



Ecosystem Solutions, Inc.

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Warwick, RI 02888

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June 13, 2023

Project no. W23-1845

Edward Goodwin, Chair
Conservation Commission
301 Main Street
Sturbridge, MA 01566

RE: NOI Peer Review
68 Paradise Lane / Map 505 Lot 09E42-068
Sturbridge, Massachusetts
DEP file no. 300-1155

Chair Goodwin:

Ecosystem Solutions, Inc. has finalized the NOI peer review for the above-referenced property (Property).

The following documents were reviewed:

- Plans titled "PROPOSED SITE PLAN 68 PARADISE LANE STURBRIDGE, MA 01518", sheets 1-3, by McClure Engineering, Inc., stamped by Peter C. Engle P.E., and dated February 15, 2023, with a final revision date of March 14, 2023 and at a scale of 1"=10'.
- NOI submitted on behalf of Jeffrey Buchanan including: a cover letter, Notice of Intent forms and attachments, Sturbridge NOI forms including abutters list and notification letter, Check to cover filing fees, Wetland Resource Evaluation report by EcoTec, Inc. dated November 14, 2022, and NOI Site Report by EcoTec dated February 16, 2023

Property Description

The Property is located southeast of Paradise Lane at its western end in Sturbridge. It is nestled between Big Alum Pond to the southeast and Mt. Dan to the northwest. According to the Sturbridge, MA online property card, the dwelling on-site consists of a one-bedroom camp style house built in 1867. Associated with the house includes a gravel driveway, a shallow well, lawn, garden beds, retaining wall, and recently repaired granite steps leading to the water. Along Paradise Lane to the east are single-family residences and to the west is one more single-family home.

Mt. Dan has a steep gradient with natural springs along its slopes. There is a drainage ditch along the north side of Paradise Lane opposite the Property that hosts hydrophytic vegetation. This is drained through a twelve (12) inch corrugated metal pipe under the road and onto the northern corner of the Property. There is a shallow well located in the western corner of the lawn, near Paradise Lane. Beyond the southwestern edge of the lawn is a forested swamp strewn with boulders.

Initial File Review

The cover page of the NOI filed by EcoTec, Inc. describes Site Plans by McClure Engineering as dated February 16, the plan is actually dated February 15. Another note is the USGS map used to help evaluate the site is referred to as the current USGS map, Warren Quadrangle, dated 1982. However, the most recent USGS map of the Property is the East Brookfield 2021 USGS map. These maps do not have any significant changes in or near the subject area, the evaluation of the absence of rivers on or near the Property is accurate.

Proposed conditions include stormwater improvements and grading to divert runoff from the existing granite stairs leading to the pond. These stairs recently required repair due to frost and erosive action. A deep-sump catch basin is proposed in the northern Property corner near corrugated metal pipe that crosses under Paradise Lane. This basin would trap sediment and includes a hood to catch grease and oil. Existing conditions allow stormwater to flow from the corrugated metal pipe through the wetland to the pond without interference.

The project narrative and the proposed site plan differ regarding the exact area of disturbance within the Bordering Vegetated Wetland (BVW). The site plan shows fifty (50) square feet of wetland fill that is remediated with fifty-five (55) square feet of replication adjacent at the easternmost Property corner. Adjacent to that, an eighty (80) square foot area of BVW will be graded to redirect water to the replication area. Further north, thirty (30) square feet of BVW will be disturbed due to grading associated with directing flow from the deep-sump catch basin. This area is proposed to be restored. A total of one-hundred and sixty (160) square feet of BVW is proposed to be disturbed with fifty-five (55) square feet of replication and one-hundred and ten (110) square feet of restoration according to the proposed site plan. The narrative switches between describing fifty (50) and fifty-five (55) square feet of impact on BVW maintained as turf. It further describes mitigating measures as “constructing 105 square feet of BVW”. This does not match the proposed site plan. Wetland replication and restoration areas are proposed to be planted with native herbaceous and woody wetland plants. Two weep holes are proposed to be placed in the concrete retaining wall bordering Big Alum Pond at the edge of the wetland replication area.

