Total Safe Space Storage
Development Impact Statement

Multiple Tenant Buildings with Outdoor RV, Boat, and Trailer Storage

16.20 Acres, Part of Section 22
Washington Township, Michigan

Prepared by:

URBAN LAND CONSULTANTS

CIVIL ENGINEERS PLANNERS LAND SURVEYORS GPS CONSULTANTS

8800 23 Mile Road
Shelby Township, Michigan 48316
Phone: (586) 731-8030
e-mail: info@urban-land.com

December 12, 2023

DEVELOPMENT IMPACT STATEMENT

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Exhibits: **A** shows a location map, **B** is the aerial view, **C** shows zoning and land use, **D** shows soil types, and **E** is the wetlands information.

1. Existing Conditions

A) *Streams, Bodies of Water & Flood Plain*

There is no floodplain on the property. The Existing Topographical Survey shows an unnamed drainage ditch flowing west to east along the southern edge of the property. A storm detention basin was constructed in the southwest corner of the site in 1988 as part of the golf driving range construction. Some standing water is present in the basin and discharges to the on-site drainage ditch. Refer to the **Existing Conditions Plan.**

B) *Soil Types & Conditions*

The soil types are graphically depicted on the appended **Exhibit D**.
According to the Macomb County Soil Survey, the site consists of Gilford sandy loam, Lupton Muck, and Tawas Muck. A **Soils Investigation** performed by McDowell & Associates on August 1, 2022, is attached. The 4 boring locations have 5'6" to 8' of medium compact to extremely compact fine sand fill including foundry sand. The site shows some signs of modification which could indicate fill and soil conditions different from those encountered at the boring locations.

C) *Topography & Ground Water Table*

As is consistent with a golf driving range, the site is generally flat in nature. There is approximately 15' of fall from the existing west entrance and parking to southeast corner of the site, which is the lowest area on the property. Refer to the **Existing Conditions Plan** for site topography. Groundwater elevation is assumed to vary with ground elevation. Refer to a **Soils Investigation** performed by McDowell & Associates for the ground water level encountered at the 4 boring locations on site.

D) *Woodlands and Vegetation*

Refer also to **Exhibit B** to review an aerial photograph of the site. As a golf driving range, most of the site is maintained as an open grass field with trees along the perimeter of the site. The buildings and parking areas are outside the wooded areas. Trees in the regulated forested wetlands area around the perimeter of the site will remain.

E) *Wetlands*

One wetland area was flagged by ASTI Environmental on March 23, 2022, along the perimeter of the property, and located in the field by Urban Land Consultants on May 3, 2022. Several areas of Wetland Area A are off-site including flags A33-A46 along the east property line, and A48-A49, A62-A65 along the north property line. All 0.852 acres of on-site wetland areas will be left undisturbed. A variance has been approved to disturb up to 10 feet of the 25 foot wetland buffer. The uplands, where the buildings and parking are proposed, have no apparent wetlands and there shall be no impacts to wetlands. See **Exhibit E,** the **Existing Conditions Plan**, and the **Site Plan**.

F) *Existing Utilities & Facilities*

Refer to the **Site Plan Proposed Golf Driving Range** for the previously approved site plan for the existing driving range and the **Existing Conditions Plan** for the size, type, and location of the public and private utilities serving the site. Electrical, gas, and telephone are available on site. The existing driving range is served by on-site septic and well. Existing storm water outlets to an on-site detention pond, and then discharge to the ditch along the southern property line.

Impact Assessment

1. Land Use Impact

A) *Brief Description of the Proposed Land Use*

The site is zoned and master planned as IND. See **Exhibit C**. The developer is petitioning to redevelop the site with two Multiple Tenant Buildings with a Special Land Use for Outside Storage or RVs, Boats, and Trailers. Refer to the **Site Plan.**

B) *Hours of Operation, if applicable*

The storage facility and outdoor storage will be available 24 hours a day, 7 days a week via key card or code. Building hours will vary based on the need of the individual tenants.

C) *Identify whether the proposed use will create dust, noise, odor, or glare that may impact abutting property.*

Dust will not be an issue once construction is complete. No unusual odor would be produced by this development. Noise typical of a storage facility would be expected and would be less than the sound produced by the M-53 Freeway bordering the east and Van Dyke Road bordering the west. Any lighting will be down cast and shielded from the abutting parcels with a ground level illumination of zero at the property lines. Glare from car headlights should not affect neighboring properties consisting of an industrial building to the south with regulated forested wetlands on the shared property line, M-53/MDOT property to the east also with regulated forested wetlands along the property line, and a landscape material processing site to the north, again with regulated forested wetland on the shared property line. The

non-conforming residential house two parcels to the north along Van Dyke Road will be screened from lights by the existing regulated forested wetland trees, brush, and shrubs and the proposed fencing.

D) *Project Phasing Plan Schedule*

Phase 1 will consist of constructing the outside storage area, the drive aisle from the existing entrance from Van Dyke to the outside storage area, Detention Pond #2 in the southeast corner of the site, and temporary berms where Buildings #1 and #2 will be built. The berms will be used to screen the storage from Van Dyke until the building are built during Phase 2 & 3. Phase 2 will consist of constructing Building #1 and #2, the parking lots, and reshaping Pond #1. The build-out for all buildings and construction will depend on economic conditions and estimated to take 5 years.

E) *Describe How Existing Natural Features Will Be Preserved*

Currently, the site is maintained as a large grass field without any significant natural features present. The site layout has been designed to leave all on-site wetlands undisturbed. Most of the perimeter woodlands will remain due to the Township's required 25' natural features buffer. A variance to disrupt up to 10' of the 25' required buffer has been approved. The proposed utilities in the Van Dyke Road Right-of-Way have a potential to disrupt the 0.125-acre (5,428 s.f.) area between flags A1-A3, an EGLE permit will be required. Utilizing a bore and jack system during the installation of the utilities will minimize the disruption.

F) *Describe Any Impact on Ground Water Quality or Quantity*

We do not anticipate any impact on the ground water quality or quantity.

2. <u>Impact on Public Utilities</u>

A) *Describe how the site will be provided with water and sanitary sewer facilities, including the adequacy of the existing public utility system to accommodate the proposed new development.*

Public water is available from 28 Mile Road, and it is expected to be extended to the site with adequate volumes for domestic use and fire protection. A 10" sanitary sewer extends approximately 300' northeast from 28 Mile Road along the Van Dyke frontage of the parcel to the south. It is expected to be extended by an additional 550' to reach this parcel and has the capacity to handle the proposed development.

B) *General calculations for water flows and water demands and how they relate to sewer line capacity.*

The water and sewer design are being completed by the Township's engineering firm, Giffels Webster.

C) *Describe the methods to be used to control storm water drainage from the site. This shall include a description of measures to control soil erosion and sedimentation during construction.*

The west part of the site consisting of the existing parking lot, golf shack, and tee box area drain to the existing detention pond in the southwest corner of the site and will continue to function as is during Phase 1. The remaining site drains southeasterly to the existing on-site ditch along the southern boundary line. As part of Phase 1, the redesigned site will control storm water by way of sheet flow into Sediment Forebays, connected by enclosed pipe to the proposed Detention Pond #2, then outletting to the existing on-site ditch along the southern boundary line. During Phase 2, the existing detention pond will be reshaped to have adequate capacity for storm water runoff for Phase 2. The two ponds and sediment forebays provide significant water quality treatment before the water eventually discharges to the on-site ditch. Any fertilizers or grass treatments that flowed directly into the wetlands, will now be directed into forebays, catch basins, and the ponds, essentially eliminating direct runoff to the wetlands. Temporary soil erosion and sedimentation control devices will be used throughout construction and maintained until the project is complete. Erosion control measures will include silt fencing, rip rap and inlet wraps. Both a Macomb County Soil Erosion permit and a State/Federal NPDES permit are expected.

3. Impact on Public Services

Describe the number of expected residents, employees, visitors or patrons, and the anticipated impact of public schools, police protection and fire protection.

We expect approximately 30 employees for each of the multi-tenant buildings (60 employees total for the site. Residents from the surrounding community are expected to patronize the outdoor storage area for their large vehicle and trailer parking needs.

