITHER SUBJECT TO HIGH RUNOFF NOR ALONG STEEP SLOPES SEED AND MULCH STOCKPILES IMMEDIATELY TO PREVENT WIND BLOWN SEDIMENT POLLUTION AND EXCESSIVE DUST.
5. EXCAVATE FOR PROPOSED ROAD AND UTILITY CONSTRUCTION AS NECESSARY. DO NOT EXPOSE AREAS FAR IN ADVANCE OF THE PROPOSED CONSTRUCTION FOR THAT AREA. ROUGHEN AND SCARIFY EXPOSED SURFACES TO REDUCE RUNOFF VELOCITY AND SEDIMENTATION. MAINTAIN VEGETATION WHENEVER POSSIBLE TO PROVIDE A NATURAL
6. AFTER COMPLETION OF THE PROPOSED UTILITIES, INSTALL TEMPORARY SEDIMENT BARRIERS WITH SILT FENCE AROUND ALL DISTURBED AREAS.
7. INSTALL TEMPORARY STONE FILTER BERMS PERPENDICULAR TO EXPOSED STEEP SLOPES IF SHOWN AT SPECIFIC LOCATIONS ON THE PLANS OR AS MAY BE NEEDED DURING CONSTRUCTION. USE TEMPORARY STONE CHECK DAMS TO SLOW DOWN AND / OR DIVERT HEAVY RUNOFF IF SHOWN AT SPECIFIC LOCATIONS ON THE PLANS OR AS MAY BE NEEDED DURING CONSTRUCTION.
8. TOPSOIL, SEED, FERTILIZE AND MULCH ALL EXPOSED AREAS AS SOON AS FEASIBLE TO PROTECT AND RESTORE PERMANENT VEGETATION.
9. WATER EXPOSED GROUND REGULARLY TO CONTROL AIRBORNE PARTICULATE MATTER.
10. THE CONTRACTOR SHALL MAINTAIN ALL TEMPORARY AND PERMANENT SOIL EROSION AND SEDIMENTATION CONTROL MEASURES THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS AND UNTIL PERMANENT VEGETATION IS REASTABLISHED IN ALL EXPOSED AREAS. REMOVE ACCUMULATED SEDIMENT FROM ALL STRUCTURES.
11. THE SITE WILL BE PERIODICALLY INSPECTED BY THE CLINTON COUNTY DRAIN OFFICE. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE RULES AND REGULATIONS OF THAT OFFICE
12. UPON FINAL APPROVED INSPECTION OF THE COMPLETED CONSTRUCTION BY ALL REVIEWING AGENCIES,

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET
S–E–S–C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
SEDIMENT & EROSION CONTROLS			
E8	PERMANENT SEEDING		Used on construction and earth change sites which require permanent vegetative stabilization.
E12	RIPRAP		Use along shorelines, waterways, or where concentrated flows occur. Slows velocity, reduces sediment load, and reduces erosion.
S51	SILT FENCE		Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
S53	STABILIZED CONSTRUCTION ACCESS		Used at every point where construction traffic enters or leaves a construction site.
S55	SEDIMENT BASIN		At the outlet of disturbed areas and at the location of a permanent detention basin.
S58	INLET PROTECTION FABRIC DROP		Use at stormwater inlets, especially at construction sites.
S59	INLET PROTECTION FABRIC FENCE		Use at stormwater inlets, especially at construction sites.

REVISIONS

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517–339–1014 FAX. 517–339–8047
Marshall Office
Ph. 269–781–9800

Wiswasser Park
Parking Lot & Drainage Upgrades
GRADING & SOIL EROSION CONTROL PLAN

HORZ SCALE: 1"= 10'	DESIGNER: DCD	APPROVED BY: GAP
DATE: 3/31/23	PROJECT MGR. GAP	SHEET 2 OF 4
AUTHORIZED BY: BATH TOWNSHIP		JOB #: 100494

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E8 PERMANENT SEEDING SPECIFICATIONS

When
- To finalize stabilization of temporary seeding areas or when an area needs permanent stabilization following completion of construction. Also used when vegetative establishment can correct existing soil erosion or sedimentation problem.
- Within 5 days of final grade.

Why
- To stabilize soil and prevent or reduce soil erosion/sedimentation problems from developing.

Where
- Used on construction and earth change sites which require permanent vegetative stabilization.