Site Inspection

The site inspection was conducted on Thursday, May 25th. The previous day Sturbridge had a total of 0.175 inches of rain, with a total of 1.467 inches of rain for the previous five days. These are typical conditions for this time of year and did not bias on our investigation into the wetland boundaries.

It is our opinion that wetlands on-site are more extensive than the current flagging displays. On the west side of the Property, the A-series wetland flags follow the edges of the lawn. This is not entirely accurate as the existing well nearby has provided a convenient opportunity for groundwater to surface. We believe that water from the well has played a significant role in saturating part of the lawn for long enough periods that it currently hosts a community of herbaceous vegetation with obligate and facultative wetland indicator statuses. This vegetation is summarized in the table below. Three soil samples were taken along the upland edges of this vegetation, within thirty (30) inches of the soil test pits analyzed by EcoTec.

Test holes 1 and 2 displayed saturation at the surface and inundation within twelve (12) inches of the surface during the growing season. According to the DEP Wetland Replication Guidelines- March 2002, the beginning of the growing season for Worcester County- South is April 14. The site inspection was performed on May 25. Therefore, we believe that the saturation and inundation found in the lawn coming from overflow from a shallow well, represent primary indicators of hydrology under current wetland delineation methodology.

Test hole 3 showed saturation at ten (10) inches with no standing water in the auger hole. Test holes 2 and 3 both had redox *in-situ* within twelve (12) inches of the soil surface.

Table 1. Dominant vegetation observed within lawn on the west side of the house.

Common name	Latin name	Indicator Status
Moneywort	<i>Lysimachia nummularia</i>	FACW
Woolly sedge	<i>Carex pellita</i>	OBL
Northern sweetgrass	<i>Anthoxanthum hirtum</i>	FACW
Cluster fescue	<i>Festuca paradoxa</i>	FAC

On the east side of the Property, the B-series wetland flags follow indicators of hydrology and vegetation. However, this series of flags does not demonstrate the full extent of wetlands in the area. The previously mentioned culvert that drains a ditch on the other side of Paradise Lane empties near the northern Property corner. This water flows along the Property boundary towards Big Alum Pond. This area has a dominance of herbaceous wetland plants and a mix of upland and wetland indicating woody shrubs and trees. It is my opinion that this area as well as the ditch across Paradise Lane both qualify as wetland resource areas.

A wetland replication area is proposed in a small upland area on the eastern corner of the Property, adjacent to B7 and B8. Upon investigation, a piece of rebar was found driven into the ground inside of the Property borders. This type of marker typically indicates the corner of a property and raises the question: are the property lines on the proposed site plan accurate? Another thing to note about this area is a PVC pipe was found daylighting near the pond's edge. It seems this pipe may originate from the neighboring property to the east. We speculate that it may be associated with a foundation drain.

Test holes were dug in the yard between the house and Big Alum Pond. These holes showed the soil under the lawn is fill to a depth of at least eighteen (18) inches. Due to the gradient and composition of Mt. Dan and the position of the Property, it is my opinion that the wetlands on the Property were significantly larger before the construction of the house. This house was built before the Wetland Protection Act was introduced and therefore this disturbance of wetland was exempt from regulation.

Other

The wetland replication area is proposed in a small upland area on the east corner of the Property. The grading and planting that would take place in this area will cause significant damage to the root structure of a large red maple tree growing on the Property boundary.

Conclusion

1. Regarding the A-series wetland flags, with a dominance of wetland plants as well as primary indicators of hydrology, I recommend adjusting the A-series flags between flag A4 and A6 to show the wetland created by the well. Flags SCC 4A, SCC 4B, SCC 4C, SCC 4D, SCC 4E and SCC 4F were placed between these points to delineate what we believe is the perimeter of these indicators of hydrology and wetland vegetation.
2. For the B-series wetland flags, we recommend extending the line further north until it reaches the culvert. Flags SCC B1, SCC B2, SCC B3, SCC B4 and SCC B5 were placed as our recommendation delineate the wetland beyond the B-series flags.
3. We recommend that the proposed site plan be revised to depict the extent of BVWs on site and their buffer zones, as flagged by EcoTec and expanded by ESI on behalf of the Sturbridge Conservation Commission. Once that work is agreed-upon, further review regarding the proposed work can be addressed.
4. We recommend that the Applicant research the legitimacy of the property lines and rebar found. We recommend that a Professional Land Surveyor perform the work in this regard. This could have a significant impact on the proposed replication area, at a minimum.
5. Look into differences between the project narrative and the proposed site plan regarding the exact area of disturbance within the Bordering Vegetated Wetland (BVW) per comments above.