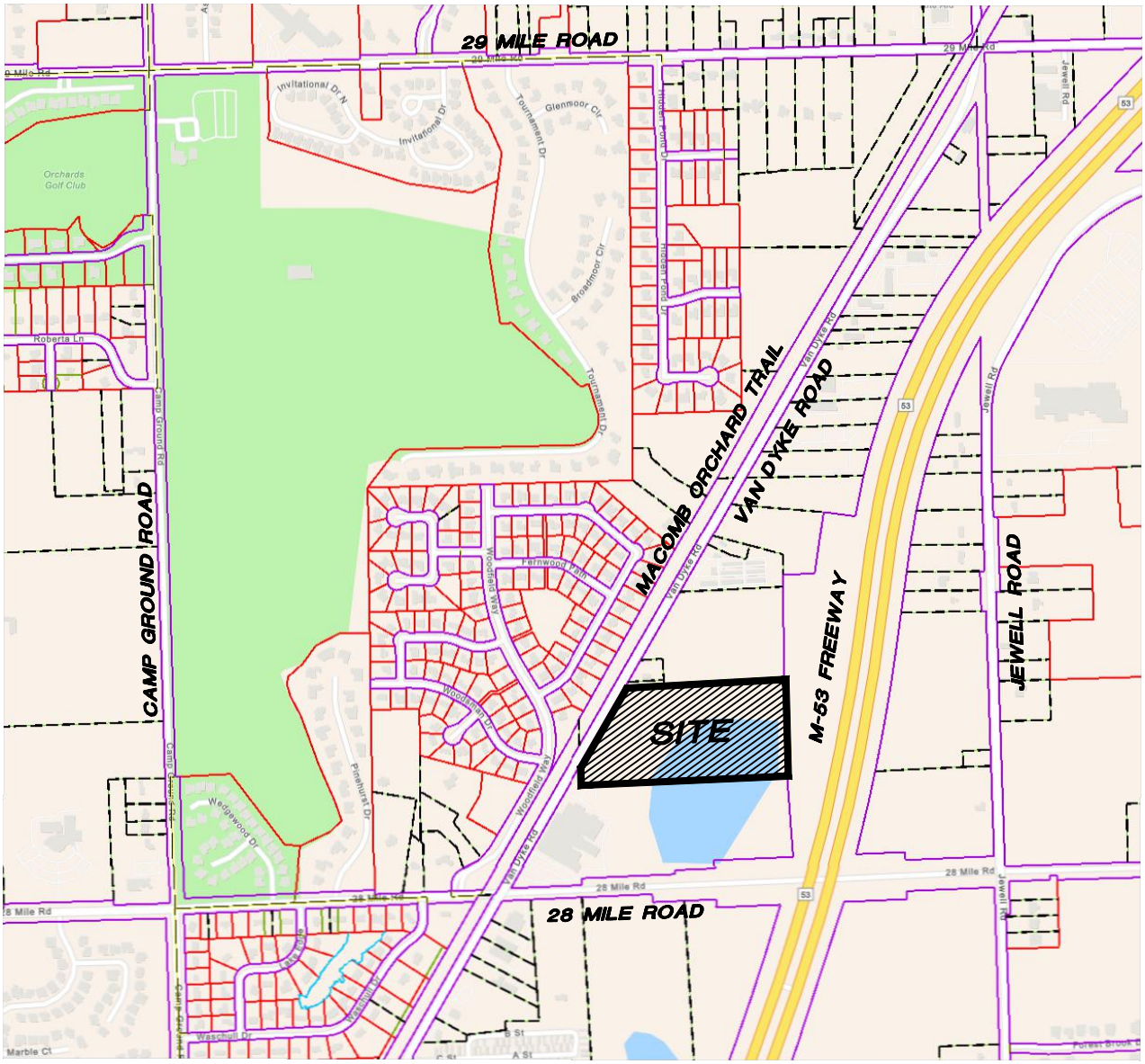
As a storage facility, there is no expected direct increase in local school attendance. Certainly though, the development will produce additional property tax revenue, some of which will benefit the local schools.

This development will be no more impactful on police and fire protection resources than similar existing developments. Township services should be adequate to handle fire and police protections for the proposed development. The nearest fire department is 1.75 miles to the west, the other township fire department is 2 miles to the south. With the water main extension to the site and on-site water main for a hydrant, the fire department will have an increased ability to handle an on-site fire.

4. Traffic Impact Analysis

The existing golf range is seasonal in nature, with little to no traffic in the winter. The existing site has 70 parking spaces including 1 accessible space.

Phase 1 of the proposed project has 421 parking spaces for recreation vehicles, boats, and trailers. Building 1 has 50 parking spaces including 2 accessible parking spaces and Building 2 has 49 parking spaces including 2 accessible parking spaces. We expect a decrease in overall traffic from the existing site design to the proposed storage facility and request that a traffic study be waived for the proposed development.



NORTH

SCALE: 1" = 1000'

0 250 500 1000 1500 2000 2500
(FEET)