How
1. Review SESC plan and construction phasing to identify areas in need of permanent vegetative stabilization.
2. Select perennial grass and ground cover for permanent cover.
3. Seed mixes vary. However, they should contain native species.
4. Seed mixes should be selected through consultation with a certified seed provider and with consideration of soil type, light, moisture, use applications, and native species content.
5. Soil tests should be performed to determine the nutrient and pH levels in the soil. The pH may need to be adjusted to between 6.5 and 7.0.
6. Prepare a 3–5" deep seedbed, with the top 3–4" consisting of topsoil.
7. Slopes steeper than 1:3 should be roughened.
8. Apply seed as soon as possible after seedbed preparation. Seed may be broadcast by hand, hydroseeding, or by using mechanical drills.
9. Mulch immediately after seeding.
10. Dormant seed mixes are for use after the growing season, using seed which lies dormant in the winter and begins growing as soon as site conditions become favorable.

STANDARD SYMBOL

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

E8 PERMANENT SEEDING SPECIFICATIONS (cont.)

How (cont.)
11. Protect seeded areas from pedestrian or vehicular traffic.
12. Divert concentrated flows away from the seeded area until vegetation is established.

Maintenance
- Inspect weekly and within 24 hours following each rain event in the first few months following installation to be sure seed has germinated and permanent vegetative cover is being established.
- Add supplemental seed as necessary.

Limitations
- Seeds need adequate time to establish.
- May not be appropriate in areas with frequent traffic.
- Seeded areas may require irrigation during dry periods.
- Seeding success is site specific, consider mulching or sodding when necessary.

PERMANENT SEEDING SPECIFICATION

SEED ALL DISTURBED AREAS WITH THE FOLLOWING SEED MIXTURE OR APPROVED EQUAL.
MICHIGAN GREEN – 15% BLUEGRASS, 40% FESCUE, 45% RYEGRASS
APPLY AT A RATE OF 5 LBS./1000 SF.

–APPLY SILT STOP OR APPROVED TACKIFIER TO SEED MIX.

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

E8 PERMANENT SEEDING

Planting Zones:	Lower Peninsula (South of T20N) Zone 1	Lower Peninsula (North of T20N) Zone 2	Upper Peninsula Zone 3
Seeding Window Permanent Seeding	4/15 – 10/10	5/1 – 10/1	5/1 – 9/20
Seeding Window Dormant Seeding*	11/15 – Freeze	11/01 – Freeze	11/01 – Freeze

Source: Adapted from MDOT Interim 2003 Standard Specifications for Construction

	Zone 1 Lower Peninsula (South of U.S. 10)	Zone 2 Lower Peninsula (North of U.S. 10)	Zone 3 Upper Peninsula
Seeding Dates (with Irrigation or Mulch)	4/1 – 8/1	5/1 – 9/20	5/1 – 9/10
Seeding Dates (w/o Irrigation or Mulch)	4/1 – 5/20 or 8/10 – 10/1	5/1 – 6/10 or 8/1 – 9/20	5/1 – 8/15 or 8/1 – 9/20
Dormant Seeding Dates*	11/1 – Freeze	10/25 – Freeze	10/25 – Freeze

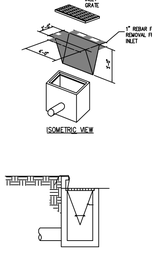
Source: Adapted from USDA NRCS Technical Guide §342 (1999)

* Dormant seeding is for use in the late fall after the soil temperature remains consistently below 50°F, prior to the ground freezing. This practice is appropriate if construction on a site is completed in the fall but the seed was not planted prior to recommended seeding dates. No seed germination will take place until spring. A cool season annual grass may be added in an attempt to have some fall growth.

- Mulch must be used with dormant seed.
- Do not seed when the ground is frozen or snow covered.
- Do not use a dormant seed mix on grassed waterways.

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

S58 INLET PROTECTION – FABRIC DROP



STANDARD SYMBOL

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

INLET PROTECTION – FABRIC DROP SPECIFICATIONS S58

When
- When sediment laden stormwater requires treatment before entering a stormwater drainage system.

Why
- To prevent sediment from entering stormwater systems.

Where
- Use in or at stormwater inlets, especially at construction sites or in streets.

How
1. A filter fabric bag is hung inside the inlet, beneath the grate.
2. Replace grate, which will hold bag in place.
3. Anchor filter bag with 1" rebar for removal from inlet.
4. Flaps of bag that extend beyond the bag can be buried in soil in earth areas.

