NC94

P.O. Box 129
Morrisville, NC 27560

(919) 467-1239

MacCONNELL & Associates, P.C.
"Engineering Today For Tomorrow's Future"

501 Cascade Pointe Lane
Suite 103
Cary, NC 27513

www.macconnellandassoc.com

November 21, 2023

To Local Health Department:

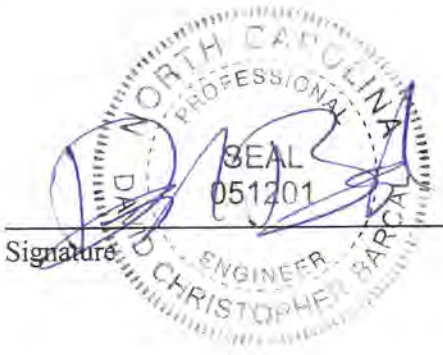
Please note the following Session Law:

WAIVER OF POST-CONSTRUCTION CONFERENCE FOR CERTAIN ENGINEERED WASTEWATER SYSTEMS
SECTION 12A. G.S. 130A-336.1(j) reads as rewritten: House Bill 366 Session Law 2021-117 Page 7.

Per the above reference Session Law, we request that the Post-Construction Conference be waived for the following project:

Client: Caruso Homes
Project: 1425 Baptist Grove Road
Project: A73268.00

Requested By:
Engineer: David C. Barcal, P.E.



Signature

Approved By:
Owner or Owner's Representative:

Joseph Davis (Caruso Homes)
Print Name

Signature

Caruso Homes
1425 Baptist Grove Road

Authorization to Operate
Engineered Option Permit
Pressure Manifold System

Harnett County, North Carolina

Project Number: A73268.00

Date of Preparation: November 20, 2023

Supporting Information &
Technical Specifications Prepared By:
MacConnell & Associates, P.C.
Full-Service Consulting Engineers

501 Cascade Pointe Lane, Ste 103
Cary, North Carolina 27513

Post Office Box 129
Morrisville, North Carolina 27560

Telephone: (919) 467-1239 Fax: (919) 319-6510

MacCONNELL & ASSOCIATES, P.C.

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    A. Signed and Sealed Evaluation of Soil Conditions & Site Features

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    E. On-site Wastewater Contractor's Signed Statement

    F. Signed and Sealed Statement Pursuant to 15A NCAC 18A. 1938(h)

2. Notarized Letter Documenting Owner's Acceptance of System from the PE

Caruso Homes
Engineered Option Permit

1. Common Form Part 3 – Authorization to Operate

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PART 3: Authorization to Operate (ATO)

Except for date received, the Section below is to be completed by the Owner or the PE.

LHD USE ONLY: Initial submittal of request for ATO received: _____ by _____
Date *Initials*

Date of Post-construction Conference: _____

Post-construction Conference waived in accordance with G.S. 130A-336.1(j): _____

The following items are included in this submittal for an Authorization to Operate under an EOP:

1.	Signed and sealed copy of the Engineer's report that includes the information in G.S. 130A-336.1(k)(1) and 15A NCAC 18A .1971(f)	☑ Yes	☐ No
2.	Operation and management program and ORC contract, if applicable	☑ Yes	☐ No
3.	Fee (as applicable)	☐ Yes	☑ No
4.	Notarized letter documenting Owner's acceptance of the system from the PE	☑ Yes	☐ No
5.	Owner meets requirements of ownership or control of the system per 15A NCAC 18A .1938(j)	☑ Yes	☐ No
6.	Easement, right of way, or encroachment agreement required per 15A NCAC 18A .1938(j)	☐ Yes	☑ No
7.	Multi-party agreements required, as applicable, pursuant to 15A NCAC 18A. .1937(h) If yes, agreements filed in _____ County Register of Deeds in Deed Book _____ Page _____	☐ Yes	☑ No

Attestation by the Owner or the PE for Authorization to Operate

I, David C. Barcal hereby attest that all items indicated above have been provided to the
Print name of Owner or Professional Engineer
Harnett County LHD and the system shall meet applicable federal, State, and local laws, regulations, rules and ordinances in accordance with G.S. 130A-336-.1(e)(6).

_____ 11/20/23
Signature of Owner or Professional Engineer *Date*

This section for LHD Use Only.

LHD Review of required information for the ATO

☐ INCOMPLETE

Based upon review of information submitted in the Section above, the following items are missing from the information required for an Authorization to Operate for an EOP: _____

_____.

Copies of this signed form were sent to the design PE and the Owner on _____ via _____.
Date *Email, FAX, USPS, Hand-delivered*

_____ _____ _____
Print name of authorized Agent of the LHD *Signature of authorized Agent of the LHD* *Date*

☐ COMPLETE

Based upon review of information submitted in the Section above, this Authorization to Operate is hereby issued in accordance with G.S. 130A-336.1(m).

A copy of this complete NOI/ATO with tracking information was sent to the State on _____ via _____.
Date *Email, FAX, USPS, Hand-delivered*

_____ _____ _____
Print name of authorized Agent of the LHD *Signature of authorized Agent of the LHD* *Date*

ISSUANCE OF CERTIFICATE OF OCCUPANCY: Once the LHD determines completeness based upon the ATO submission, the owner may apply to the local permitting agency for permanent electrical service to a residence, place of business or place of public assembly pursuant to G.S. 130A-339.

Caruso Homes
Engineered Option Permit

A. Evaluation of Soil Conditions & Site Features

MacConnell & Associates, P.C.
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Cary, North Carolina 27513

P.O. Box 129
Morrisville, North Carolina 27560

Phone: (919) 467-1239
Fax: (919) 319-6510

Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, 27588
919-569-6704

April 20, 2023
Project # 4426 - Lot 2

Caruso Homes
Attention: James Rumley
110 Horizon Drive, Suite 320
Raleigh, NC 27615

RE: Preliminary soil/site evaluation for EOP at Baptist Grove Road Lot 2 Harnett, NC.

Dear Mr. Rumley:

Central Carolina Soil Consulting, PLLC conducted a preliminary soil evaluation on the referenced parcel for a subsurface wastewater system in January 2023 for lot recordation and again in April 2023 for additional soils work for an EOP submittal. The soil/site evaluation was performed using hand auger borings and during moist soil conditions based on the criteria found in the State Subsurface Rules, 15ANCAC 18A .1900 "Laws and Rules for Sewage Treatment and Disposal Systems" along with "Regulations Governing Sewage Treatment and Disposal Systems in Harnett County, Amended October 27, 2011".

The lot is proposed for a 4-bedroom house. A septic system field layout was completed based on the house location surveyed in the field. The proposed system is a Pressure Manifold Distribution using lines 7-10 totaling 420 feet of accepted product (EZ-Flow). The repair field is a Pressure Manifold Distribution using lines 1-6 totaling 440 feet of accepted product (EZ-Flow).

Based on the findings during the field evaluation, the area on the attached map has at least 38 inches (initial) and 44 inches (repair) of provisionally suitable soils for an accepted status system. The assigned LTAR for the site is 0.30 gal/day/ft^2 with a maximum depth of 20 inches for the initial system installation of the drain lines due to slope correction. The assigned LTAR for the site is 0.30 gal/day/ft^2 with a maximum depth of 24 inches for the repair system installation of the drain lines due to slope correction.