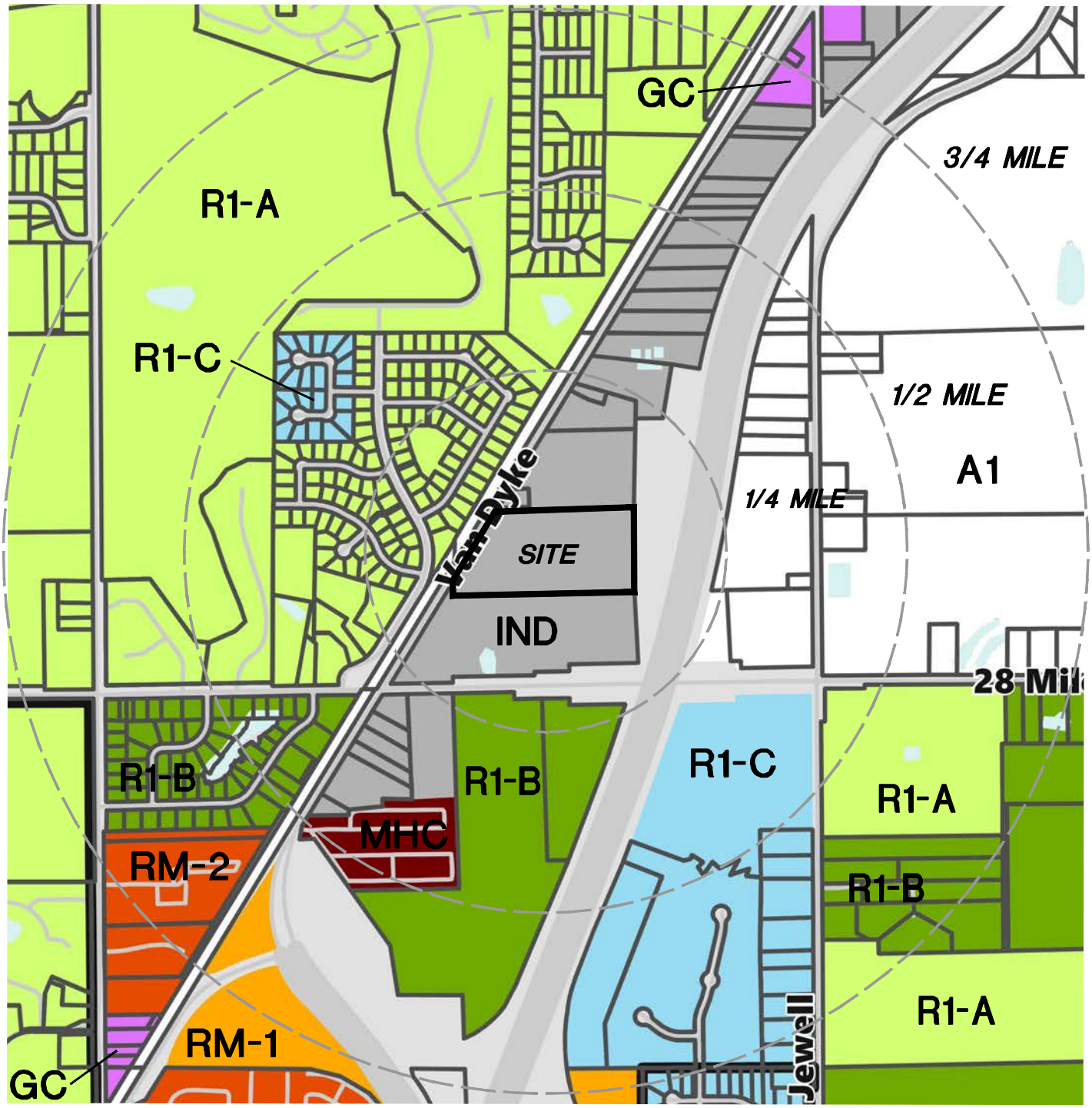
EXHIBIT A
LOCATION MAP

PART OF THE S.E. 1/4 OF SECTION 22
T.4N., R.12E., WASHINGTON TOWNSHIP
MACOMB COUNTY, MICHIGAN

NORTH

EXHIBIT B
AERIAL MAP

PART OF THE S.E. 1/4 OF SECTION 22
T.4N., R.12E., WASHINGTON TOWNSHIP
MACOMB COUNTY, MICHIGAN



NORTH

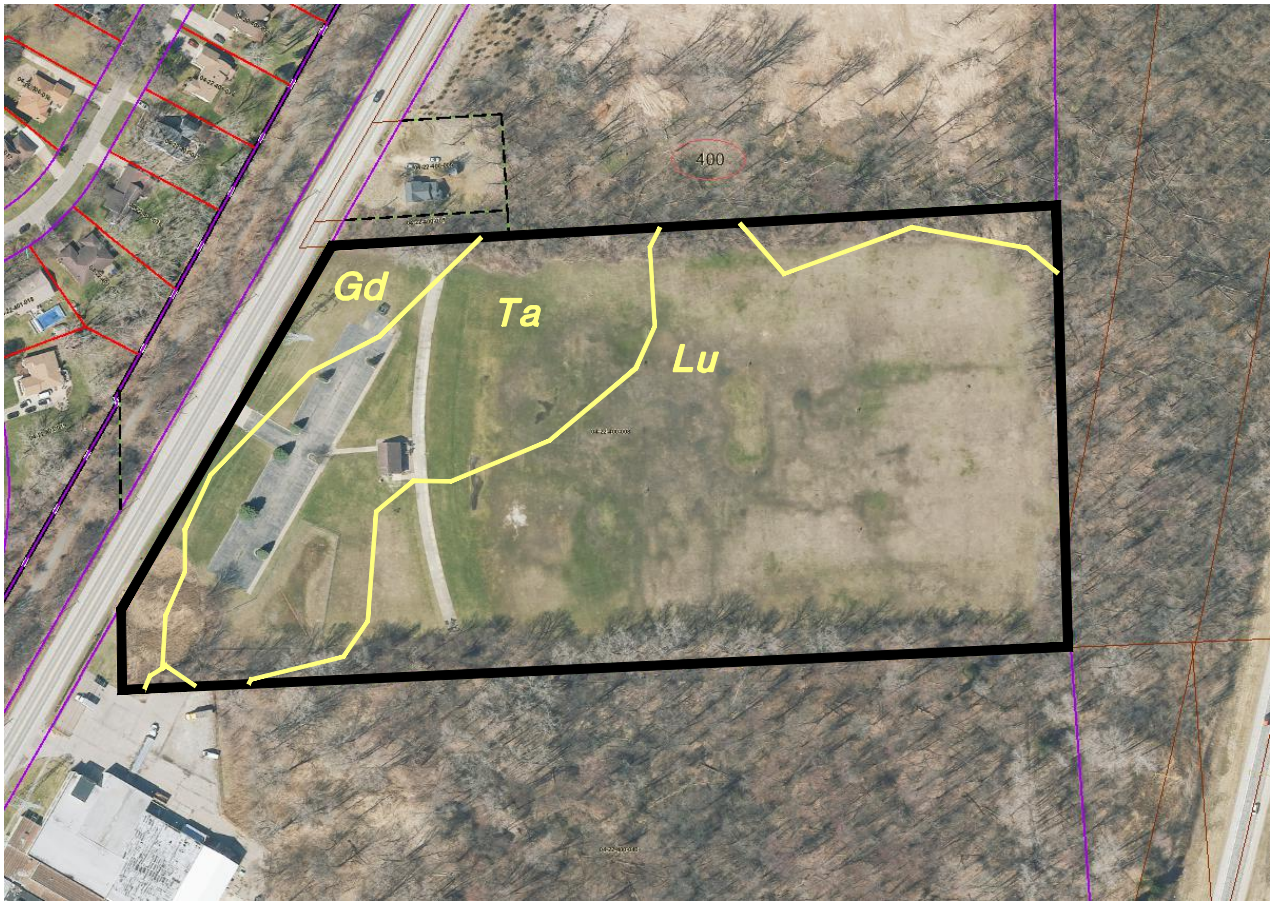
EXHIBIT C
ZONING and LAND USE MAP

PART OF THE S.E. 1/4 OF SECTION 22
T.4N., R.12E., WASHINGTON TOWNSHIP
MACOMB COUNTY, MICHIGAN

SCALE: 1" = 1000'

0 250 500 1000 1500 2000 2500
(FEET)

IND	GENERAL INDUSTRIAL	
GC	GENERAL COMMECIAL	
RM-1	MULTIPLE FAMILY RESIDENTIAL	
RM-2	MULTIPLE FAMILY RESIDENTIAL	
MHC	MANUFACTURED HOUSING COMMUNITY	
R1-A	SINGLE FAMILY RESIDENTIAL	
R1-B	SINGLE FAMILY RESIDENTIAL	
R1-C	SINGLE FAMILY RESIDENTIAL	
A1	AGRICULTURAL RESIDENTIAL	



SOILS

Gd — GILFORD SANDY LOAM
0"–10" VERY DARK GRAY SANDY LOAM, 10"–14" GRAY SANDY LOAM, 14"–30" GRAYISH BROWN GRAVELY SANDY LOAM, 30"–50" LIGHT GRAY GRAVELY SAND. MODERATELY RAPID TO RAPID PERMEABILITY, VERY SLOW OR PONDED RUNOFF. HIGH WATER TABLE.

Lu — LUPTON MUCK (0 TO 2% SLOPES)
0"–8" VERY DARK BROWN MUCK, 32"–54" VERY DARK BROWN PEATY MUCK, 54"–60" DARK BROWN FIBROUS PEAT. VERY HIGH AVAILABLE MOISTURE CAPACITY, RUNOFF IS VERY SLOW, RAPID PERMEABILITY.

Ta — TAWAS MUCK (0 TO 2% SLOPES)
0"–18" BLACK MUCK, 18"–60" GRAY SAND. RAPID PERMEABILITY IN ARTIFICIALLY DRAINED AREAS. WATER TABLE NEAR THE SURFACE IN UNDRAINED.

NORTH

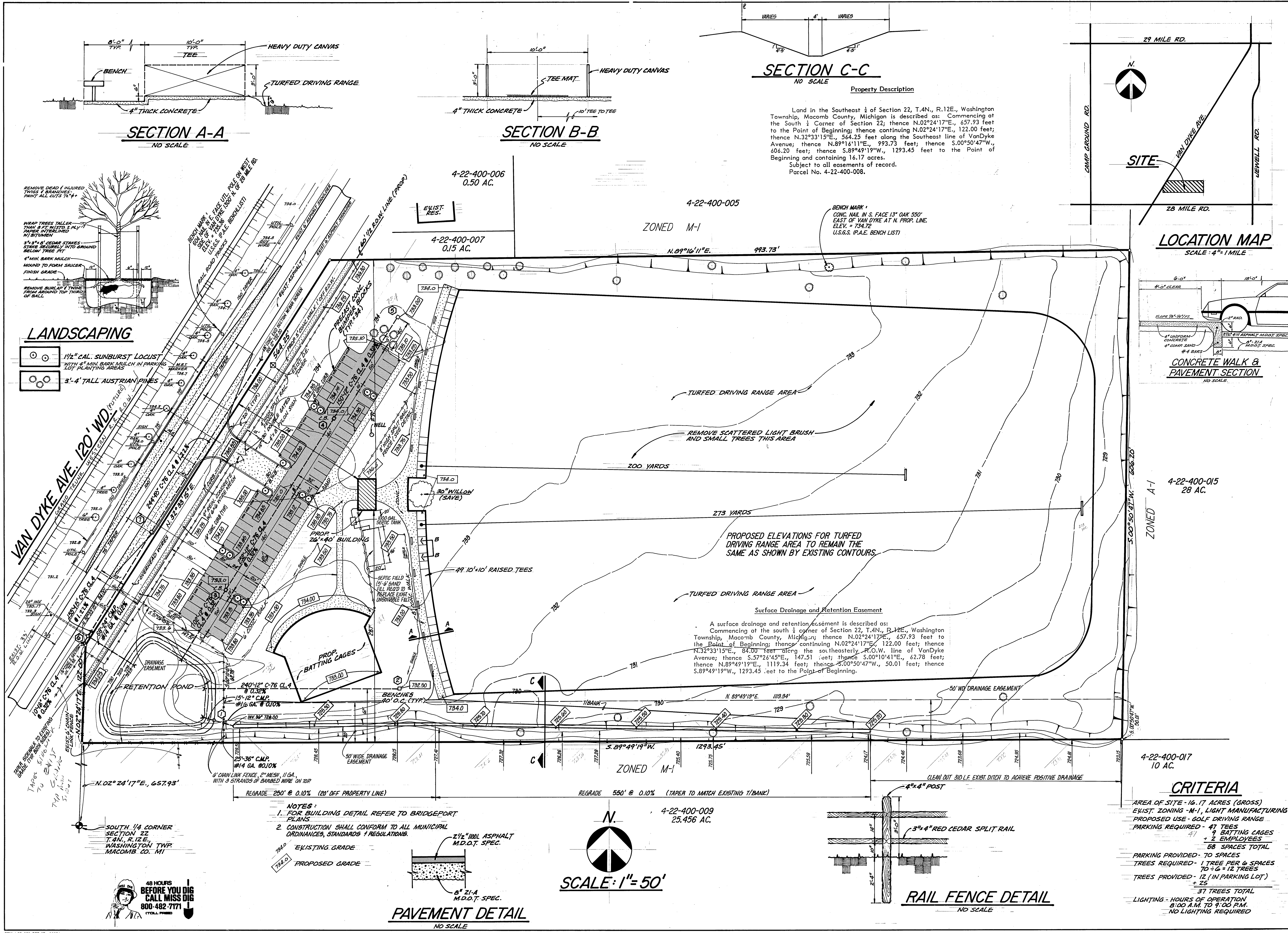
EXHIBIT D
EXISTING SITE CONDITIONS AND SOILS