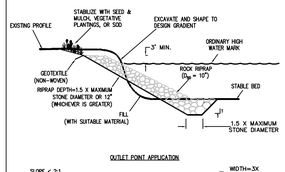
Maintenance
- Drop inlet filters should be inspected routinely and after each major rain event.
- Damaged filter bags should be replaced.
- Clean and/or replace filter bag when 1/2 full.
- Replace clogged fabric immediately.
- If needed, initiate repairs immediately upon inspection.
- Remove entire protective mechanism when upgradient areas are stabilized and streets have been swept.

Limitations
- Can only accommodate small flow quantities.
- Requires frequent maintenance.
- Ponding may occur around storm drains if filter is clogged.

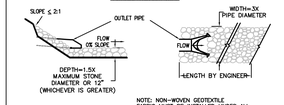
MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

E12 RIPRAP

STREAM BANK APPLICATION



OUTLET POINT APPLICATION



NOTE: NON-WOVEN GEOTEXTILE FABRIC MUST BE INSTALLED UNDER ALL RIPRAP AND TOED–IN A MIN. OF 12"

STANDARD SYMBOL

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

E12 RIPRAP SPECIFICATIONS

When
- When concentrated water flows have the potential to create scour, down–cutting, or lateral cutting.

Why
- To prevent loss of land or damage to utilities or structures. In aquatic applications, riprap is used to control channel meander and maintain capacity, protect against wave attack, and reduce sediment load.

Where
- In natural or constructed channels with areas susceptible to erosion from the action of water, ice, or debris, or to damage by livestock or vehicular traffic.
- In shoreline areas where the erosion problem may be solved through simple structural measures.
- On slopes with profiles measuring 1:1.5 or less.

How
1. Review subject site to identify areas subject to concentrated flows or wave/current attack.
2. The appropriateness and extent of riprap placement is site specific and should be determined in the field.
3. The area under review for riprap placement must be shaped and contoured appropriately by grading prior to material placement.
4. Non–woven geotextile fabric should be installed prior to riprap placement, with upper end and toe end of fabric buried or anchored to prevent movement.
5. Riprap placement should be started at a stabilized location and ended at a stabilized or contoured point.
6. Material selected for riprap should be hard, angular, and resistant to weathering. Appropriate material size depends on expected water energy and intended function of the material.

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

E12 RIPRAP SPECIFICATIONS (cont.)

How (cont.)
7. Riprap mixture should be an even mixture of stone sizes based on the average, or D_{50}. This means 50% of the stone, by size, will be larger than the diameter specified, and 50% will be smaller than the size specified. The diameter of the largest stone should not be more than 1.5 times the D_{50} stone size.
8. See table on the following page for typical riprap stone sizes.
9. Rock shall be placed so that larger rocks are uniformly distributed and in contact with one another. Smaller rocks should fill the voids.
10. When in contact with moving water, riprap will tie into a stable bank at the downstream end and will be keyed into the bank at the upstream end. Riprap should extend 3 ft. above the ordinary high water mark or to the top of the bank on short slopes. Extend riprap a minimum 10 ft. beyond active erosion area.

Maintenance
- All installations should be inspected immediately after the first rainfall to confirm the stability of the placed material. Follow–up inspections should occur regularly and provisions made for prompt repair if needed.

Limitations
- Area is cleared prior to the addition of riprap, therefore no areas are preserved with native vegetation.

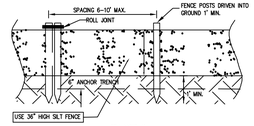
SIZE OF TYPICAL RIPRAP STONES

Weight (lbs.)	Average Spherical Diameter (D_{50})	Typical Rectangular Slope Length (L_R)	Typical Rectangular Slope Width/Height (W_R)
	(in.)	(ft.)	(in.)
50	10	10	5
100	12	12	6
150	14	14	7
300	18	18	9
500	21	21	10.5
1000	27	27	13.5
1500	31	31	15.5
2000	34	34	17
2500	37	37	18.5
3000	40	40	20
4000	44	44	22
5000	48	48	24

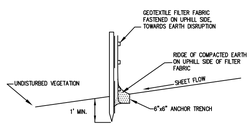
Source: Adapted from USDA NRCS

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

S51 SILT FENCE



ROLL JOINTS



STANDARD SYMBOL

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

SILT FENCE SPECIFICATIONS S51

When
- A temporary measure for preventing sediment movement.