Should you have any questions regarding this letter, please do not hesitate to call at (401) 741-3263 or by using the other contact information above.

Sincerely,

Ecosystem Solutions, Inc.

Brandon B. Faneuf, M.S., Principal
PWS, RPSS, CWB, CPESC

BF/cc





Existing well that seeps water onto the lawn, with Paradise Lane in the background.



Southwest side of the Property looking northwest. Orange flags were placed by ESI in the lawn mark the extent of observed hydrology and dominant wetland vegetation.

68 Paradise Lane / Map 505 Lot 09E42-068
Sturbridge, Massachusetts

SITE PHOTOGRAPHS



Ecosystem Solutions, Inc.
100 Jefferson Blvd., Ste. 225 Warwick, Rhode Island 02888

Project no. W23-1845


Pictures 1 & 2



Looking north towards the well and Paradise Lane beyond



Close up of wetland vegetation in the lawn near the A-series wetland flags. Moneywort is prominent in this photograph.


68 Paradise Lane / Map 505 Lot 09E42-068 Sturbridge, Massachusetts	SITE PHOTOGRAPHS	
 Ecosystem Solutions, Inc. 100 Jefferson Blvd., Ste. 225 Warwick, Rhode Island 02888	Project no. W23-1845	Pictures 3 & 4



South end of the B-series wetland line near the recently repaired stairs. Notice water flowing toward the steps, which originates from wetland sources.



Looking north along the B-series flags.


68 Paradise Lane / Map 505 Lot 09E42-068 Sturbridge, Massachusetts	SITE PHOTOGRAPHS	
 Ecosystem Solutions, Inc. 100 Jefferson Blvd., Ste. 225 Warwick, Rhode Island 02888	Project no. W23-1845	Picture 5 & 6



Proposed wetland replication area w/ corrugated PVC pipe from unidentified source.

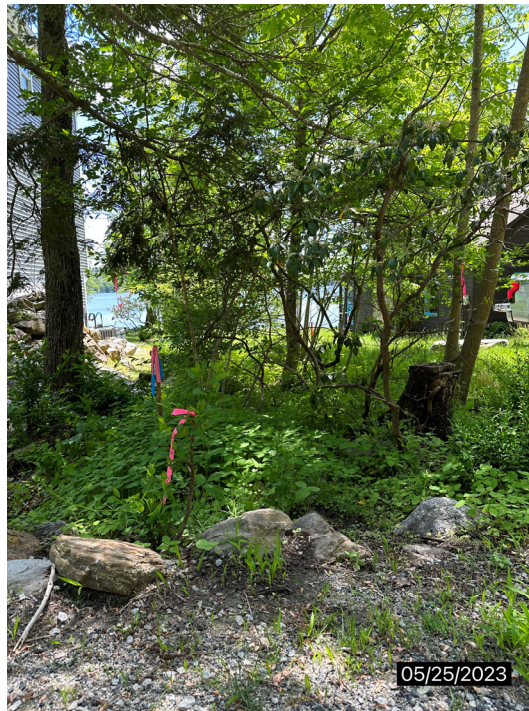


Rebar found in the proposed wetland replication area. Possible property corner. If true, then the property lines aren't accurately depicted and the replication area is proposed partly off-site.