PART OF THE S.E. 1/4 OF SECTION 22
T.4N., R.12E., WASHINGTON TOWNSHIP
MACOMB COUNTY, MICHIGAN

NORTH

EXHIBIT E
WETLANDS INVENTORY MAP

PART OF THE S.E. 1/4 OF SECTION 22
T.4N., R.12E., WASHINGTON TOWNSHIP
MACOMB COUNTY, MICHIGAN



SECTION A-A
NO SCALE
BENCH
HEAVY DUTY CANVAS
TURFED DRIVING RANGE
4" THICK CONCRETE
SECTION B-B
NO SCALE
TEE MAT
10' TEE TO TEE
SECTION C-C
NO SCALE
VARIES
LANDSCAPING
1½" CAL. SUNBURST LOCUST WITH 4" MIN. BARK MULCH IN PARKING LOT PLANTING AREAS
3'-4' TALL AUSTRIAN PINES
VAN DYKE AVE. 120' WD.
GRAND TRUNK WESTERN R.R.
4-22-400-006
0.50 AC.
4-22-400-007
0.15 AC.
4-22-400-005
ZONED M-I
N.89°16'11"E. 993.73'
TURFED DRIVING RANGE AREA
REMOVE SCATTERED LIGHT BRUSH AND SMALL TREES THIS AREA
200 YARDS
273 YARDS
PROPOSED ELEVATIONS FOR TURFED DRIVING RANGE AREA TO REMAIN THE SAME AS SHOWN BY EXISTING CONTOURS
30" WILLOW (SAVE)
PROP. 26'x40' BUILDING
49 10'x10' RAISED TEES
PROP. BATTING CAGES
RETENTION POND
DRAINAGE EASEMENT
BENCHES 10' O.C. (TYP.)
50' WD. DRAINAGE EASEMENT
N. 89°49'19"E. 1119.34'
S. 89°49'19"W. 1293.45'
S.00°50'47"W. 606.20'
N.02°24'17"E. 122.00'
N.02°24'17"E., 657.93'
ZONED M-I
ZONED A-1
4-22-400-015
28 AC.
4-22-400-009
25.456 AC.
4-22-400-017
10 AC.
SOUTH 1/4 CORNER SECTION 22 T.4N., R.12E. WASHINGTON TWP. MACOMB CO. MI
BENCH MARK: CONC. NAIL IN S. FACE 13" OAK 550' EAST OF VAN DYKE AT N. PROP. LINE. ELEV. = 734.72 U.S.G.S. (P.A.E. BENCH LIST)
CLEAN OUT 310 L.F. EXIST. DITCH TO ACHIEVE POSITIVE DRAINAGE
REGRADE 250' @ 0.10% (20' OFF PROPERTY LINE)
REGRADE 550' @ 0.10% (TAPER TO MATCH EXISTING T/BANK)
LOCATION MAP
SCALE: 4"= 1 MILE
29 MILE RD.
28 MILE RD.
CAMP GROUND RD.
JEWELL RD.
VAN DYKE AVE.
SITE
CONCRETE WALK & PAVEMENT SECTION
NO SCALE
PAVEMENT DETAIL
NO SCALE
2½" 1100L ASPHALT M.D.O.T. SPEC.
8" 21-A M.D.O.T. SPEC.
RAIL FENCE DETAIL
NO SCALE
4"x4" POST
3"x4" RED CEDAR SPLIT RAIL
SCALE: 1"=50'
48 HOURS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

Property Description

Land in the Southeast ¼ of Section 22, T.4N., R.12E., Washington Township, Macomb County, Michigan is described as: Commencing at the South ¼ Corner of Section 22; thence N.02°24'17"E., 657.93 feet to the Point of Beginning; thence continuing N.02°24'17"E., 122.00 feet; thence N.32°33'15"E., 564.25 feet along the Southeast line of VanDyke Avenue; thence N.89°16'11"E., 993.73 feet; thence S.00°50'47"W., 606.20 feet; thence S.89°49'19"W., 1293.45 feet to the Point of Beginning and containing 16.17 acres.

Subject to all easements of record.

Parcel No. 4-22-400-008.

Surface Drainage and Retention Easement

A surface drainage and retention easement is described as:

Commencing at the south ¼ corner of Section 22, T.4N., R.12E., Washington Township, Macomb County, Michigan; thence N.02°24'17"E., 657.93 feet to the Point of Beginning; thence continuing N.02°24'17"E., 122.00 feet; thence N.32°33'15"E., 84.00 feet along the southeasterly R.O.W. line of VanDyke Avenue; thence S.57°26'45"E., 147.51 feet; thence S.00°10'41"E., 62.78 feet; thence N.89°49'19"E., 1119.34 feet; thence S.00°50'47"W., 50.01 feet; thence S.89°49'19"W., 1293.45 feet to the Point of Beginning.

NOTES:

1. FOR BUILDING DETAIL REFER TO BRIDGEPORT PLANS
2. CONSTRUCTION SHALL CONFORM TO ALL MUNICIPAL ORDINANCES, STANDARDS & REGULATIONS.

EXISTING GRADE

PROPOSED GRADE

CRITERIA

AREA OF SITE - 16.17 ACRES (GROSS)
EXIST. ZONING - M-1, LIGHT MANUFACTURING
PROPOSED USE - GOLF DRIVING RANGE
PARKING REQUIRED - 47 TEES
9 BATTING CAGES
+ 2 EMPLOYEES
58 SPACES TOTAL
PARKING PROVIDED - 70 SPACES
TREES REQUIRED - 1 TREE PER 6 SPACES
70 ÷ 6 = 12 TREES
TREES PROVIDED - 12 (IN PARKING LOT)
+ 25
37 TREES TOTAL
LIGHTING - HOURS OF OPERATION
8:00 A.M. TO 9:00 P.M.
NO LIGHTING REQUIRED

SITE PLAN PROPOSED GOLF DRIVING RANGE

PART OF SEC. 22, T.3N., R.12E., WASHINGTON TWP., MACOMB CO., MI

SHEET NO. 1 OF 4

DATE	ADDITIONS AND/OR REVISIONS
9-24-88	REVISED PER TWP. & M.D.O.T.
7-18-88	REVISED PER M.D.O.T.
7-15-88	SUBMITTED FOR ENGINEERING APPROVAL
5-10-88	REVISED PER PLANNING COMMISSION
4-20-88	REVISED PER PLANNING COMMISSION
3-25-88	REVISED

JOB NO. 880223-2938
DATE 3.24.88
SCALE 1"=50'
DRAWN BELL
CHECK
FIELD BOOK

URBAN LAND CONSULTANTS
CIVIL ENGINEERS • PLANNERS • LAND SURVEYORS
8800 23 MILE ROAD UTICA, MI. 48087
313 731-8030

PRM, 1-87, 250, DPD-3D 90874

880223-2938

ASTI ENVIRONMENTAL

Assessment • Remediation • Compliance
Restoration • Incentives

10448 Citation Drive, Suite 100
Brighton, MI 48116

Mailing Address:
P.O. Box 2160
Brighton, MI 48116-2160

800 395-ASTI
Fax: 810.225.3800

www.asti-env.com

Sent Via Email Only

March 24, 2022

Mr. Sam Jaskiewicz
S & V Companies
61800 Van Dyke Road
Washington Township, MI 48094

RE: Wetland Delineation and Jurisdictional Assessment
Royal Tee Golf Range
61400 Van Dyke Road
Washington Township, Macomb County, Michigan
ASTI File No. 12307

Dear Mr. Jaskiewicz:

A site investigation was completed on March 23, 2022 by ASTI Environmental (ASTI) to delineate wetland boundaries within the above-referenced property located at 61400 Van Dyke Avenue, Washington Township, Macomb County, Michigan (Property). One watercourse and one wetland likely regulated by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) were found on the Property (Figure 1 – *GPS-Surveyed Wetland Boundaries*). Wetland boundaries, as depicted on Figure 1, were located using a professional grade, hand-held Global Positioning System unit (GPS).

SUPPORTING DATA

The USDA Web Soil Survey (WSS), the National Wetland Inventory Map (NWI), the EGLE Wetlands Map Viewer web site, and digital aerial photographs were all used to support the wetland delineation and subsequent regulatory status determination. The EGLE map indicated wetland and wetland soils throughout the majority of the Property. The NWI map indicated the presence of wetland in the extreme southern and eastern portions of the Property.

The WSS indicates the Property is comprised of the soil complexes of Gilford loamy sand, Lupton muck, and Timakwa muck. According to the WSS, all three of these soils are hydric soils.

FINDINGS

ASTI investigated the Property for the presence of lakes, ponds, wetlands, and watercourses. This work is based on MCL 324 Part 301, Inland Lakes and Streams and Part 303, Wetlands Protection. The delineation protocol used by ASTI for this delineation is based on the US Army Corps of Engineers' *Wetland Delineation Manual,* 1987, the *Regional Supplement to the Corps of Engineer Wetland Delineation Manual: Northcentral/Northeast Region*, and related guidance/documents, as appropriate. Wetland vegetation, hydrology, and soils were used to locate the wetland boundaries.