Why
- Used to prevent sediment suspended in runoff from leaving an earth change area.

Where
- Use adjacent to critical areas, wetlands, base of slopes, and watercourses.

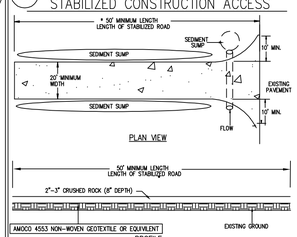
How
1. Install parallel to a contour.
2. The silt fence should be made of woven geotextile fabric.
3. Silt fence should accomodate no more than 1/2 to 1 acre of drainage per 100' of fence and on slopes less than 1:2 (v:h).
4. Dig a 6" trench along the area where the fence is to be installed.
5. Place 6" of the silt fence bottom flap into the trench.
6. Backfill the trench with soil and compact the soil on both sides. Create a small ridge on the up–slope side of the fence.
7. Install wooden stakes 6 – 10' apart and drive into the ground a minimum of 12".
8. Staple the geotextile fabric to the wooden stakes.
9. Join sections of silt fence by wrapping ends together (See drawing).

Maintenance
- Inspect frequently and immediately after each storm event. Check several times during prolonged storm events. If necessary, repair immediately.
- If the sediment has reached 1/3 the height of the fence, the soil should be removed and disposed of in a stable upland site.
- The fence should be re–installed if water is seeping underneath it or if the fence has become ineffective.
- Silt fence should be removed once vegetation is established and up–slope area has stabilized.

Limitations
- Silt fence may cause temporary ponding and could fail if too much water flows through the area.
- Do not use in areas with concentrated flows.
- Chance of failure increases if fence is installed incorrectly or if sediment accumulation is not removed.

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

S53 STABILIZED CONSTRUCTION ACCESS



NOTES:
1. Establish stabilized construction entrance prior to the initiation of site construction activities.
2. Care should be taken to prevent material movement into adjacent wetlands/waterbodies.
3. Care should be taken to maintain existing roadside drainage via culvert installation, with sediment sump placed downflow of culvert.

STANDARD SYMBOL

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS S53

When
- Construction traffic is expected to leave a construction site.
- Stabilization of interior construction roads is desired.

Why
- To minimize tracking of sediment onto public roadways and to minimize disturbance of vegetation.

Where
- Stabilized construction entrances shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must be routed over the rock ingress/egress corridor.

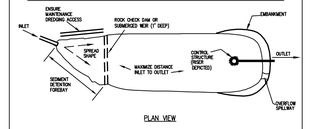
How
1. Stabilized construction access road should be established at the onset of the construction activities and maintained in place for the duration of the construction project.
2. Installation of this practice should be the responsibility of the site clearing or excavating contractor.
3. Access location should be cleared of woody vegetation.
4. Non–woven geotextile fabric shall be placed over the existing ground prior to placing stone.
5. Access size should be a minimum of 50'. (30' for single residence lot).
6. Access width should be 12' minimum, flared at the existing road to provide a turning radius.
7. Crushed aggregate (2" to 3"), or reclaimed or recycled concrete equivalent, shall be placed at least 8" deep over the length and width of the ingress/egress corridor.

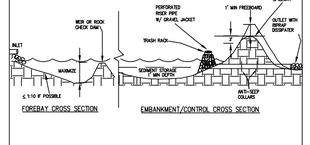
Maintenance
- Periodic inspection and needed maintainence shall be provided after each rain event.
- Stabilized entrances shall be repaired and rock added as necessary.
- Sediment deposited on public rights–of–way shall be removed immediately and returned to the construction site.
- If soils are such that washing of tires is required, it shall be done in a wash rack area, stabilized with stone, immediately prior to the construction access stabilized corridor.
- At the project completion, rock access road should be removed and disposed of unless utilized as subgrade for final road.

Limitations
- Effectiveness limited, sediment may be tracked onto roads requiring additional action.

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

S55 SEDIMENT BASIN





STANDARD SYMBOL

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

SEDIMENT BASIN SPECIFICATIONS S55

When
- When site runoff is sediment–laden and/or runoff release rate is required.

Why
- To detain runoff sufficiently to allow excessive sediment to settle out before stormwater leaves construction site.