68 Paradise Lane / Map 505 Lot 09E42-068 Sturbridge, Massachusetts	SITE PHOTOGRAPHS	
 Ecosystem Solutions, Inc. 100 Jefferson Blvd., Ste. 225 Warwick, Rhode Island 02888	Project no. W23-1845	Pictures 7 & 8



Man-made ditch on the north side of Paradise Lane with rushes and Jewelweed. It receives water from the base of Mt. Dan and is better described as an intermittent stream.



Looking south along the Property boundary from where the culvert passes underneath Paradise Lane. Pink flags were placed by ESI to mark the edge of wetland.

68 Paradise Lane / Map 505 Lot 09E42-068 Sturbridge, Massachusetts	SITE PHOTOGRAPHS	
 Ecosystem Solutions, Inc. 100 Jefferson Blvd., Ste. 225 Warwick, Rhode Island 02888	Project no. W23-1845	Pictures 9 & 10



A large red maple with a damaged leader growing adjacent to the replication area



Looking northeast along the cement retaining wall towards the replication area

68 Paradise Lane / Map 505 Lot 09E42-068
Sturbridge, Massachusetts

SITE PHOTOGRAPHS



Ecosystem Solutions, Inc.
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Pictures 11 & 12

FIG. 1.

ZONING INFORMATION TABLE - STURBRIDGE, MA
68 PARADISE LANE

ASSESSOR'S MAP ID: 505-09E42-068 DEED: BK 68327 PG 68
ZONING: SUBURBAN RESIDENTIAL
GROUNDWATER PROTECTION OVERLAY DISTRICT

EXISTING USE: SINGLE FAMILY RESIDENTIAL
PROPOSED USE: SINGLE FAMILY RESIDENTIAL

	REQUIRED	EXISTING
LOT SIZE (MIN.)	32,670 S.F.	10,378 S.F.±
FRONTAGE	125 FT.	138.67 FT.±
FRONT SETBACK	30 FT.	31.5 FT.±
SIDE/REAR SETBACK	15 FT.	25.9 FT.±
LOT COVERAGE (MAX)	15%	8.1%
BUILDING HEIGHT (MAX.)	35 FT.	15 FT.±
HABITABLE FLOOR AREA (MIN.)	750 S.F.	620 S.F.±
IMPERVIOUS AREA	2,500 S.F.	1,390 S.F.±

RESOURCE AREA BUFFER ZONE CALCS

BUFFER ZONE	25' LAKE	50' LAKE	0-25' BVW	25-50' BVW
BUILDING COVERAGE	0 S.F.	134 S.F.	658 S.F.	182 S.F.
IMPERVIOUS AREA*	0 S.F.	134 S.F.	761 S.F.	536 S.F.

*EXCLUDES EXISTING LAKEFRONT CONC. RETAINING WALL

GENERAL NOTES:

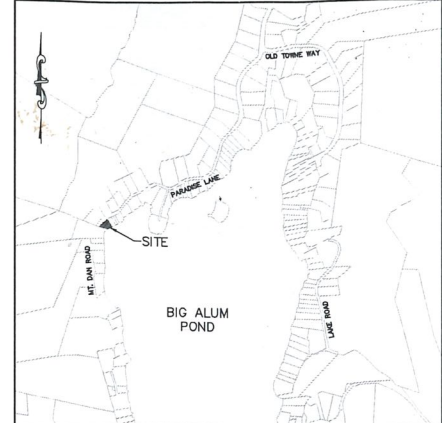
- THIS PLAN IS TO BE UTILIZED ONLY FOR THE PROPOSED CONSTRUCTION AT 68 PARADISE LANE AS ILLUSTRATED HEREON.
- ALL CHANGES TO THIS PLAN MUST BE APPROVED BY THE TOWN OF STURBRIDGE.
- ALL SITE WORK AND MATERIALS SHALL BE IN COMPLIANCE WITH THE TOWN OF STURBRIDGE RULES AND REGULATIONS.
- ANY CONDITIONS DURING CONSTRUCTION THAT DIFFER FROM THOSE ENCOUNTERED DURING TESTING SHALL BE REPORTED TO THE ENGINEER OF RECORD IMMEDIATELY.
- PROPERTY LINES SHOWN ON THIS PLAN BASED ON DEED OF RECORD.
- OFFSETS ARE NOT TO BE USED FOR THE REPRODUCTION OF PROPERTY LINES.
- ALL VERTICAL ELEVATIONS BASED ON NAD 1988.
- ALL STRUCTURES TO BE LINED WITH MAGNETIC TAPE FOR FUTURE LOCATION.
- THE PROPOSED WORK IS SUBJECT TO THE WETLANDS PROTECTION ACT.
- THE PROPOSED CONSTRUCTION DOES NOT FALL WITHIN A FLOOD HAZARD ZONE.
- BENCHMARKS MUST BE SET PRIOR TO COMMENCEMENT OF ANY WORK.
- ALL DISTURBED AREAS TO BE LOAMED, SEEDED, FERTILIZED AND MULCHED. STABILIZATION OF DISTURBED AREAS SHALL BE CHECKED THROUGHOUT CONSTRUCTION PHASE UNTIL VEGETATION IS ESTABLISHED AND REPAIRED AS NEEDED.