One watercourse and one wetland were found on the Property and are discussed below.

Watercourse

A watercourse is located along the southern boundary of the Property. Water originates from within an adjacent wetland, flows from west to east, and continues off-site to the south. The watercourse meets the definition of a stream: a defined bed and banks with evidence of flow. It is ASTI's opinion that this stream is regulated by EGLE under Part 301, Inland Lakes and Streams. ASTI identified the ordinary high-water marks at a number of locations along the channel (Figure 1).

Wetland A

Wetland A is a combination of emergent and forested wetland 1.32 acres in size on the Property (Figure 1). Vegetation within the emergent portion of Wetland A was dominated by common reed (*Phragmites australis*). Dominant vegetation within the forested portion included ash (*Fraxinus nigra, Fraxinus pennsylvanica*), spicebush (*Lindera benzoin*), red maple (*Acer rubrum*) and eastern cottonwood (*Populus deltoides*). Soils within Wetland A were comprised of muck or loam and are considered hydric because the criteria for depleted matrix and depleted below dark surface were met. Indicators of wetland hydrology observed within Wetland A included surface water, geomorphic position, iron deposits, and water-stained leaves. This wetland continues off-site to the north, south, and east.

The adjacent upland is an existing maintained golf range with an upland scrub-shrub fringe. Dominant vegetation within the upland included Kentucky blue grass (*Poa pratensis*), honeysuckle (*Lonicera tatarica*), dogwood (*Cornus racemosa*), and black cherry (*Prunus serotina*). Soils in the adjacent upland were comprised of loams that did not exhibit hydric soils characteristics. No indicators of wetland hydrology were observed.

It is ASTI's opinion that Wetland A is regulated by EGLE under Part 303 because it is contiguous with (directly connected to) the regulated stream on the Property. In addition, this wetland appears to be greater than five acres in size, including off-site portions. This size is based off of aerial photograph interpretation.

Retention Basin

Review of site plans provided by Urban Land Consultants indicates that a retention basin required for treating stormwater was constructed in the southwest corner of the Property in or around 1988. At the time of the field investigation, some standing water was present in the basin. The basin culvert discharges to the adjacent watercourse.

Per 4(b) of Part 303, a wetland that is incidentally created as a result of the construction and operation of a water treatment pond, lagoon, or storm water facility in compliance with the requirements of state or federal water pollution control laws is not subject to regulation. As a result, it is ASTI's opinion that this retention basin is not regulated by EGLE.

Wetland Flagging

Wetland boundaries were marked in the field with day-glo pink and black striped flagging and numbered as A-1 through A-65.

All flagging on-site was located in the field by ASTI using a professional-grade, hand-held GPS unit.

SUMMARY

Based upon the data, criteria, and evidence noted above, it is ASTI's professional opinion the Property includes one watercourse and one wetland (Wetland A) regulated by EGLE under the Natural Resources and Environmental Protection Act (1994 P.A. 451), Part 301, Inland Lakes and Streams, and Part 303, Wetland Protection, respectively. Additionally, the constructed retention basin is exempt from EGLE regulation. However, EGLE has the final authority on the extent of regulated wetlands, lakes, and streams in the State of Michigan. Any proposed impact to the areas that ASTI has identified as regulated will require an EGLE permit and ASTI recommends EGLE verification of wetland regulatory status of any wetlands that ASTI deems non-regulated, prior to any wetland impacts.

Attached are Figure 1, which shows the locations of wetland flagging on the Property, and completed US Army Corps of Engineers (ACOE) Wetland Data Forms.

Thank you for the opportunity to assist you with this project. Please let us know if we can be of any further assistance in moving your project forward.

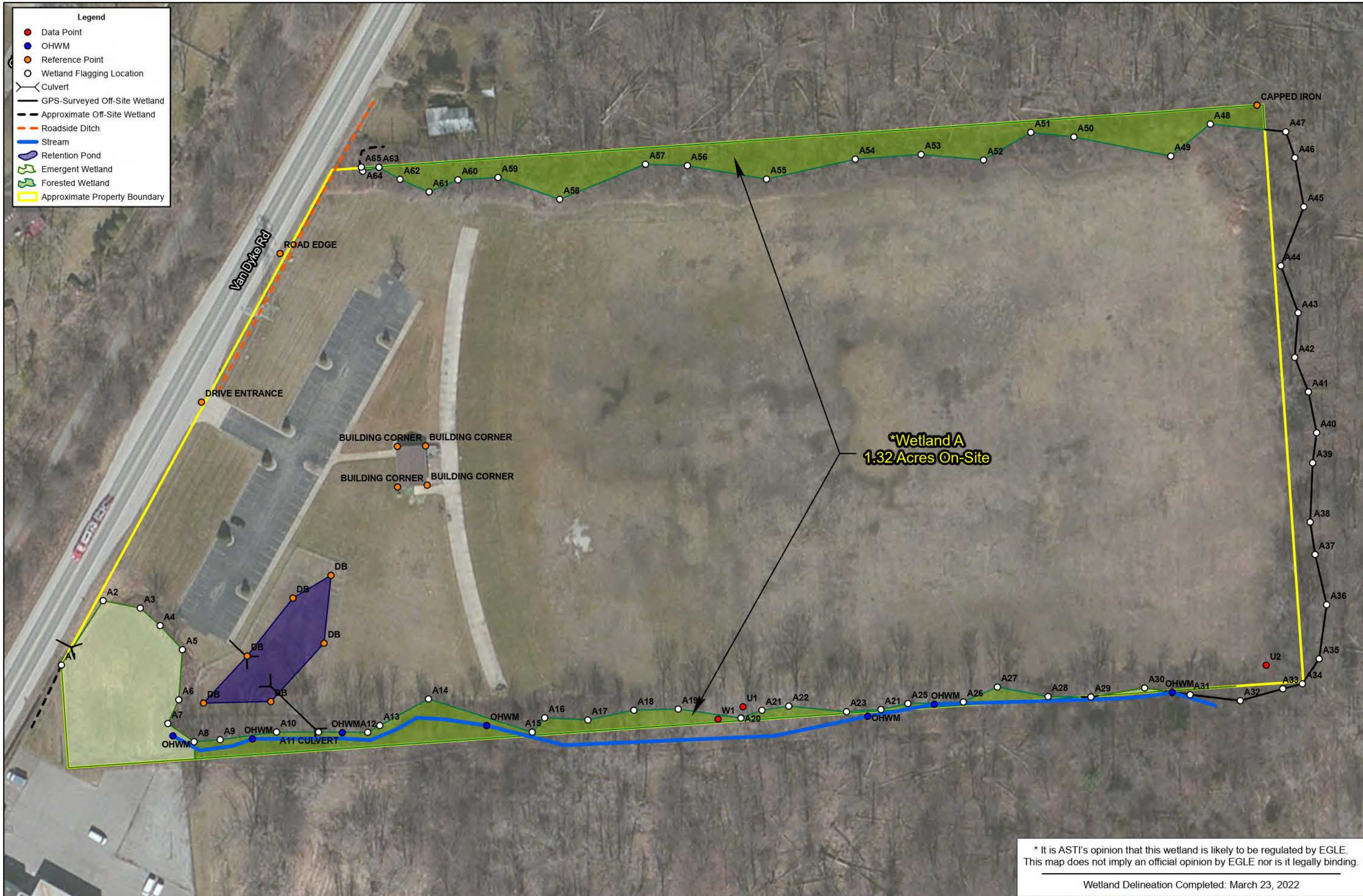
Cordially,

ASTI ENVIRONMENTAL

Brad Kassuba, CWB, PWS
Wetland Ecologist
Professional Wetland Scientist #1330

Dana R. Knox, PWS
Wetland Ecologist
Professional Wetland Scientist #213

Attachments: Figure 1 – *GPS-Surveyed Wetland Boundaries*
Completed ACOE Wetland Data Forms



ASTI Environmental

Figure 1 - GPS-Surveyed Wetland Boundaries

Washington Township, MI

Royal Tee Driving Range

Client: S & V Companies LLC
Created by: RMH, March 25, 2022, ASTI Project 12307
Imagery: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 61400 Van Dyke Avenue City/County: Macomb County Sampling Date: 3/23/22

Applicant/Owner: S&V Companies State: MI Sampling Point: U1

Investigator(s): ASTI Environmental - Brad Kassuba Section, Township, Range: Section 22, T04N, R12E

Landform (hillside, terrace, etc.): top of slope Local relief (concave, convex, none): concave Slope %: ____

Subregion (LRR or MLRA): LRR L Lat: ____ Long: ____ Datum: ____

Soil Map Unit Name: Lupton muck NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Soil pit appears to contain some old fill soil/gravel.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: U1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	20	Yes	FAC
2. *Prunus serotina*	20	Yes	FACU
3. *Ulmus americana*	15	Yes	FACW
4.			
5.			
6.			
7.			
	55	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Cornus racemosa*	30	Yes	FAC
2. *Frangula alnus*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	40	=Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. *Parthenocissus quinquefolia*	5	Yes	FACU
2.			
3.			
4.			
	5	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	60	x 3 =	180
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	100 (A)		310 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point U1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/3	100			C	M	Loamy/Clayey	
6-18	10YR 3/2	90	10YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ? Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 61400 Van Dyke Avenue City/County: Macomb County Sampling Date: 3/23/22