Where
- At the outlet of any disturbed area or at the ultimate site outlet.
- Should be used in association with dikes, temporary channels, and pipes to divert stormwater from the disturbed areas into the basin.
- May be combined with permanent detention basin.

How
1. Basin to be designed by engineer or CPESC to ensure adequate storage volume from the contributing drainage area.
2. Basins should be constructed before clearing and grading work begins.
3. Basins should be located at the stormwater outlet for the site and multiple basins may be located throughout the site.
4. Basin location should ensure suitable access for maintenance and cleanout.
5. Do not locate in a stream.
6. All basin sites should be located where embankment failure will not compromise safety or result in property damage.
7. The basin volume should be designed to handle the volume of stormwater expected from the disturbed acreage for a minimum 10–year storm event.
8. The basin volume consists of two zones
   - A sediment storage zone to a 1' minimum depth.
   - A settling zone at least 2 feet deep.

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

S55 SEDIMENT BASIN SPECIFICATIONS

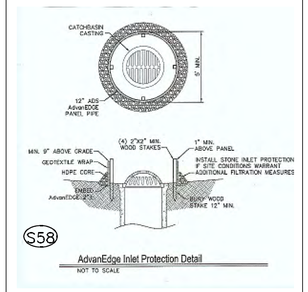
How (cont.)
9. Design should contain sufficient capacity to detain runoff for 24–48 hours, maximizing sediment settlement potential.
10. Length to width ratio should be greater than 4:1 to allow for sufficient settlement time.
11. Utilize a well anchored riser pipe with anti–seep collars as the principal outlet, along with an emergency overflow spillway for major events.

Maintenance
- Inspect weekly and after each major storm event.
- Check the depth of sediment deposit to insure capacity of basin storage is adequate for stormwater and sediment deposition.
- Remove sediment when the foreboy or basin design depth is 50% full of sediment.

Limitations
- Liability concerns based on failure of the basin and flooding of adjacent properties.
- May become an attractive nuisance to children and waterfowl.
- Typically, permanent basins are used for drainage of 5 acres or more.
- Effective in removing sediment down to the medium silt size fraction, however, not effective with fine silt and clay without extending detention time.

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

S58 AdvanEdge Inlet Protection Detail



NOT TO SCALE

E6 MULCHING SPECIFICATIONS

When
- When areas are subject to erosive surface sheet flows or severe wind.

Why
- Temporarily protects seeded areas and slopes against erosion from rain or wind. Holds soil moisture to allow for seed germination and reduces wind dessication of germinated seeds. Inhibits seed consumption by birds.

Where
- Use on exposed slopes, newly seeded areas and other areas subject to erosion.

How
1. Other surface runoff control measures should be installed prior to mulching.
2. Prepare surface to proper grade and compaction requirements.
3. If treatment area is to be revegetated immediately, spread or drill seed, or install vegetative sprigs into planting surface.
4. Select mulch material appropriate for site characteristics, including grade, level of traffic, installation method, and accessibility.
   Straw – Most common and widely used material. Provides organic matter as it breaks down. Effectiveness of sediment reduction high for at least 3 months. Subject to windblow and washout. For straw, apply a minimum of 2 tons/acre or approx. 50 lbs./1000 sq.ft. to cover the surface. Increase application rates 50% for dormant seeding.
   Rock – Crushed stone and gravel maintain effectiveness indefinitely if maintained to repair compaction. Cover 2–3" in depth (approx. 2.27 tons/1000 sq. ft.).
   Wood chips/bark – Chips decompose slowly but may require nitrogen fertilizer application to avoid nutrient deficiency. Tend to wash down slopes over 6% and may clog inlet grates. Cover 2–3" in depth.
5. Mulches should not be applied if free surface water is present but may be applied to wet soil.