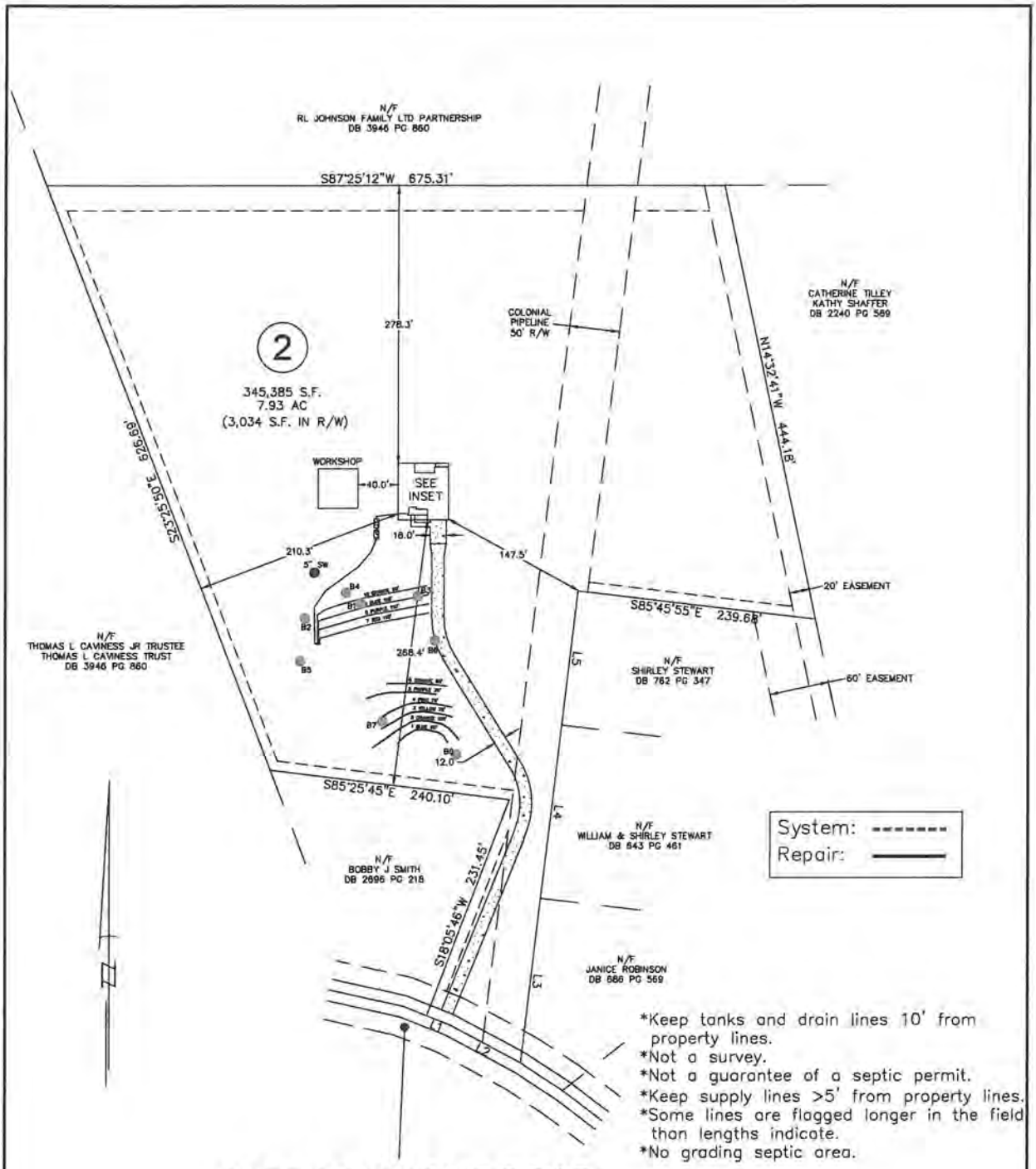
- Pressure Manifold Distribution Initial System, Accepted Product (420' for Initial)
- 20" maximum trench depth
- 0.30 LTAR
- 1000 gallon septic tank & 1000 gallon pump tank
- No grading/filling septic areas
- No cuts >2' within 15' of septic areas
- Keep tanks and drain lines 10' from property lines
- Keep supply line >5' property lines
- Install in dry soil conditions
- Maintain natural contours when clearing the lot

This letter discusses the location of provisionally suitable soils for subsurface wastewater disposal systems and does not guarantee the future function of any wastewater system on sites. Central Carolina Soil Consulting, PLLC is a professional consulting firm specializing in soil delineations and design for on-site wastewater disposal systems.

If you have any questions regarding the findings on the attached map or in this report, please feel free to contact me at anytime. Thank you allowing Central Carolina Soil Consulting to perform this site evaluation for you.

Sincerely,

Jason Hall
NC Licensed Soil Scientist #1248

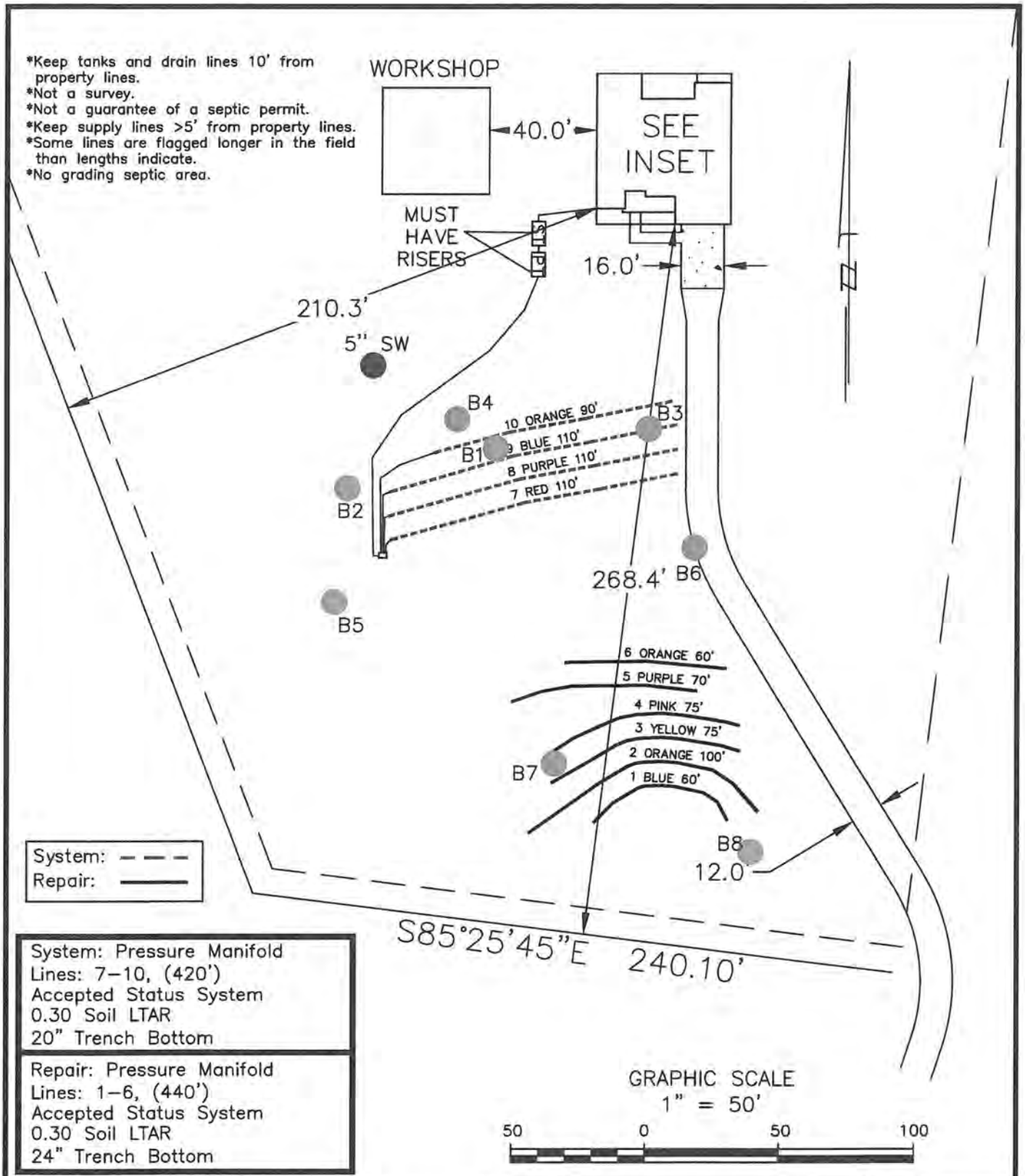


System: Pressure Manifold Lines: 7–10, (420') Accepted Status System 0.30 Soil LTAR 20" Trench Bottom
Repair: Pressure Manifold Lines: 1–6, (440') Accepted Status System 0.30 Soil LTAR 24" Trench Bottom

Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, North Carolina 27587
Phone (919)569-6704 Fax (919)569-6703

4–Bedroom Septic Layout
Lot 2, Baptist Grove Road
Harnett County, North Carolina

Job# : 4426
Drawn By : MS
Date : 04/20/2023



System: Pressure Manifold Lines: 7–10, (420') Accepted Status System 0.30 Soil LTAR 20" Trench Bottom
Repair: Pressure Manifold Lines: 1–6, (440') Accepted Status System 0.30 Soil LTAR 24" Trench Bottom

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Phone (919)569–6704 Fax (919)569–6703

4–Bedroom Septic Layout
Lot 2, Baptist Grove Road
Harnett County, North Carolina

Job# : 4426
Drawn By : MS
Date : 04/20/2023
Revision:

Sheet:
Property ID:
Lot #: 2
File #:
AppID:

CCSC SOIL/SITE EVALUATION
for ON-SITE WASTEWATER SYSTEM

Owner: CARUSO HOMES
Applicant:
Address:
Date Evaluated: 4/11/2023
Proposed Facility: 4-Bedrooom Design Flow (.1949) 480 gal/day
Property Size:
Location of Site: Baptist Grove Road
Property Recorded: Yes
Water Supply: [X] Public [X] Individual [X] Well [ ] Spring [ ] Other
Evaluation Method: [X] Auger Boring [ ] Pit [ ] Cut
Type of Wastewater: [X] Sewage [ ] Industrial Process [ ] Mixed

PROFILE #	.1940 Landscape Position/ Slope%	Horizon Depth (IN.)	SOIL MORPHOLOGY .1941 .1941 Structure/ Texture	.1941 Consistence Mineralogy	b PROFILE FACTORS .1942 Soil Wetness/ Color	.1943 Soil Depth (IN.)	.1956 Sapro Class	.1944 Restr Horiz	Profile Class & LTAR
1	LS	AE 0-6	GR SL	VFR NS NP SEXP					PS
	12%	Bt 6-38	SBK C	FR SS SP SEXP					0.30
		BC 38-48	W-SBK CL	FR SS SP SEXP		48			
2	LS	Bt1 0-5	SBK CL	FR SS SP SEXP					PS
	12%	Bt2 5-28	SBK C	FR SS SP SEXP					0.30
		BC 28-38	W-SBK CL	FR SS SP SEXP					
		C 38+				38			
3	LS	AE 0-5	GR SL	FR SS SP SEXP					PS
	10%	Bt 5-28	SBK C	FR SS SP SEXP					0.30
		BC 28-48	W-SBK CL	FR SS SP SEXP		48			
4	LS	AE 0-10	GR SL	VFR NS NP SEXP					PS
	12%	Bt 10-42	SBK C	FR SS SP SEXP					0.30
		BC 37-48	W-SBK CL	FR SS SP SEXP		48			
5	LS	AE 0-6	GR SL	VFR NS NP SEXP					PS
	6%	Bt 6-37	SBK C	FR SS SP SEXP					0.30
		BC 37-48	W-SBK CL	FR SS SP SEXP		48			

Description	Initial System	Repair System
Available Space (.1945)	Yes	Yes
System Type(s)	III B	III B
Site LTAR	0.30	0.30

Other Factors (.1946):
Soil Evaluation By:
Others Present:
Site Classification (.1948): Provisionally Suitable
Site Evaluation By: Michael Seewald
Others Present:

Sheet:

Department of Environment, Health, and Natural Resources
Division of Environmental Health
On-site Wastewater Section

Sheet:
File #:

SOIL/SITE EVALUATION
for ON-SITE WASTEWATER SYSTEM
CONTINUED

PROFILE #	.1940 Landscape Position/ Slope%	Horizon Depth (IN.)	SOIL MORPHOLOGY .1941		OTHER PROFILE FACTORS				Profile Class & LTAR
			.1941 Structure/ Texture	.1941 Consistence Mineralogy	.1942 Soil Wetness/ Color	.1943 Soil Depth (IN.)	.1956 Sapro Class	.1944 Restr Horiz	
6	LS	AE 0-6	GR SL	VFR NS NP SEXP					PS
	10%	Bt 6-36	SBK C	FR SS SP SEXP					0.30
		BC 36-48	W-SBK CL	FR SS SP SEXP		48			
7	LS	Bt1 0-2	SBK CL	FR SS SP SEXP					PS
	4%	Bt2 2-40	SBK C	FR SS SP SEXP					0.30
		BC 40-44	W-SBK CL	FR SS SP SEXP					
		C 44+				44			
8	LS	AE 0-6	GR SL	VFR NS NP SEXP					PS
	1%	Bt 6-48	SBK C	FR SS SP SEXP		48			0.30

COMMENTS: FILE #:

Landscape Position	Group	Texture	.1955 LTAR	Structure
R-Ridge	I	S-Sand	1.2 - 0.8	SG-Single Grain
SS-Shoulder Slope		LS-Loamy Sand		M-Massive
LS-Linear Slope				CR-Crumb
FS-Foot Slope	II	SL-Sandy Loam	0.8 - 0.6	GR-Granular
NS-Nose Slope		L-Loam		SBK-Subangular Blocky
HS-Head Slope				ABK-Angular Blocky
CC-Concave Slope	III	SI-Silt	0.6 - 0.3	PL-Platy
CV-Convex Slope		SICL-Silty Clay Loam		PR-Prismatic
T-Terrace				
FP-Flood Plain		CL-Clay Loam		
		SCL-Sandy Clay Loam		
	IV	SC-Sandy Clay	0.4 - 0.1	
		SIC-Silty Clay		
		C-Clay		

Consistence Moist	Consistence Wet	Mineralogy
VFR-Very Friable	NS-Non-Sticky	SEXP-Slightly Expansive
FR-Friable	SS-Slightly Sticky	EXP-Expansive
FI-Firm	S-Sticky	
VFI-Very Firm	VS-Very Sticky	
EFI-Extremely Firm	NP-Non-Plastic	
	SP-Slightly Plastic	
	P-Plastic	
	VP-Very Plastic	

Sketch of Soil Evaluation Locations

Caruso Homes
Engineered Option Permit

B. Drawings, Specifications, and Plans

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CARUSO HOMES

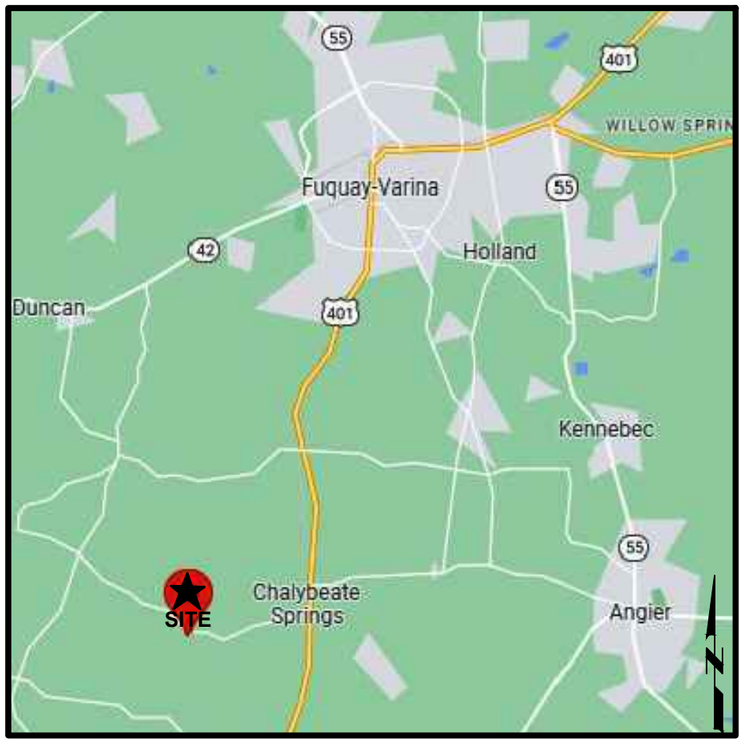
PRESSURE MANIFOLD SYSTEM
ENGINEERED OPTION PERMIT

1425 BAPTIST GROVE RD
FUQUAY- VARINA, NC 27526

PROJECT No. A73268.00

HARNETT COUNTY, NC

PIN#: 0643-77-5737



VICINITY MAP

LOCATION MAP

SCHEDULE OF DRAWINGS:

C-100	COVER SHEET
C-101	SITE LAYOUT
C-102	TREATMENT DISPOSAL AREA
C-103	NOTES
C-104	FORCE MAIN PLAN AND PROFILE
D-101	DETAILS 1 OF 5
D-102	DETAILS 2 OF 5
D-103	DETAILS 3 OF 5
D-104	DETAILS 4 OF 5
D-105	DETAILS 5 OF 5
E-101	ELECTRICAL DETAILS 1 OF 1

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE DESIGN PROFESSIONAL CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

RECORD DRAWING
NOVEMBER 21, 2023

NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL
11/21/2023

COVER SHEET	C-100

CARUSO HOMES
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE
JOB #: A73268.00
DATE: 05/03/2023