Applicant/Owner: S&V Companies State: MI Sampling Point: U2

Investigator(s): ASTI Environmental - Brad Kassuba Section, Township, Range: Section 22, T04N, R12E

Landform (hillside, terrace, etc.): top of berm Local relief (concave, convex, none): concave Slope %: ____

Subregion (LRR or MLRA): LRR L Lat: ____ Long: ____ Datum: ____

Soil Map Unit Name: Lupton muck NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: U2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Morus alba*	20	Yes	FACU
2. *Prunus serotina*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Lindera benzoin*	10	No	FACW
2. *Lonicera tatarica*	15	Yes	FACU
3. *Rhus typhina*	15	Yes	UPL
4. *Cornus racemosa*	20	Yes	FAC
5.			
6.			
7.			
	60	=Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. *Celastrus orbiculatus*	5	Yes	UPL
2.			
3.			
4.			
	5	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 16.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	20	x 3 =	60
FACU species	45	x 4 =	180
UPL species	20	x 5 =	100
Column Totals:	95 (A)		360 (B)

Prevalence Index = B/A = 3.79

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point U2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/4	100			C	M	Loamy/Clayey	
6-12	10YR 3/4	100			C	M	Loamy/Clayey	
12-18	10YR 3/2	90	10YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
___ High Chroma Sands (S11) (**LRR K, L)**
___ Loamy Mucky Mineral (F1) (**LRR K, L**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
___ Coast Prairie Redox (A16) (**LRR K, L, R**)
___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
___ Polyvalue Below Surface (S8) (**LRR K, L**)
___ Thin Dark Surface (S9) (**LRR K, L**)
___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 61400 Van Dyke Avenue City/County: Macomb County Sampling Date: 3/23/22

Applicant/Owner: S&V Companies State: MI Sampling Point: W1

Investigator(s): ASTI Environmental - Brad Kassuba Section, Township, Range: Section 22, T04N, R12E

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): concave Slope %:

Subregion (LRR or MLRA): LRR L Lat: Long: Datum:

Soil Map Unit Name: Lupton muck NWI classification: Freshwater Forested/Shrub

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches): 1
Water Table Present?	Yes X	No	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: W1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus deltoides*	50	Yes	FAC
2. *Fraxinus nigra*	20	Yes	FACW
3. *Fraxinus pennsylvanica*	20	Yes	FACW
4.			
5.			
6.			
7.			
	90	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Tilia americana*	20	Yes	FACU
2. *Lindera benzoin*	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	50	x 3 =	150
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	120 (A)		330 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point W1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	100			C	M	Muck	
8-18	10YR 4/1	80	10YR 5/8	20	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- _X_ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- _X_ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- _X_ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** ____

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

SOILS INVESTIGATION
PROPOSED SELF-STORAGE BUILDING
61400 VAN DYKE AVENUE
WASHINGTON TOWNSHIP, MICHIGAN

URBAN LAND CONSULTANTS, LLC
8800 23 MILE ROAD
SHELBY TOWNSHIP, MICHIGAN 48316

AUGUST 1, 2022
BY
McDOWELL & ASSOCIATES

McDowell & Associates
Geotechnical, Environmental & Hydrogeological Services • Materials Testing & Inspection
21355 Hatcher Avenue • Ferndale, MI 48220
Phone: (248) 399-2066 • Fax: (248) 399-2157
www.mcdowasc.com

August 1, 2022

Urban Land Consultants, LLC
8800 23 Mile Road
Shelby Township, Michigan 48316

Job No. 22-252

Attention: Mr. Bob Lindh

Subject: Soils Investigation
Proposed Self-Storage Building
61400 Van Dyke Avenue
Washington Township, Michigan

Dear Mr. Lindh:

In accordance with your request, we have made a Soils Investigation at the subject project.

Field Work and Laboratory Testing

Four Soil Test Borings, designated as 1 through 4, were performed at the subject property at the approximate locations shown on the Soil Boring Location Plan which accompanies this report. The boring locations were selected by the client and field located by our drillers. The borings were advanced to depths of about fifteen feet (15') to twenty feet (20') below the existing ground surface at the boring locations.

Soil descriptions, groundwater observations and the results of field and laboratory tests are to be found on the accompanying Logs of Soil Test Borings and summary sheet of Sieve Analysis results.

All borings encountered five feet six inches (5'6") to eight feet (8') of medium compact to extremely compact fine sand fill including foundry sand. Underlain by soft to extremely stiff silty clay and silt layers, as an exception Borings 2 was all sand with pockets of peat and silty clay and a peat layer from six (6') to seven feet (7'). Peat was also found in Boring 4, underlaying the fill underlain by sand, silt and silty clay.

Soil descriptions and depths shown on the boring logs are approximate indications of change from one soil type to another and are not intended to represent an area of exact geologic change or stratification. The transition from one soil type to the next may be gradual rather than abrupt, and subsurface conditions may be different from those found by the borings at locations between or beyond the actual boring locations. Also, the site shows some signs of modification which could indicate fill and soil conditions different from those encountered at the boring locations.

Groundwater was encountered in each of the borings at initial depths ranging from five feet three inches (5'3") to seven feet eight inches (7'8") below the existing ground surface. Upon completion of drilling, groundwater levels were recorded at depths ranging from four feet nine inches (4'9") to seven feet (7') below existing ground surface. It should be noted that short-term groundwater observations may not provide a reliable indication of the depth of the water table. In soils with significant fines content (clay and/or silt), this is due to the slow rate of infiltration of water into the borehole as well as the potential for water to become trapped in overlying layers of granular soils during periods of heavy rainfall. Water levels in granular soils fluctuate with seasonal and climatic changes as well as the amount of rainfall in the area immediately prior to the measurements. It should be expected that groundwater fluctuations could occur on a seasonal basis and that seams of water-bearing sands or silts could be found within the various clay strata at the site.

Standard Penetration Tests (SPTs) made during the sampling operation indicate that the site soils have poor to very good strengths and densities. The tests resulted in values ranging from 3 blows per foot to 32 blows per six inches. All SPTs were performed with a rope and cathead safety hammer.

Project Description

It is understood that the building types is undecided, one possibility is to be single story block building at the front and single story metal buildings behind and then parking and drives at the subject property. It is anticipated that the proposed structure will transmit relatively light loads to the supporting soils.

Foundation Recommendations

Based on the project information provided and the results of field and laboratory tests, the indications are that the structure could be supported by conventional to deeper than normal spread or strip footings. All exterior footings should be constructed at, or below, a minimum frost penetration depth of three feet six inches (3'6") below finished grade. All interior and exterior load-bearing footings should extend through non-engineered fill soils, soils containing significant amounts of organic substances such as peat, or excessively weak soils. As mentioned earlier peat was encountered in Borings 2 and 4, this material is compressible and if left in place excessive settlement should be expected. To further identify the peat extent, we recommend performing additional test pits along with soil laboratory testing for loss on Ignition (LOI). All strip footings should be continuously/heavily reinforced in order to minimize any noticeable effects of differential settlement. If footings are placed marginal or poor soil, there is a major advantage to light metal building.

Footings constructed at the following boring locations could be proportioned for the design soil pressures shown below, provided this results in the footings bearing on native, non-organic soils:

Boring	Depth			Soil Pressure (psf)
1	2'0"	to	6'0"	2,000*
	6'0"	to	8'0"	1,500*
	8'0"	to	10'0"	1,000
2	8'0"	to	10'0"	3,000

Boring	Depth	Soil Pressure (psf)
3	2'6" to 5'6"	2,000*
	5'6" to 8'0"	3,000
	8'0" to 10'0"	4,000
4	9'0" to 10'0"	3,000

* Soils at these locations were described by our drillers as fill/possible fill materials or containing some organic matter. During footing excavation, if it is determined that these soils contain significant amounts of organic material or are indeed fill soils, then the footing depths should be extended so that they bear on native, non-organic material. Where compacted sand fill is found underneath the footing, it can be left in place if tested and the soil is found suitable and firm prior to concrete placement. Consideration could be given to leaving it in place provided the potential of meaningful settlement could be tolerated. The penetration (N) values in the fill material were quite good indicating it might be engineered fill. We suggest you attempt to find if the fill was engineered if so, you could put the footing on the fill. We would suggest a relatively low design pressures say 2,000 psf, with heavy reinforcement. If the topsoil fill was engineered, we suggest loss on ignition (LOI) tests be performed. Where peat is present below sand fill, there is a potential of consolidated settlement.

Where sand-type soils are overlying clay soils, it is suggested that footing inverts be at least one foot (1') above the top of clay. If this is not possible, it is suggested that the footings extend down to the underlying clay.

Based on the above chart, it appears that lower strength soils may be encountered at the top layer which may necessitate slightly deeper or larger than normal footing sizes. Higher design soil pressures are available at various depths in the borings and could be detailed, if desired.