STANDARD SYMBOL

MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET

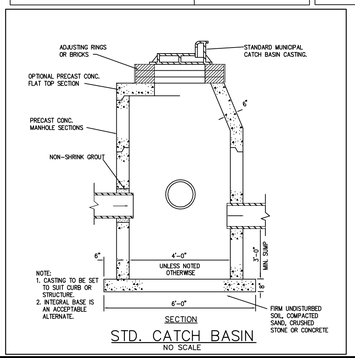
MULCHING SPECIFICATIONS (cont.) E6

How (cont.)
6. Mulches (particularly straw) may need anchoring. Common methods include crimping, disking, or punching into soil; covering with netting; spraying with a binder/tackifier, or keeping moist.
7. If using a tackifier to anchor mulch in place, apply immediately after mulch has been placed. Tackifiers include:
   Latex–Base. Mix 37 gallons of adhesive or the manufacturer's recommended rate with a minimum of 620 lbs. of recycled newsprint as a tracer with 925 gallons of water.
   Recycled Newsprint. Mix 1850 lbs. of newsprint with 3700 gallons of water.
   Wood Fiber. Mix 1850 lbs. of wood fiber with 3700 gallons of water.
   Guar Gum. Mix 120 lbs. of dry adhesive and a minimum of 620 lbs. recycled newsprint as a tracer with 3225 gallons of water.
   Other Tackifiers. Mix 240 lbs. of dry adhesive or the manufacturer's recommended rate and a minimum of 620 lbs. of recycled newsprint as a tracer with 3225 gallons of water.

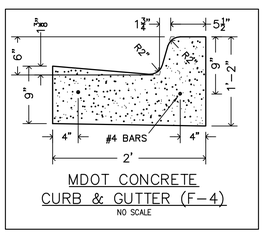
Maintenance
- Inspect mulched areas periodically and after any storm event. Repair damaged areas, reseed or replace vegetation (if necessary), and replace lost mulch immediately.
- Keep eroded soil, vehicular and pedestrian traffic, and concentrated runoff away from the mulched area.

Limitations
- Mulch can be blown or washed away if not secured.
- Organic mulches, particularly thick applications of wood chips, can reduce nitrogen availability to desired plants, may inhibit good surface coverage by vegetation, and should be supplemented with fertilizer.
- Tackifiers are slippery when wet. Equipment must be kept clean to prevent accidents.
- Tackifiers can mark vehicles, signs, or other objects if these items are not protected.
- Hay mulch should not be used, as it can contain noxious weeds.

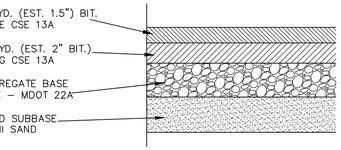
MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET



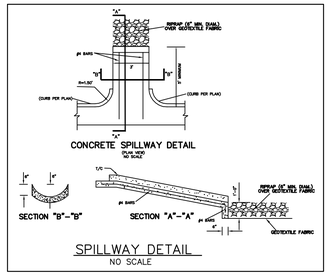
STD. CATCH BASIN
NO SCALE



MDOT CONCRETE CURB & GUTTER (F–4)
NO SCALE

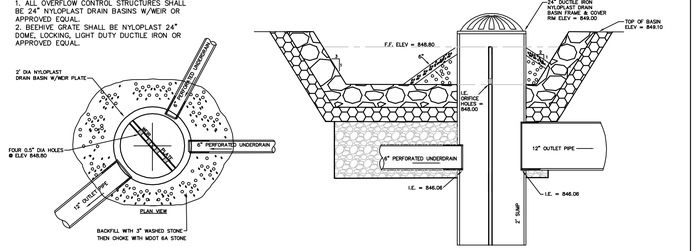


LIGHT DUTY ASPHALT PAVEMENT SECTION

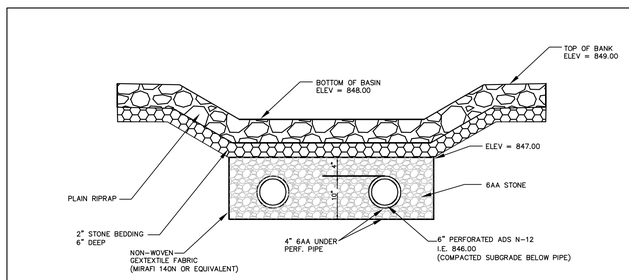


SPILLWAY DETAIL
NO SCALE

NOTES:
1. ALL OVERFLOW CONTROL STRUCTURES SHALL BE 24" NYLOPLAST DRAIN BASINS W/WEIR OR APPROVED EQUAL.
2. BEEHIVE GRATE SHALL BE NYLOPLAST 24" DOME LOOKING, LIGHT DUTY DUCTILE IRON OR APPROVED EQUAL.