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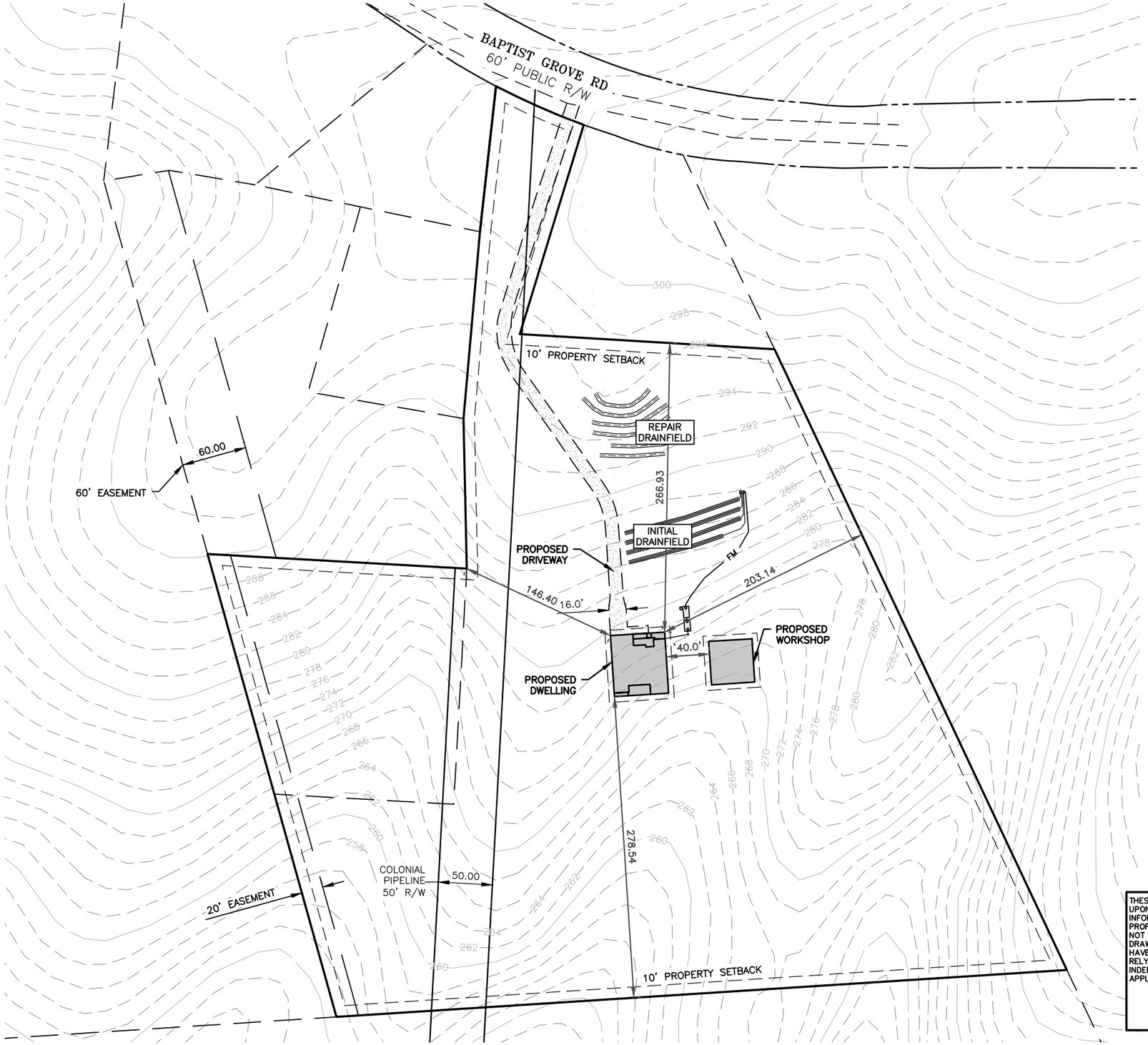

NOTES

1. PARCELS TAKEN FROM NC ONEMAP. TOPO TAKEN FROM NC FRIS. SITE PLAN AND SOIL INFORMATION PROVIDED BY PIEDMONT ENVIRONMENTAL ASSOCIATES, P.A.
2. KEEP TANKS, DRAIN LINES, AND MANIFOLDS A MINIMUM OF 10' OFF OF PROPERTY LINES.
3. KEEP SUPPLY LINES AND FORCE MAIN A MINIMUM OF 5' OFF OF PROPERTY LINES.
4. INSTALL INITIAL DRAIN LINES ON CONTOUR WITH A MAXIMUM TRENCH DEPTH OF 20".

LEGEND

- ADJACENT BOUNDARY
- BOUNDARY (PROPERTY)
- 420 — CONTOURS – INDEX
- 418 — CONTOURS – INTERMEDIATE
- PROPOSED INITIAL DRAIN LINES/TRENCHES
- PROPOSED REPAIR DRAIN LINES/TRENCHES
- SETBACKS
- FM — FORCE MAIN
- W — PROPOSED WATER LINE
- E — ELECTRIC LINE
- PROPOSED STORM DRAINAGE
- FLAG SEPTIC LINES NOT USED
- EASEMENT LINE
- CO — CLEAN OUT

N

GRAPHIC SCALE: 1" = 100'

0 50 100 200 300

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RECORD DRAWING
NOVEMBER 21, 2023

NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL

11/21/2023

SITE LAYOUT

C-101

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE
JOB #: A73268.00
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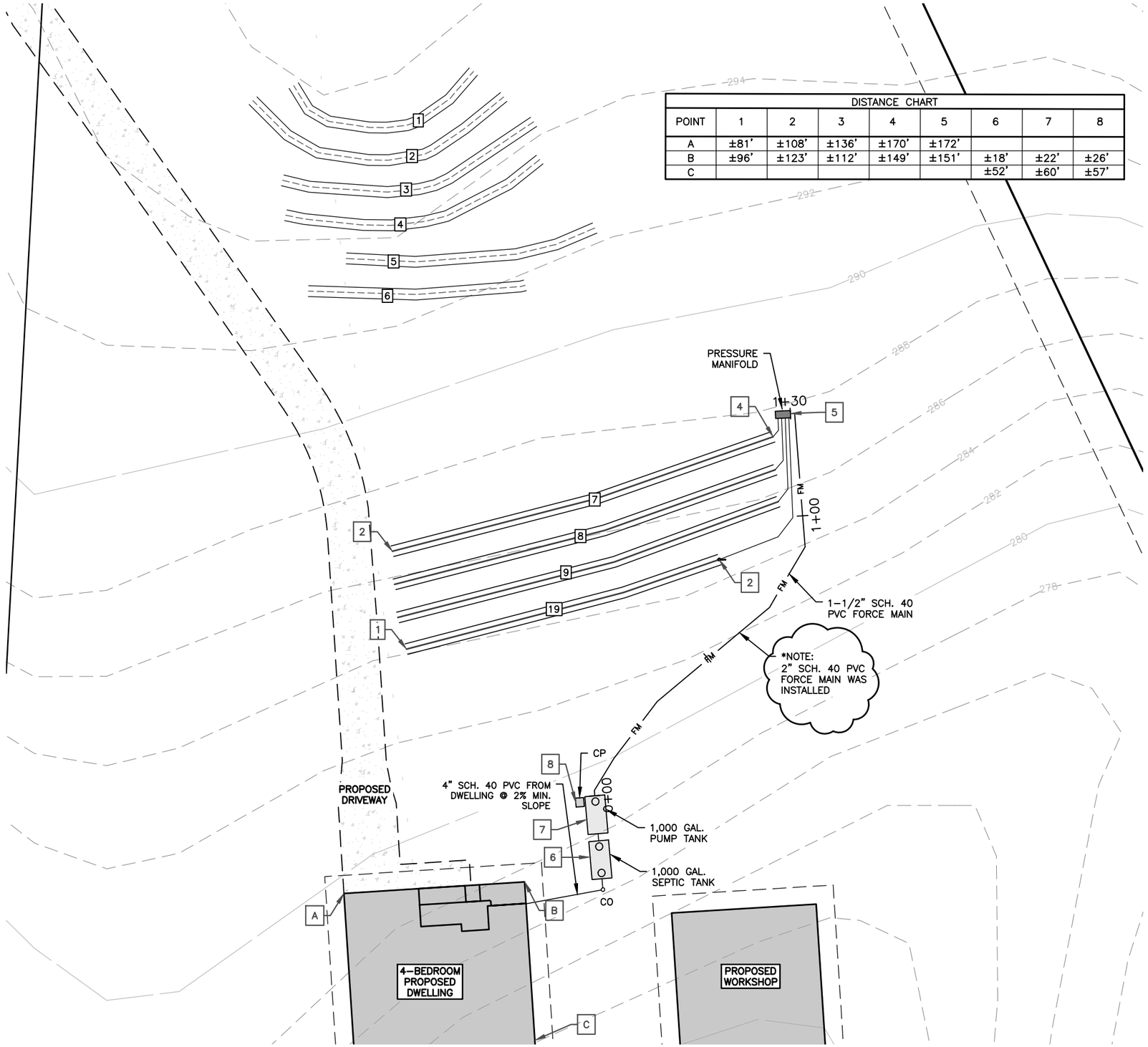