NOTES:

- EXISTING CONDITIONS AS SHOWN ARE BASED UPON AN ACTUAL FIELD SURVEY PERFORMED BY MCCLURE ENGINEERING, INC. UPON THE GROUNDS BETWEEN OCTOBER 2022 AND JANUARY 2023.

GENERAL CONSTRUCTION NOTES:

- THE CONSTRUCTION SHALL CONFORM TO THE STANDARDS AS SET BY THE STURBRIDGE PLANNING BOARD SUBDIVISION RULES AND REGULATIONS.
- THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES ARE APPROXIMATE ONLY. THE ENGINEER DOES NOT GUARANTEE THEIR ACCURACY OR THAT ALL UTILITIES AND SUBSURFACE STRUCTURES ARE SHOWN. THE CONTRACTOR SHALL VERIFY SIZE, LOCATION AND INVERT ELEVATIONS OF THE UTILITIES AND STRUCTURES, AS REQUIRED PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES WITH RECORD DATA SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY. THE CONTRACTOR IS CAUTIONED TO CONTACT DIG SAFE (1-888-344-7233) 72 HOURS BEFORE DIGGING.
- ALL MATERIALS AND CONSTRUCTION PRACTICES SHALL BE IN CONFORMANCE WITH THE TOWN OF STURBRIDGE SPECIFICATIONS AND DETAILS OR IN THE ABSENCE OF APPROPRIATE STANDARDS, THE LATEST EDITION OF THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT) CONSTRUCTION STANDARDS AND THE MDPW "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES", SHALL APPLY.
- ELECTRIC, GAS, TELEPHONE AND CATV UTILITY CONNECTIONS AND SERVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RESPECTIVE UTILITY.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE HIS WORK WITH THE APPROPRIATE HIGHWAY & UTILITY DEPARTMENTS. CONTRACTOR SHALL MAINTAIN ALL EXISTING AND NEWLY INSTALLED UTILITIES IN GOOD WORKING ORDER AND SHALL PROTECT THEM FROM DAMAGE AT ALL TIMES UNTIL THE WORK IS COMPLETED AND ACCEPTED.
- THE CONTRACTOR SHALL UTILIZE ALL MEASURES AND MATERIALS NECESSARY TO ENSURE THE SAFETY OF ALL PERSONS AND PROPERTIES AT THE SITE DURING CONSTRUCTION. ALL EXCAVATIONS SHALL CONFORM TO CURRENT OSHA STANDARDS.
- UNLESS OTHERWISE NOTED, ALL DISTURBED AREAS SHALL BE DRESSED WITH A MINIMUM OF FOUR INCHES (4") OF LOAM AND SHALL BE SEEDED WITH AN APPROVED GRASS MIX. SLOPES EXCEEDING 2:1 SHALL BE LOAMED AND STABILIZED WITH PEGGED SOD OR APPROVED EROSION CONTROL BLANKETS UNLESS OTHERWISE NOTED.
- WORK WITHIN THE STREET RIGHT-OF-WAY SHALL CONFORM TO THE CONDITIONS OF THE PERMIT ISSUED BY THE TOWN OF STURBRIDGE D.P.W.
- ALL CONSTRUCTION CONTROL SHALL BE BASED ON THE APPROVED PLANS.