OUTFLOW CONTROL STRUCTURE (OCS#1) FOR SEDIMENT BASIN
NO SCALE



CROSS SECTION OF SEDIMENT BASIN
NO SCALE

REVISIONS

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517–339–1014 FAX. 517–339–8047
Marshall Office
Ph. 269–781–9800

Wiswasser Park
Parking Lot & Drainage Upgrades
DETAIL SHEET

	DESIGNER: DCD	APPROVED BY: GAP
DATE: 3/31/23	PROJECT MGR. GAP	SHEET 3 OF 4
AUTHORIZED BY: BATH TOWNSHIP		JOB #: 100494

C:\Civil 3D Projects\Wiswasser\100494sheplan dwg, 3/31/2023 11:57:04 PM, PDF995

BENCHMARKS:

BENCHMARK #1 ELEV. = 850.70 (NAVD88)
FOUND RAILROAD SPIKE IN NORTH SIDE OF UTILITY POLE
±10' SOUTH OF EDGE OF ASPHALT OF PARK LAKE ROAD,
±8' WEST OF CONCRETE DRIVEWAY #15404 PARK LAKE RD.

BENCHMARK #2 ELEV. = 847.07 (NAVD88)
SET PK NAIL IN NORTHEAST SIDE OF UTILITY POLE
±15' SOUTH OF EDGE OF ASPHALT OF PARK LAKE ROAD,
±9' WEST OF BACK OF CURB OF PARK LAKE ROAD, ±265'
NORTHWEST OF DRIVEWAY

SEWER INVENTORIES

CATCH BASIN #100
RIM – 848.27
18" CMP NE – 845.66
18" HDPE S – 845.65
18" HDPE NW – 845.56

CATCH BASIN #101
RIM – 852.12
12" HDPE NW – 849.79

CATCH BASIN #102
RIM – 848.04
16" HDPE SE – 845.80
12" HDPE SE – 845.84
18" HDPE SW – 845.74
8" HDPE NE – 845.35
(FULL OF WATER)

CATCH BASIN #103
RIM – 848.44
12" HDPE SE – 846.06
16" HDPE NW – 846.10

CATCH BASIN #104
RIM – 847.46
8" HDPE SE – 846.36
6" CPP NW – 846.53

LAWN BASIN #105
RIM – 848.44
12" HDPE NW – 846.58
12" HDPE SW – 846.58

LAWN BASIN #106
RIM – 849.02
12" HDPE E – 846.77
12" HDPE W – 846.77

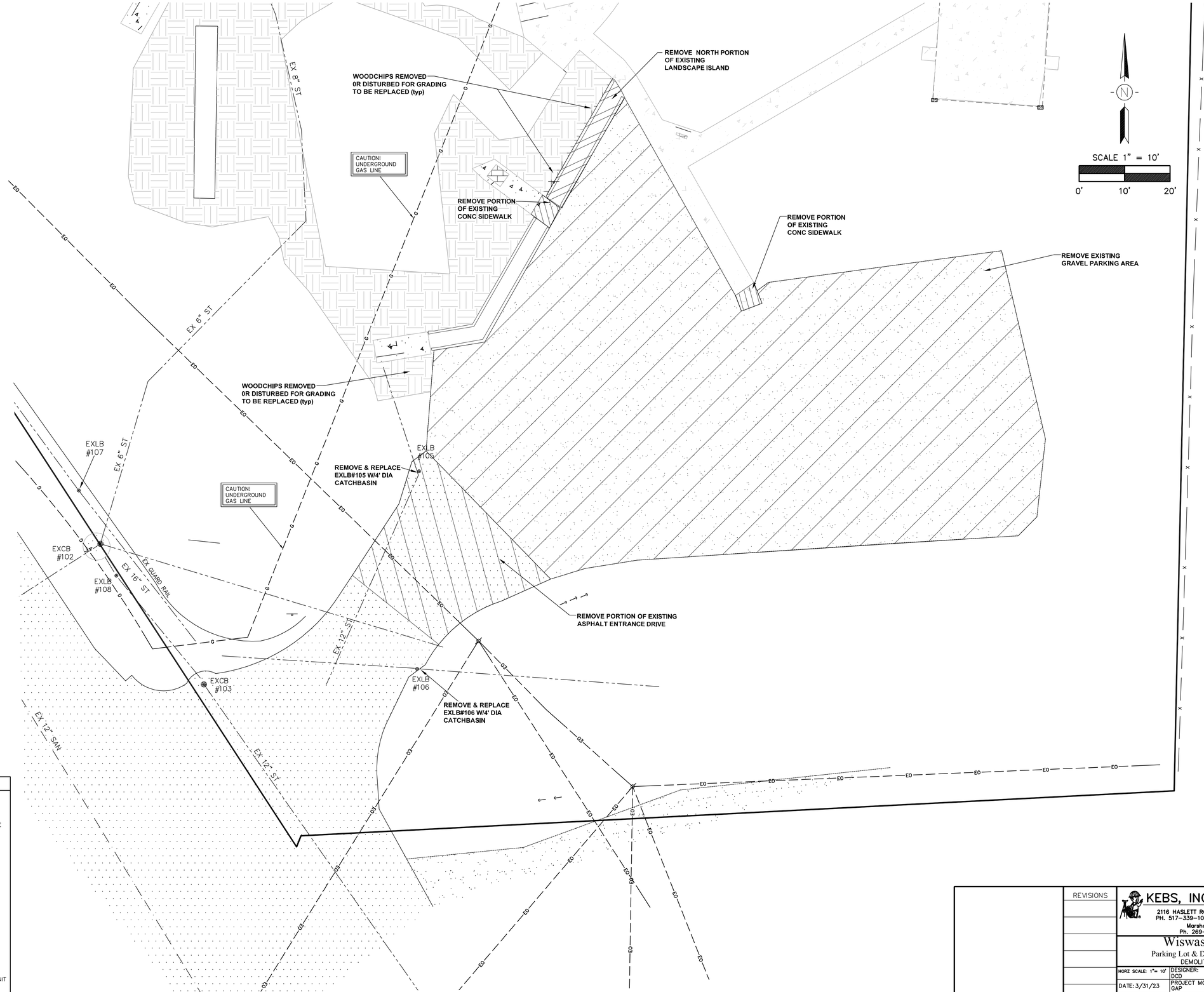
LAWN BASIN #107
RIM – 847.10
6" CPP NW – 845.90
6" CPP SE – 845.90