DISTANCE CHART								
POINT	1	2	3	4	5	6	7	8
A	±81'	±108'	±136'	±170'	±172'			
B	±96'	±123'	±112'	±149'	±151'	±18'	±22'	±26'
C						±52'	±60'	±57'

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- PROPOSED STORM DRAINAGE
- FLAG SEPTIC LINES NOT USED
- EASEMENT LINE
- CO CLEAN OUT

LINE SEGMENTS (INITIAL)			
LINE #	FLAG	LENGTH	DESIGN LENGTH
7	RED	110'	110'
8	PURPLE	110'	110'
9	BLUE	110'	110'
10	ORANGE	90'	90'
TOTAL LENGTH			420'

LINE SEGMENTS (REPAIR)			
LINE #	FLAG	LENGTH	DESIGN LENGTH
1	BLUE	60'	60'
2	ORANGE	100'	80'
3	YELLOW	75'	75'
4	PINK	75'	75'
5	PURPLE	70'	70'
6	ORANGE	60'	60'
TOTAL LENGTH			420'

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RECORD DRAWING
NOVEMBER 21, 2023

NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL
11/21/2023

GRAPHIC SCALE: 1" = 30'

0 15 30 60 90

TREATMENT, DISPOSAL AREA

C-102

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE
JOB #: A73268.00
DATE: 05/03/2023

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MAINTENANCE SCHEDULE

	FREQUENCY	TASK
WATER CONSUMPTION	MONTHLY	RECORD TOTAL GALLONS USED FROM METER AT POTABLE WATER SUPPLY SOURCE.
		PUMP OUT ACCUMULATED GREASE AND DISPOSE OF IN A STATE–PERMITTED MANNER/FACILITY.
SEPTIC TANKS	WEEKLY	CHECK EFFLUENT FILTERS AND CLEAN AS REQ'D.
	MONTHLY	CHECK FOR SOLIDS ACCUMULATION, BLOCKAGES, AND BAFFLE AND/OR EFFLUENT FILTER DAMAGE. CHECK FOR IN/EXFILTRATION OF LIQUID.
	12 MONTHS OR AS REQ'D	PUMP OUT ACCUMULATED SOLIDS AND DISPOSE OF IN A STATE–PERMITTED MANNER/FACILITY.
PUMP TANKS	WEEKLY	CHECK PUMPS FOR FUNCTIONALITY AND ABNORMAL VIBRATIONS. TEST CONTROL AND ALARM FUNCTIONS. RECORD PUMP ELAPSED TIME AND CYCLE COUNTER READINGS.
	MONTHLY	CHECK FOR SOLIDS ACCUMULATION, BLOCKAGES, AND BAFFLE DAMAGE. CHECK FOR IN/EXFILTRATION OF LIQUID.
	12 MONTHS OR AS REQ'D	PUMP OUT ACCUMULATED SOLIDS AND DISPOSE OF IN A STATE–PERMITTED MANNER/FACILITY.
COLLECTION SYSTEM	6 MONTHS OR AS REQ'D	USE CLEAN–OUTS TO CHECK VISUALLY FOR BLOCKAGES. REMOVE AND DISPOSE OF BLOCKED SOLIDS IN A STATE–PERMITTED MANNER/FACILITY.
PRESSURE MANIFOLDS	6 MONTHS OR AS REQ'D	MEASURE AND RECORD PUMP DOSING RATES FOR EACH FIELD. CHECK RESIDUAL PRESSURE AND ADJUST AS NECESSARY TO HEAD OF 3'–0". FLUSH OUT MANIFOLD AS NECESSARY.
DISPOSAL FIELDS	MONTHLY OR AS REQ'D	MOW VEGETATIVE COVER. CHECK FOR EROSION OR SURFACING OR PONDING OF EFFLUENT.
	MONTHLY	WATER LEVELS IN THE FIELD TRENCH OBSERVATION PORTS SHOULD BE INSPECTED/RECORDED.

DOSING CONTROL

SYSTEM SHALL DOSE ±2 TIMES PER DAY AT 212 GALLONS PER DOSE OR 25.1 MIN. AT 25.2 GPM.

FIELD DOSING OPERATING SEQUENCE

EFFLUENT FROM THE SEPTIC TANKS SHALL ENTER THE FIELD DOSING PUMP TANK, CAUSING THE WATER LEVEL TO RISE. AS THE LEVEL REACHES A FLOAT, DESIGNATED AS THE PUMP ON, A MERCURY SWITCH SHALL CLOSE, INDICATING THAT THE SYSTEM SHALL DOSE THE FIELD UNTIL THE LEVEL REACHES THE PUMP OFF LEVEL.

IF THE WATER LEVEL CONTINUES TO RISE HIGH ENOUGH FOR THE "HIGH WATER ALARM" MERCURY FLOAT SWITCH TO CLOSE, A RELAY SHALL CAUSE A FLASHING RED LIGHT ON THE PANEL FACE TO ENERGIZE, WHICH MAY ONLY BE RESET MANUALLY. ALSO, AN AUDIBLE ALARM WILL BE ENERGIZED.

THE PUMP TANK SHALL CONTAIN ONE PUMP. PUMP SHALL HAVE "HAND–OFF–AUTO" SWITCH, GREEN RUN LIGHT AND ELAPSED TIME METER.

NOTES

1. THE CONTRACTOR IS REQUIRED TO VERIFY ALL DIMENSIONS, ELEVATIONS, AND UTILITIES BEFORE BEGINNING ANY CONSTRUCTION.
2. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SOIL EROSION AND SEDIMENTATION CONTROL REQUIREMENTS OF THE COUNTY AND STATE.
3. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OSHA, NCDOT, AND SAFETY REQUIREMENTS OF THE COUNTY AND STATE.
4. CONTRACTOR IS RESPONSIBLE FOR REPAIRING ALL CONSTRUCTION DAMAGE EXPEDITIOUSLY AND AT NO ADDITIONAL COST TO THE OWNER.
5. FOUR OR SIX–INCH DIAMETER CORRUGATED PLASTIC TUBING SHALL COMPLY WITH ASTM F405 AND G.S. 150B–21.6.
6. NITRIFICATION TRENCH SHALL FOLLOW THE CONTOUR OF THE GROUND.
7. SURFACE WATER RUNOFF AND PONDING SHALL BE PROHIBITED AT ALL TIME.
8. SOIL COVER SHALL BE PLACED OVER A NITRIFICATION FIELD ONLY AFTER PROPER PREPARATION OF THE ORIGINAL GROUND SURFACE. THE TYPE OF SOIL COVER SHALL BE APPROVED BY THE LOCAL HEALTH DEPARTMENT.
9. ALL SERVICE ACCESS OPENINGS WILL BE A MINIMUM OF 24 INCHES UNLESS OTHERWISE SHOWN.
10. ALL JOINTS (MID–SEAM, TOP–SEAM) SHALL BE SEALED USING CONCRETE SEALANTS BUTYL SEALANT # CS–102 MEETING ASTM C–990.
11. TANKS SHALL BE LEAK–TESTED PRIOR TO SYSTEM START UP BY APPLYING A VACUUM OF 5–INCHES OF MERCURY WITH RISER ASSEMBLIES IN PLACE OR A 24–HOUR STATIC WATER TEST, IN ACCORDANCE WITH ASTM STANDARDS
12. ALL PIPE PENETRATIONS THROUGH PRECAST CONCRETE TANKS SHALL BE PRESS–SEAL CAST–A–SEAL 402 RUBBER BOOTS OR EQUAL AND GROUTED.
13. ANY CHANGES TO TANK LAYOUT AND INVERTS MAY BE ADJUSTED AS NECESSARY TO COMPLY WITH ACTUAL FIELD CONDITIONS UPON APPROVAL BY THE ENGINEER.
14. CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN TANK INSTALLATION WILL OCCUR SO FIELD INSPECTION CAN TAKE PLACE.
15. CONTRACTOR SHALL DIVERT SURFACE WATER FROM ALL TANK AREAS. (SEPTIC TANKS, ETC.)
16. VEGETATIVE COVER SHALL BE ESTABLISHED IMMEDIATELY AFTER FIELD INSTALLATION.
17. ALL COMPONENTS TO BE ACCESSIBLE AT GRADE WITHOUT ENTERING INTO THE RISER/TANK.
18. CONTRACTOR MAY USE LARGER TANKS WITH ENGINEER'S APPROVAL. PT DOSE VOLUME ETC. WILL CHANGE.
19. PRE–CAST CONCRETE SEPTIC AND PUMP TANKS DIMENSIONS SHOWN ARE BASED ON DAVID BRANTLEY & SONS. OTHER MANUFACTURERS ARE ACCEPTABLE, PROVIDED THEIR PRODUCTS COMPLY WITH APPLICABLE NCDENR–DEH RULES AND HAVE BEEN ASSIGNED A STATE APPROVAL NUMBER.
20. CONCRETE SHALL HAVE A MINIMUM 4,500 PSI AT 28 DAYS. CONCRETE SHALL BE WATERPROOFED WITH BITUMINOUS MASTIC OR OTHER APPROVED COATING SYSTEM.
21. EXCAVATE AREA FOR SEPTIC AND PUMP TANKS TO FIRM EARTH. LEVEL ON STONE. TANKS SHALL BE CAREFULLY BACKFILLED TO MAXIMUM 95% DENSITY. BACK FILL SHALL DIRECT WATER AWAY FROM ACCESS RISERS. IF MORE THAN 5 FEET OF COVER IS PROPOSED, CONSULT ENGINEER AND TANK MANUFACTURER TO DEVELOP STRUCTURAL AMENDMENTS.
22. FIELD VERIFY ACCESS RISERS BEFORE ORDERING.
23. VERIFY PUMP PLACEMENT WITH PUMP MANUFACTURER BEFORE ORDERING TANK, RISERS, AND HATCHES.
24. ALL PRESSURE PIPE AND FITTINGS IN TANKS SHALL BE SCH. 80 PVC UNLESS OTHERWISE SHOWN.
25. BALL AND CHECK VALVES SHALL BE RATED AT A MIN. OF 235 PSI.