HOR. SCALE IN FEET: 1"=10'

REV	DATE	DESCRIPTION	MADE BY
1	3.14.23	PER CONCOM COMMENTS	PE
			PE

PETER C. ENGLE, P.E.
PROFESSIONAL ENGINEER
MA LIC. NO. 53736

MARK T. LAPPAD, P.L.S.
PROFESSIONAL LAND SURVEYOR
MA LIC. NO. 38040

TAX MAP REFERENCES:

PARCEL I.D. 505-09E42-068

RECORD OWNERS:

JEFFREY D. BUCHANAN
68 PARADISE LANE,
STURBRIDGE, MA 01518
DEED BOOK 68327 PAGE 182

DEED REFERENCES:

(WORCESTER COUNTY REGISTRY OF DEEDS)

DEED BOOK 68327 PAGE 182

ZONING:

ZONE - SUBURBAN RESIDENTIAL DISTRICT
AREA - 3/4 AC
FRONTAGE - 125'
FRONT - 30'
SIDE - 15'
REAR - 15'
MAX LOT COVERAGE - 15%

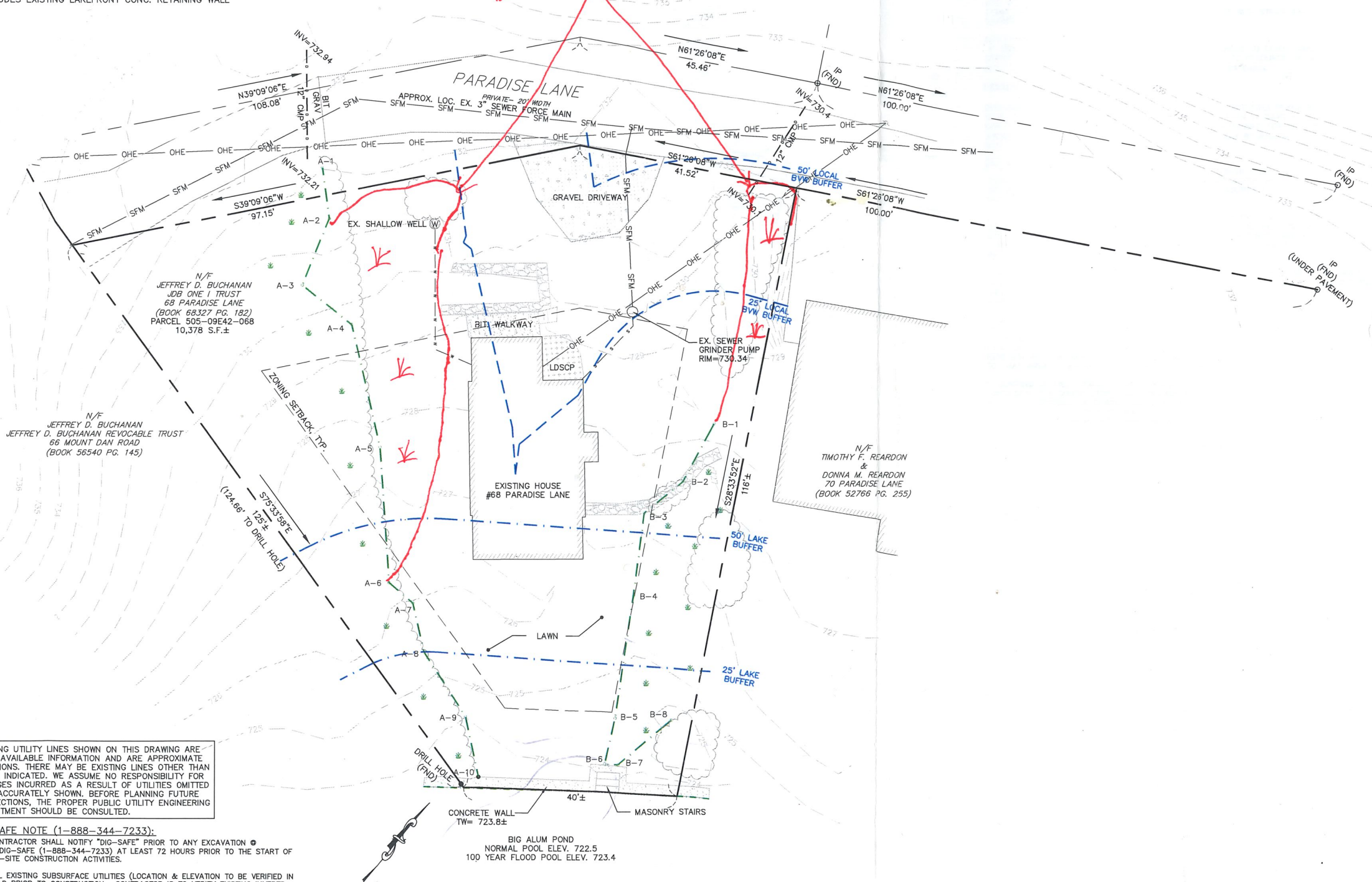
FEMA FLOOD MAP

MAP - 25027C0909E, DATED 7/4/2011

WETLAND DELINEATION PERFORMED BY ECOTEC, INC.
102 GROVE STREET, WORCESTER, MA 01605-2629
ON OCTOBER 24, 2022.

NOTES:

- THE PURPOSE OF THIS PLAN IS TO DEPICT THE EXISTING CONDITIONS AT 68 PARADISE LANE, STURBRIDGE, MA 01566
- EXISTING CONDITIONS SURVEY PERFORMED BY MCCLURE ENGINEERING, INC. BETWEEN OCTOBER 2022 AND JANUARY 2023.
- HORIZONTAL CONTROL IS BASED UPON THE NORTH AMERICAN DATUM OF 1983.
- ELEVATIONS REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988.
- EXISTING UTILITY LINES SHOWN ON THIS DRAWING ARE FROM AVAILABLE INFORMATION AND ARE APPROXIMATE LOCATIONS. THERE MAY BE EXISTING LINES OTHER THAN THOSE INDICATED. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. BEFORE PLANNING FUTURE CONNECTIONS, THE PROPER PUBLIC UTILITY ENGINEERING DEPARTMENT SHOULD BE CONSULTED.