Deep Foundations

If excavations do not remain stable to allow the installation of footings or engineered fill, or if excavation limits are limited by site constraints, then an alternative deep foundation support system consisting of helical-type piles or geopiers could be used to support the planned structure.

Additional deep foundation systems could consist of auger cast piles, or mini piles. We understand that manufacturers and contractors who use helical-type piles or geopiers have qualified engineering staffs who do length/capacity evaluations. We would anticipate that installation of auger cast piles, or mini piles would produce less vibration concerns.

Engineered Fill

As an alternative to relatively deep footings, the building spread or strip footings could be supported on engineered fill. Existing non-engineered fill, organic soils, soft soils and loose granular soils should be excavated and removed from the proposed foundation area. The excavations should extend beyond the edge of the structure's proposed footings six inches (6") for every foot below the footing. The removal of the unsuitable soils should be done in the presence of a qualified soils engineer or technician to limit the potential for uncontrolled fill or highly organic soils being left behind before

the placement of engineered fill. After the unsuitable soils have been removed, the excavation should preferably be filled with compacted bank run sand similar to MDOT Type I or II granular soils. If clay material is utilized, it should be placed within 3% of its optimum moisture content. If the bottom of the excavation is not sufficiently stable to install the fill material, then a layer of coarse stone fill such as MDOT 6AA or 1x3 crushed stone could be installed. Geotextile fabric should be placed between the coarse stone engineered fill material and lower native granular soils to minimize the amount of fines infiltrating into the aggregate material. If granular material is to be placed above the stone, a six inch (6") layer of MDOT 21AA or an additional layer of filter fabric should be placed above the stone, overlapping the underlying fabric to further minimize the amount of material infiltrating into the aggregate material. The fill soils should be deposited in horizontal lifts not to exceed nine inches (9") in thickness with each lift being compacted uniformly to a minimum density of 95% of its maximum value as determined by the Modified Proctor Test (ASTM D-1557).

One inch by three-inch (1" x 3") size crushed stone or crushed concrete could be used in lieu of the MDOT Type 6AA aggregate and bank run sand that we recommended above. The crushed material would need to be placed and compacted in lifts not exceeding nine inches (9") up to about one foot (1') below the planned footings and/or floor slabs. About a one foot (1') thick layer of MDOT 21AA dense aggregate could then be placed above the crushed material in an effort to choke off the stone. The crushed stone or crushed concrete material should not contain significant amounts of brick and should be relatively clean of lime or cement dust which could potentially foul up or clog the drain tiles. We suggest that the brick content should be less than 5% and cement/lime dust should be less than 3%. The large crushed material will need to be separated from the existing site granular soils by a geotextile fabric. We suggest that a geotextile filter fabric be placed along the bottom and sides of the engineered fill excavation in an effort to minimize fines from migrating into the voids within the crushed material. It should be noted that the use of crushed concrete could cause problems for the basement drains and sump pump. When water percolates through crushed concrete, the pH of the water can increase and minerals can precipitate out of the solution (mostly calcium salts and, in some cases, calcium hydroxide). Mineral deposits precipitating from the solution can shorten the life of sump pumps and plug drain tiles. High pH water can also corrode metal pipes. See AASHTO M 319-02 for discussion of these problems. Since the new structure will have a slab-on-grade, precipitating mineral deposits should not be a major concern.

Foundations placed on the engineered fill could be proportioned for a design soil pressure of 3,000 psf provided the strength is not limited by the presence of weaker underlying materials. Engineered fill should be placed and compacted up to footing and floor invert elevations.

Groundwater Considerations

Groundwater was measured upon completion of drilling near or above the anticipated footing depth. Depending upon the depth of the footings relative to the existing ground surface and the actual conditions at the time of construction. However, where the non engineered fill/unsuitable soil needs to be replaced the bottom of the excavation will be under the water level and it will be necessary to depress the water table in these locations to allow for footings to be constructed and to place the fill on a dry subgrade. It is sometimes possible to construct strip footings a foot or so below the water table in coarse granular soils using a rapid sequence of excavation and placement of concrete. If this is not possible, it may be necessary to use special dewatering techniques to depress the water table in the vicinity of these borings.

In general, it appears footings will extend below the water table in silt and sand soils. It may be possible to extend footings to suitable soils, particularly if the silt/sand soils contain a little clay. We anticipate significant groundwater control will be required. It may be possible to do this with trenches and sumps. It is unlikely deep wells will work where there are high silt contents. Well points will be slow.

Floor Slabs

Fill soils were encountered in each of the borings to depths ranging from five feet six inches (5'6") to eight feet (8') also fill soils over peat were encountered in Borings 2 and 4. If the possibility of more than normal differential settlement can be tolerated, slab-on-grade floors or floor-supporting backfill could be placed at, or near, the present grade in the vicinity of the borings. Any topsoil or other obviously objectionable material should be removed and the subgrade thoroughly proof-compacted. If during the proof-compaction operation, areas are found where the soils yield excessively, the yielding materials should be scarified, dried, and recompacted or removed and replaced with engineered fill as outlined above. Additional laboratory tests on organic material such as LOI is recommended to further evaluate the percentage of organics content, and if this material can stay in place.

Note: Fill soils over peat were encountered in Borings 2 and 4. We have observed continued settlement of fills over peat for periods of 20 years and beyond, but it would be conceivable to place pavements and slab on grade floors at or near the existing grade if more than normal differential settlement can be tolerated. It is recommended to install settlement plates and observe movements for a period of at least 6 months. If the fill had been placed more than 20 years ago, most of the consolidation and settlements could be occurred.

If the possibility of more than normal differential movement cannot be tolerated, then all existing fill soils should be removed and replaced with engineered fill meeting the requirements outlined above, or the floor slab should be structurally supported.

If any existing structures are found, they should be entirely removed from the proposed building area. Buried utilities should be removed or grouted in place. Resulting excavations should be backfilled with engineered fill meeting the requirements outlined above.

To minimize capillary action under floor slabs, we suggest placing at least four inches (4") of clean material on the subgrade followed by a suitable plastic vapor barrier between the clean material and the concrete slab. The clean material could consist of pea stone, MDOT Class I sand, 2NS sand or 6AA crushed stone.

Pavement Design

We anticipate traffic at the site will consist of automobiles, light-duty passenger trucks, and occasional heavy delivery trucks. Heavy-duty pavement sections are recommended for the main drives and areas that will be trafficked by heavy trucks. Fill placed in an uncontrolled manner can be susceptible to variable future settlements due to consolidation of the fill, collapse of voids and buried organic/peat layers. It is suggested that in areas of automobile and light truck traffic, three inches (3") of asphalt with eight inches (8") of high quality, well-graded granular base course be used. In drive areas subject to truck traffic, it is recommended that the asphalt thickness be increased by one

and one-half inches (1.5”). In the areas to be paved, the site should be prepared in a manner similar to that recommended above. The subgrade should be reworked until approximately the upper one foot (1’) of the subgrade is compacted to at least 95% of its maximum dry density as determined by the Modified Proctor Test. It is recommended, as a minimum, that stub drains be provided at the storm sewer catch basins to provide some drainage for the pavement base. The subgrade should be properly sloped to allow drainage of surface water. Eight inches (8”) of concrete pavement should be used in the dumpster area and other intensive truck wheel load areas. Edge drains should be installed in water landscape areas.

Closing

Experience indicates that actual subsurface conditions at the site could vary from those found at the four test borings made at specific locations. It is, therefore, essential that McDowell & Associates be notified of any variation of soil conditions to determine their effects on the recommendations presented in this report. The evaluations and recommendations presented in this report have been formulated on the basis of reported or assumed data relating to the proposed project. Any significant change in the final design plans should be brought to our attention for review and evaluation with respect to the prevailing subsoil conditions.

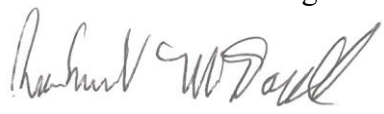
It is recommended that the services of McDowell & Associates be engaged to observe the soils in the footing excavations prior to concreting in order to test the soils for the required bearing capacities. Testing should also be performed to check that suitable materials are being used for controlled fills and that they are properly placed and compacted.

If we can be of any further service, please feel free to call.