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RECORD DRAWING
NOVEMBER 21, 2023

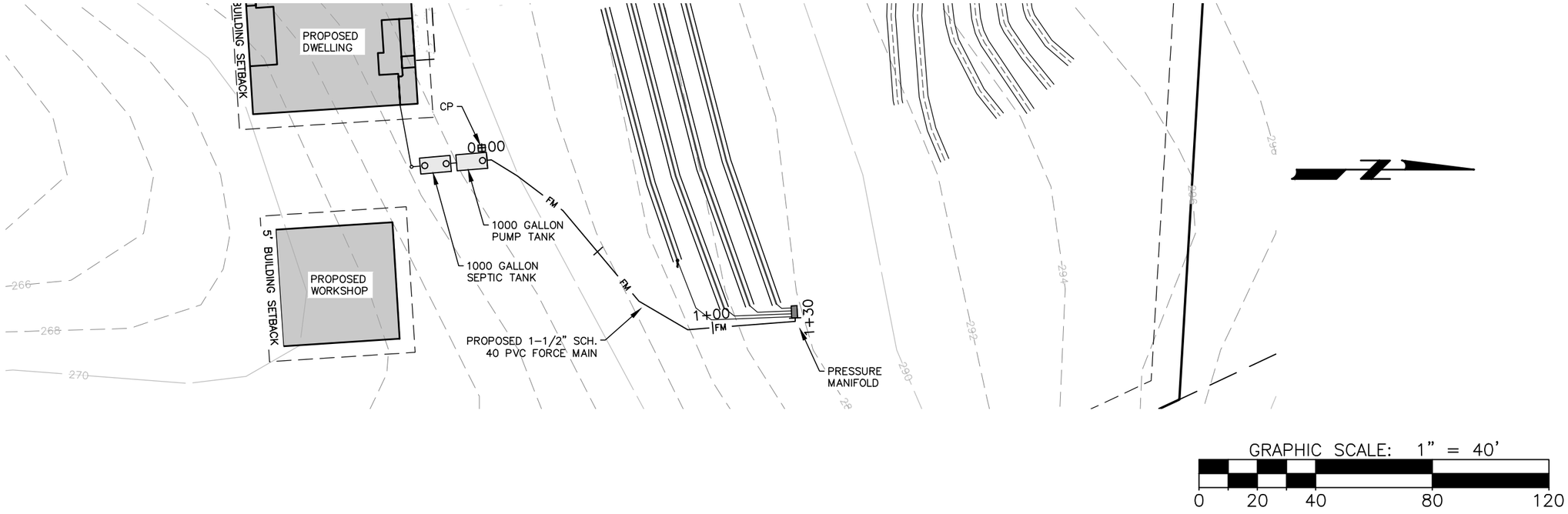
NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL
11/21/2023

NOTES | C-103

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

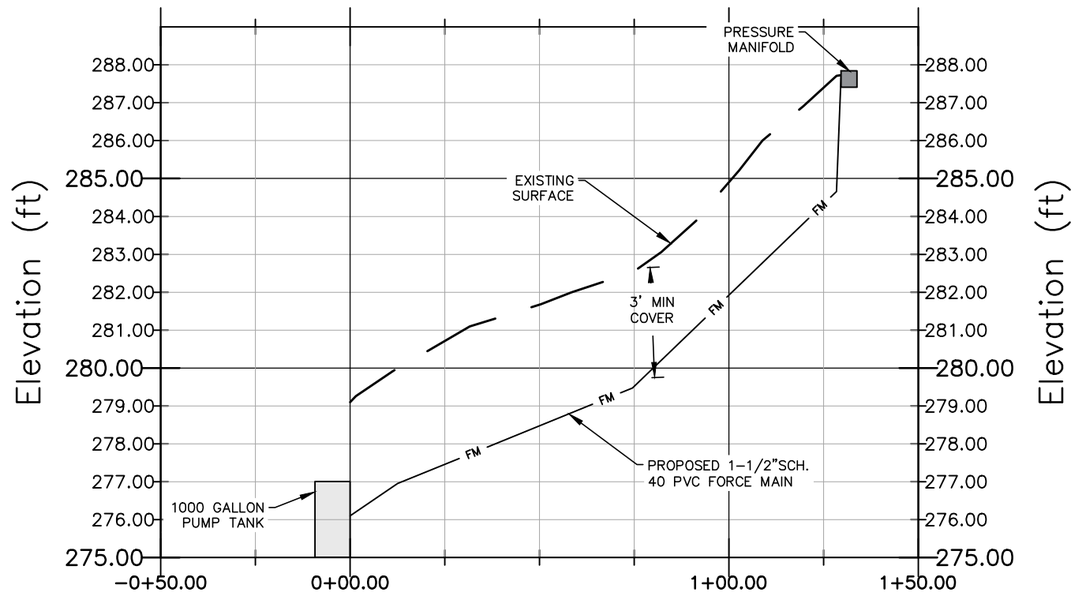
BY: EE | JOB #: A73268.00 | DATE: 05/03/2023

MacCONNELL & Associates, P. C.
501 CASCADE POINTE LANE, SUITE 103
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-6510



1 C-104 FORCE MAIN PLAN

1"= 40'



2 C-104 FORCE MAIN PROFILE

HORIZONTAL SCALE 1"= 40' ; VERTICAL SCALE 1"= 4'

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RECORD DRAWING
NOVEMBER 21, 2023

NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL

11/21/2023

FORCE MAIN PLAN AND PROFILE — C-104

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE | JOB #: A73268.00 | DATE: 05/03/2023

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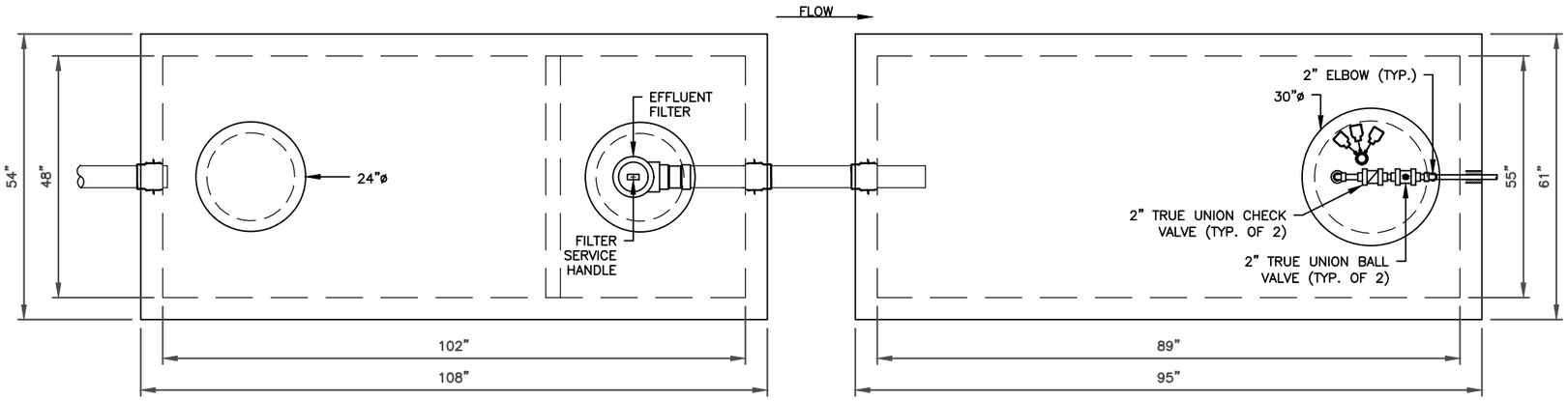