EXISTING UTILITY LINES SHOWN ON THIS DRAWING ARE FROM AVAILABLE INFORMATION AND ARE APPROXIMATE LOCATIONS. THERE MAY BE EXISTING LINES OTHER THAN THOSE INDICATED. WE ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. BEFORE PLANNING FUTURE CONNECTIONS, THE PROPER PUBLIC UTILITY ENGINEERING DEPARTMENT SHOULD BE CONSULTED.

DIG-SAFE NOTE (1-888-344-7233):

- CONTRACTOR SHALL NOTIFY "DIG-SAFE" PRIOR TO ANY EXCAVATION 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO THE START OF ANY ON-SITE CONSTRUCTION ACTIVITIES.
- ALL EXISTING SUBSURFACE UTILITIES (LOCATION & ELEVATION TO BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION. CONTRACTOR IS TO VERIFY EXISTING INVERTS AND NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

BIG ALUM POND
NORMAL POOL ELEV. 722.5
100 YEAR FLOOD POOL ELEV. 723.4



McCLURE
ENGINEERING, INC.
119 Worcester Road
Charlton, MA 01507
Tel: (508) 248-2005
Fax: (508) 248-4887
Email: pengle@mcclureengineering.com

PROPOSED SITE PLAN
68 PARADISE LANE
STURBRIDGE, MA 01518
PREPARED FOR:
JEFF BUCHANAN
68 PARADISE LANE
STURBRIDGE, MA

DRAWN BY:	IP
DATE:	2.15.23
CHK BY:	ML
SCALE:	1"=10'
PROJ. NO.	287-2819-N

EXISTING
CONDITIONS PLAN