Very truly yours,

McDOWELL & ASSOCIATES

Tony (Antoine) Merheb, M.S., P.E.
Senior Geotechnical Engineer



Robert McDowell, M.S., P.E.
CEO McDowell & Associates

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McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue • Ferndale, MI 48220
Phone: (248) 399-2066 • Fax: (248) 399-2157

LOG OF SOIL BORING NO. 1

PROJECT Soils Investigation
Storage Building

LOCATION 61400 Van Dyke Avenue
Washington Township, Michigan

JOB NO. 22-252

SURFACE ELEV. _____ DATE 7-18-2022

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1								
			Compact moist brown fine silty clayey SAND with trace of gravel, fill						
A	2			4					
UL				6	9.9	116			
	3			10					
			3'0"						
	4								
			Extremely compact moist brown and black fine SAND with trace of gravel (possible foundry sand), fill						
B				5					
UL	5			10	10.2	116			
				22					
	6								
			6'0"						
			Compact moist brown and black fine to medium SAND with traces of pebbles and peat, fill						
C	7			2					
UL				3	14.2				
	8		7'8"	5					
			Compact wet gray fine to medium SAND with gravel						
	9								
			9'0"						
D				1					
UL	10		Soft moist variegated silty sandy CLAY with trace of pebbles	1	13.2	131			
				2			*	(500)	
	11								
			11'6"						
	12								
	13								
			Extremely stiff moist variegated silty CLAY with traces of sand and pebbles						
	14								
E				10					
UL	15			17					
				19					
			15'6"						
	16								
	17								
			Note: Used track rig.						
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	7	FT.	8	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	7	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Heavy			

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LOG OF SOIL BORING NO. 2

PROJECT Soils Investigation
Storage Building

LOCATION 61400 Van Dyke Avenue
Washington Township, Michigan

JOB NO. 22-252

SURFACE ELEV. _____ DATE 7-18-2022

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1								
			Compact moist brown fine to medium SAND with traces of silt and gravel, fill						
A	2			4					
UL				3	6.3	109			
	3			3					
			3'0"						
	4		Medium compact moist brown fine SAND with trace of gravel and possible peaty topsoil, fill						
B				2					
UL	5			3	25.2	113			
			5'0" Firm moist variegated silty CLAY with trace of foundry sand, fill	4					
	6		6'0"						
C	7		Medium compact wet black sandy PEAT	1					
UL				3	114.1	82			
	8		7'8"	3					
	9		Medium compact wet gray silty SAND with trace of silty clay						
D				3					
UL	10			3	15.7	132			
			10'3"	8			*	(3000)	
	11								
	12		Stiff moist silty CLAY						
	13								
			13'5"						
	14								
E				4					
UL	15			10					
				22					
	16								
	17		Extremely compact wet gray fine SAND with gravel and occasional moist silty clay seams						
	18								
	19								
F				15					
UL	20			32					
			20'0"	---					
	21								
	22		Note: Used track rig.						
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	5	FT.	4	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	5	FT.	7	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Heavy			

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LOG OF SOIL BORING NO. 3

PROJECT Soils Investigation
Storage Building

LOCATION 61400 Van Dyke Avenue
Washington Township, Michigan

JOB NO. 22-252

SURFACE ELEV. _____ DATE 7-18-2022

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Compact moist brown fine SAND with gravel, fill						
			1'6"						
A	2			5					
UL				12	15.0	118			
	3		Extremely compact moist discolored clayey SAND, fill	19					
	4								
			4'0"						
B				8					
UL	5		Very compact moist brown and blue silty fine SAND with trace of clay, possible fill	9	10.4	120			
			5'6"	9					
	6								
C	7		Very compact wet gray fine to medium SAND with trace of silt and gravel	6					
UL				8	17.1	126			
	8			10					
			8'0"						
	9								
D				8					
UL	10		Stiff brown silty CLAY with lenses of sand and pebbles	9	14.0	138			
				9			*	(5000)	
	11								
	12								
			12'0"						
	13								
	14		Extremely compact wet brown SILT						
E				11					
UL	15			18					
			15'6"	19					
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	5	FT.	6	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	6	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Heavy			

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LOG OF SOIL BORING NO. 4

PROJECT Soils Investigation
Storage Building

LOCATION 61400 Van Dyke Avenue
Washington Township, Michigan

JOB NO. 22-252

SURFACE ELEV. _____ DATE 7-18-2022

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1								
A	2			7					
UL				11	9.8	116			
	3		Compact moist brown and black fine SAND (possible foundry sand), fill	13					
	4								
B				3					
UL	5			5	13.1	115			
			5'3"	6					
	6		Compact wet black fine SAND (possible foundry sand with petroleum odor), fill						
			6'6"						
C	7		Medium compact wet black and brown fine SAND (possible foundry sand with petroleum odor), fill	3					
UL				4	23.5	118			
	8			2					
			8'0"						
	9		Moist black clayey PEAT						
			9'0"						
D				5					
UL	10		Compact wet gray fine SAND with gravel	6	15.9	128			
				6			*	(6000)	
	11		10'6" Compact wet brown SILT with trace of sand						
			11'0"						
	12								
	13								
	14								
			Very stiff moist variegated SILT to silty CLAY with trace of pebbles						
E				7					
UL	15			8	12.4	139			
				11			*	(9000)	
	16								
	17								
			17'0"						
	18								
	19		Extremely stiff moist blue sandy silty CLAY with pebbles						
F				12					
UL	20			12					
				16					
			20'6"						
	21								
	22								
	23		Note: Used track rig.						
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

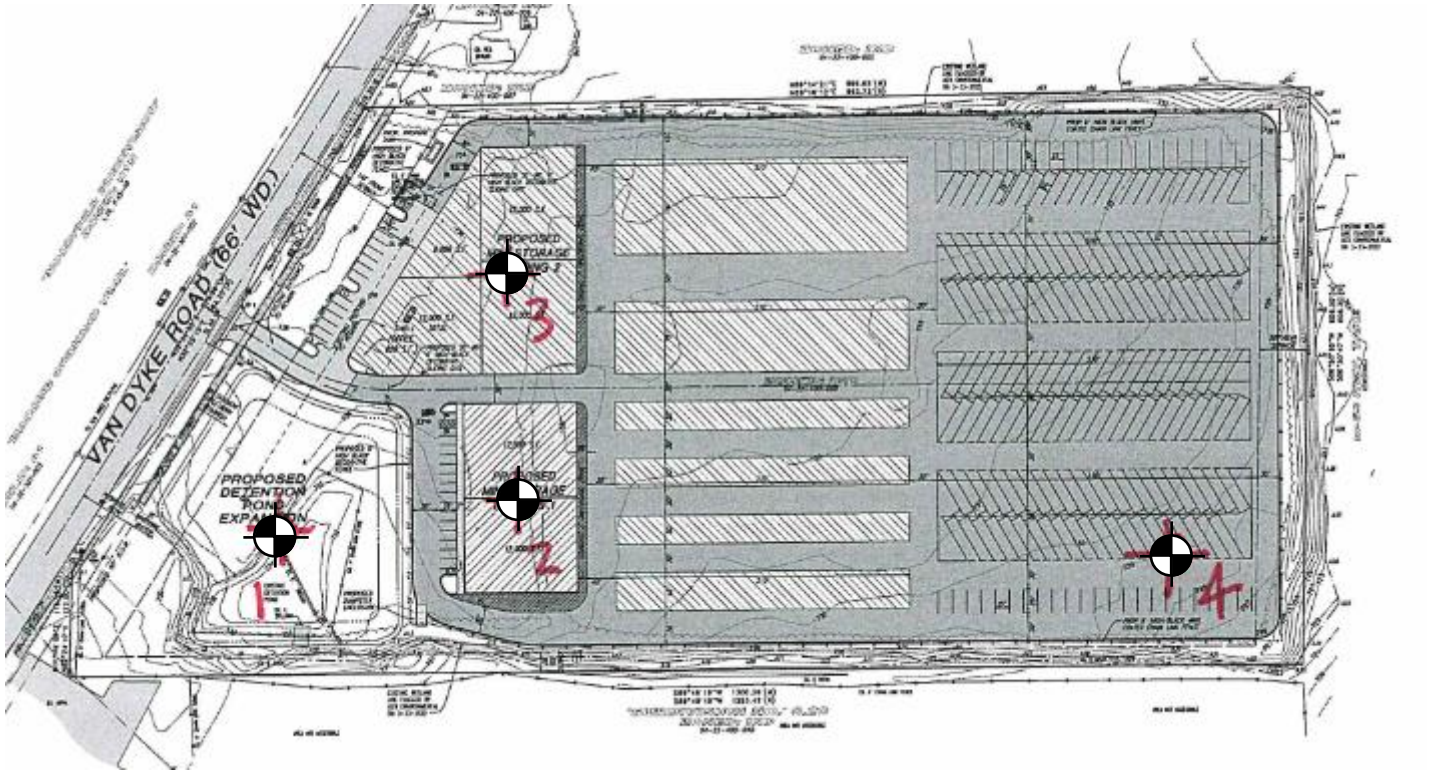
GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	5	FT.	3	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	4	FT.	9	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Heavy			

Job No. 22-252

SIEVE ANALYSIS SUMMARY

Boring	Sample	% Passing #4 Sieve	% Passing #10 Sieve	% Passing #40 Sieve	% Passing #100 Sieve	% Passing #200 Sieve
1	C	73.5	67.3	54.0	32.8	28.1
2	D	99.7	99.0	95.0	62.7	39.7
3	C	96.4	91.6	81.4	15.2	5.8



Note: Base drawing prepared by others.

LEGEND

Soil Boring Locations, 1 through 4:
Drilled by McDowell & Associates

McDowell & Associates
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Soil Boring Location Plan

Job No. 22-252