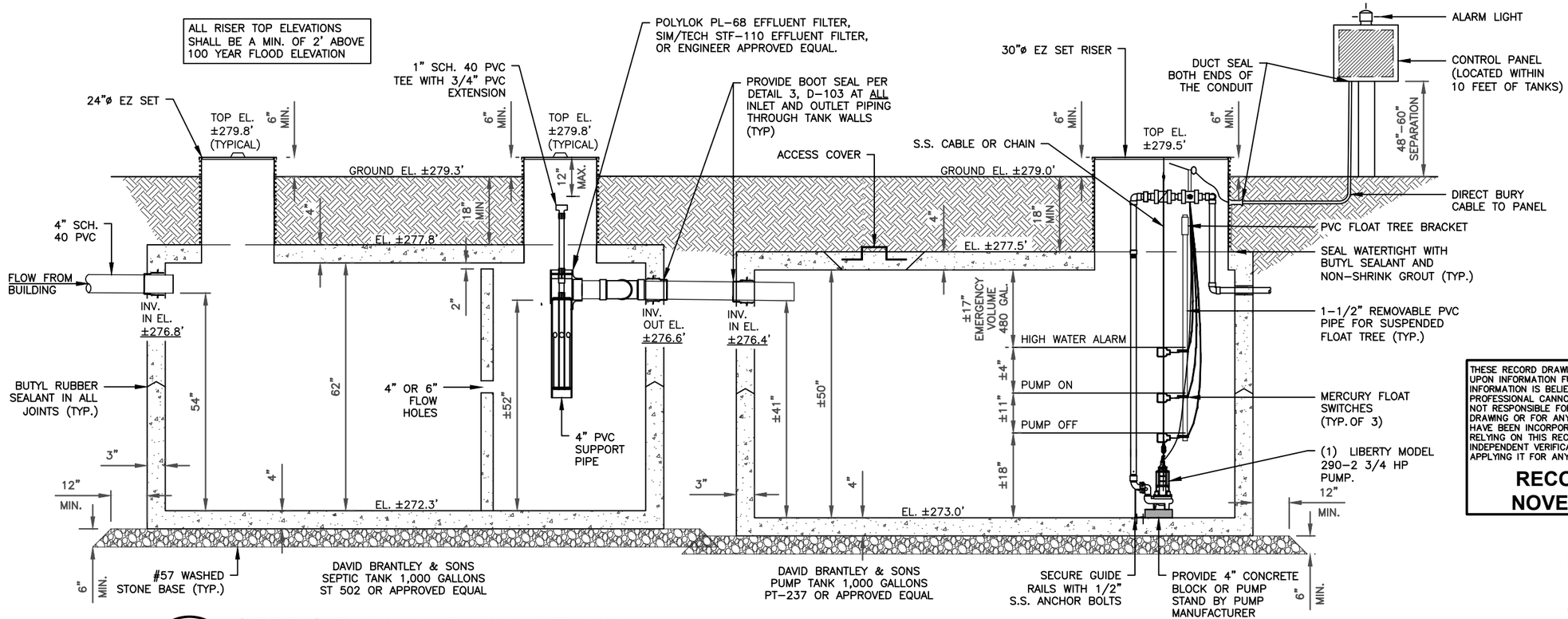

1 / D-101 SEPTIC TANK AND PUMP TANK
NTS

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RECORD DRAWING
NOVEMBER 21, 2023

NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL
11/21/2023

DETAILS - 1 OF 5

D-101

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE
JOB #: A73268.00
DATE: 05/03/2023

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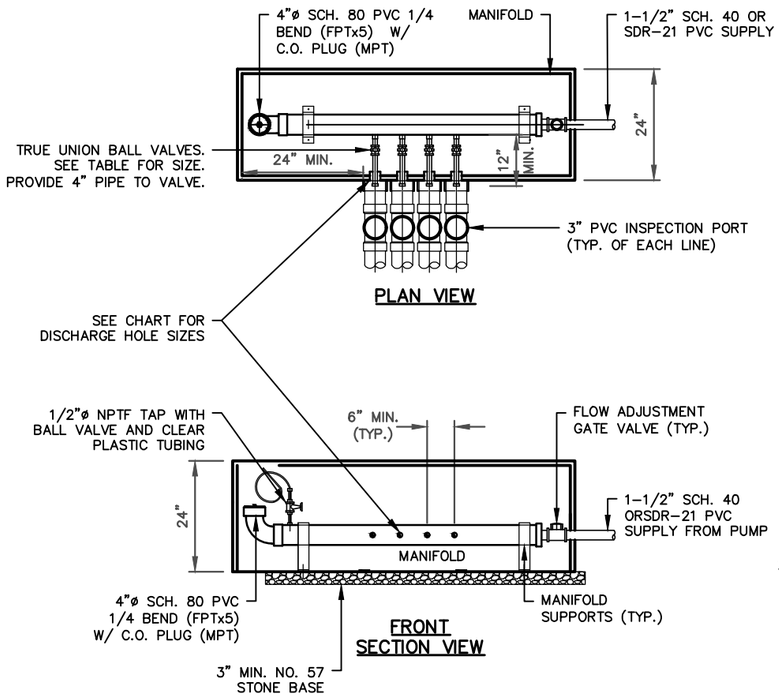

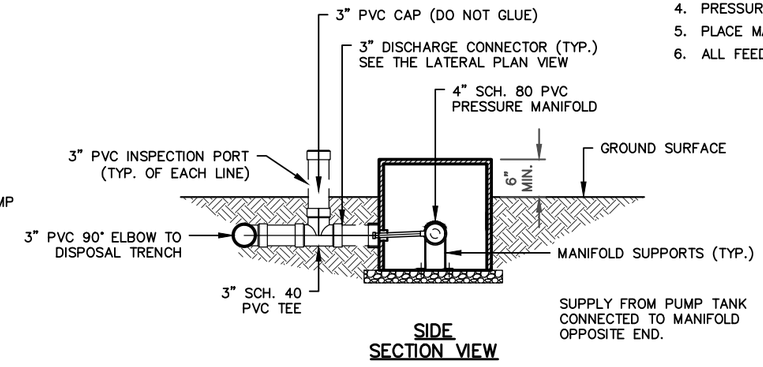

PRESSURE MANIFOLD (INITIAL LINES) TAP CHART

MANIFOLD TAP	LINES	FLAG COLOR	HOLE SIZES	LENGTH
1	7	RED	1/2" SCH. 40	110'
2	8	PURPLE	1/2" SCH. 40	110'
3	9	BLUE	1/2" SCH. 80	110'
4	10	ORANGE	1/2" SCH. 80	90'

PRESSURE MANIFOLD (REPAIR LINES) TAP CHART

MANIFOLD TAP	LINES	FLAG COLOR	HOLE SIZES	LENGTH
1	1	BLUE	1/2" SCH. 80	60'
2	2	ORANGE	1/2" SCH. 40	80'
3	3	YELLOW	1/2" SCH. 40	75'
4	4	PINK	1/2" SCH. 40	75'
5	5	PURPLE	1/2" SCH. 80	70'
6	6	ORANGE	1/2" SCH. 80	60'

NOTES:

1. LOCATE CENTERLINE OF BALL VALVE 4" FROM MANIFOLD.
2. MANIFOLD DISCHARGE PIPES SHALL EXTEND 2" FROM EDGE OF BOX INTO 3" PVC GRAVITY PIPE.
3. FIELD PRESSURE SHALL BE SET TO TWO FEET OF HEAD.
4. PRESSURE MANIFOLD SHALL BE CONCRETE OR BY EZ SET, PRESSBOX, OR AN APPROVED EQUAL.
5. PLACE MANIFOLD IN CENTER OF BOX.
6. ALL FEEDER LINES TO BE INSTALLED ON AT LEAST 1% POSITIVE GRADE.