LAWN BASIN #108
RIM – 847.59
16" HDPE NW – 845.85
16" HDPE SE – 845.85

SANITARY MANHOLE #200
RIM – 848.30
12" VCP SE – 838.72
12" VCP NW – 838.65

SANITARY MANHOLE #201
RIM – 848.01
8" PVC NE – 842.67
12" VCP SE – 839.71
12" VCP NW – 839.66

SANITARY MANHOLE #202
RIM – 851.82
10" VCP NE – 840.48
10" VCP NE – 840.40
12" VCP S – 840.22
12" VCP NW – 840.15



EXISTING LEGEND

(M)	= MEASURED DISTANCE	S	= SANITARY MANHOLE
(R)	= RECORD DISTANCE	D	= DRAINAGE MANHOLE
●	= SET 1/2" BAR WITH CAP	E	= ELECTRIC MANHOLE
□	= FOUND IRON AS NOTED	T	= TELEPHONE MANHOLE
	= DEED LINE		= CATCHBASIN
	= DISTANCE NOT TO SCALE	o_{CO}	= SANITARY CLEANOUT
	= FENCE		= FIRE HYDRANT
	= ASPHALT		= VALVE
	= CONCRETE		= UTILITY POLE
	= GRAVEL		= LIGHT POLE
880	= EXISTING CONTOUR ELEVATION		= GUY POLE
OHW	= BUILDING OVERHANG		= GUY WIRE
EX SAN	= SANITARY SEWER		= UTILITY PEDESTAL
EX ST	= STORM SEWER		= TRANSFORMER
EX W	= WATER LINE		= HANDHOLE
G	= GAS LINE		= ELECTRIC METER
TU	= UNDERGROUND TELEPHONE		= GAS METER
C	= UNDERGROUND TELEVISION		= WATER METER
EU	= UNDERGROUND ELECTRIC		= SIGN
EO	= OVERHEAD WIRES		= POST
	= EDGE OF WOODS		= AIR CONDITIONING UNIT
	= DECIDUOUS TREE		
	= CONIFEROUS TREE		

REVISIONS

KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
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Wiswasser Park
Parking Lot & Drainage Upgrades
DEMOLITION PLAN

HORZ SCALE: 1"= 10'	DESIGNER: DCD	APPROVED BY: GAP
DATE: 3/31/23	PROJECT MGR. GAP	SHEET 4 OF 4
AUTHORIZED BY: BATH TOWNSHIP		JOB #: 100494

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