1 D-102 **PRESSURE MANIFOLD**
NTS

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RECORD DRAWING
NOVEMBER 21, 2023

NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL
11/21/2023

DETAILS - 2 OF 5 | D-102

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE | JOB #: A73268.00 | DATE: 05/03/2023

MacCONNELL & Associates, P. C.
501 CASCADE POINTE LANE, SUITE 103
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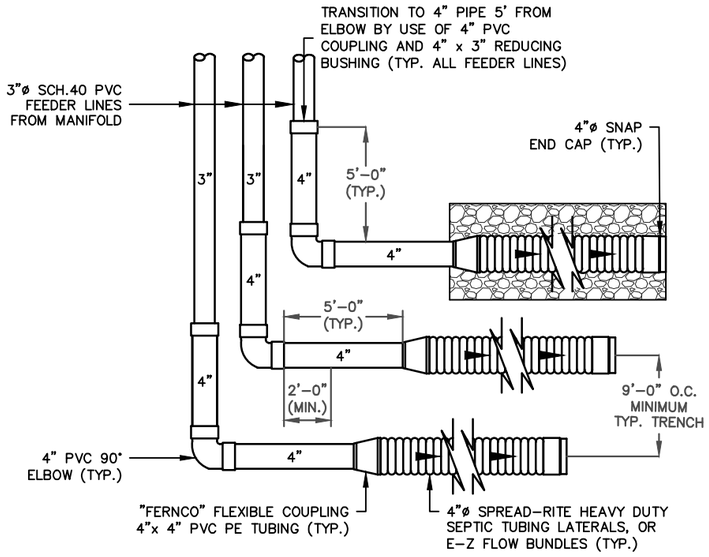
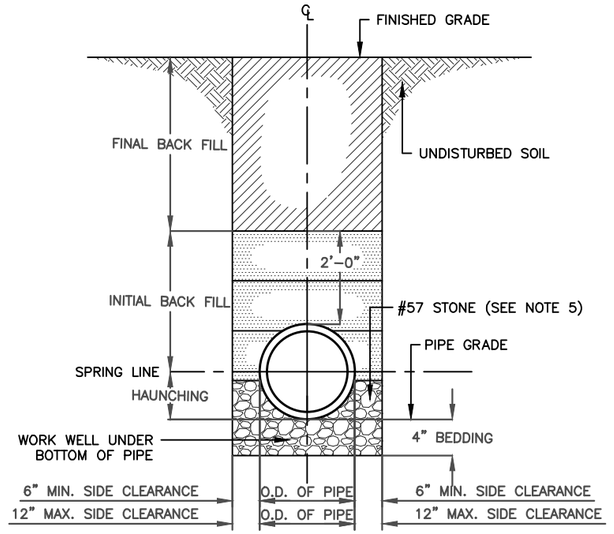


END FEED

1 D-103 LATERAL PLAN VIEW

NTS

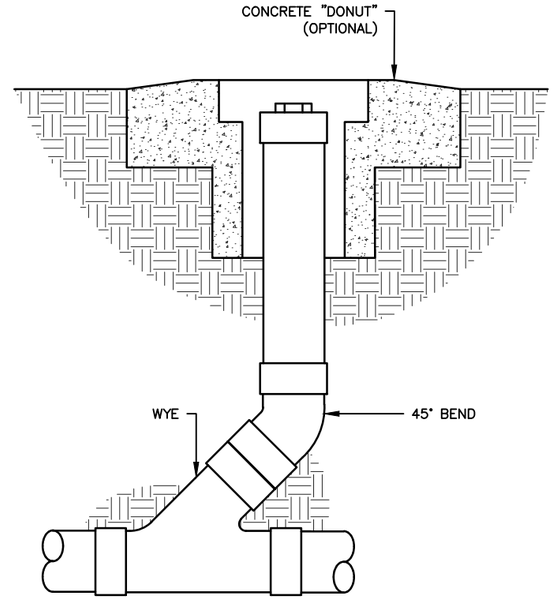


NOTES:

1. FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND THE BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
3. ALL BACK FILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACK FILL SHALL BE TAMPED IN 6" LAYERS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.
5. STONE BEDDING TO BE USED IF ROCK IS ENCOUNTERED.

2 D-103 GRAVITY SEWER INSTALLATION DETAIL

NTS

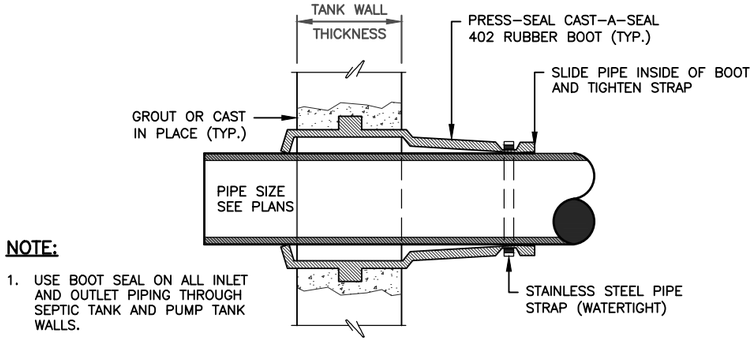


NOTES:

1. PIPING TO BE SCH. 40 PVC.
2. SEE SITE PLAN FOR PIPE SIZE.

3 D-103 GRAVITY CLEANOUT

NTS

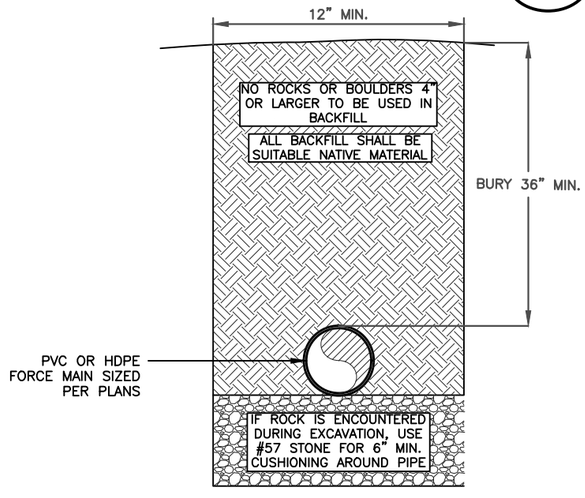


NOTE:

1. USE BOOT SEAL ON ALL INLET AND OUTLET PIPING THROUGH SEPTIC TANK AND PUMP TANK WALLS.

4 D-103 PIPE THRU TANK PENETRATIONS

NTS



5 D-103 FORCE MAIN PIPE LAYING TRENCH

NTS

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RECORD DRAWING
NOVEMBER 21, 2023

DETAILS - 3 OF 5

D-103

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE
JOB #: A73268.00
DATE: 05/03/2023

MacCONNELL & Associates, P. C.
501 CASCADE POINTE LANE, SUITE 103
CARY, NORTH CAROLINA 27513
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TEL: (919) 467-1239 FAX: (919) 319-6510

MACCONNELL AND ASSOCIATES, P.C.
CARUSO HOMES
PRESSURE MANIFOLD DESIGN - INITIAL

Name: Caruso Homes P.I.N. #: 0643-77-5737 D#: N.A

Address: 1425 Baptist Grove Rd, Harnett County, North Carolina Subdiv: Lot#: 2

# of BDR: 4 Daily Flow: 480 gal/day L.T.A.R.: 0.3 gal/day/sq.ft

Septic Tank: 1000 gals Pump Tank: 1000 gals Sq. Foot: 1260 Stone Depth: N.A

Number of Taps:	4		Length of Trenches:	420	ft(See Tap Chart for Details)
Depth of Trenches:	20	in	Manifold Length:	42	in
Manifold Diameter:	4 inches		Tap Configuration: 6 in spacing	1	side(s) of manifold
Supply Line: length:	130	ft	Diameter(Supply Line): 1-1/2 in. SCH40 PVC Pipe	ID (Inch)	1.61

Friction Loss + Fitting Loss:	8.69	ft(supply line length + 70' for fittings in pump tank)					
Design Head:	2	ft	Elevation Head:	14.40	ft		
Total Head:	25.1	ft	Pump to Deliver:	25.2	gals/min at	25.1	ft head

Dosing Volume: 212 gals.

Pump Selection: Drawdown: 212 gals divided by 20.3 gals/in = 10.5 inches head

Pump Selection: As shown on the construction drawings.

TAP CHART

Pump Tank Elevation 279.0 — Pump Elevation 273.3 — Manifold Elevation 287.7 — High Point in Forcemain: 287.7

Line	Color	Rod Read	Relative Elevation	Length	Hole Size	flow/tap	gal/day	Trench Area	LINE LTAR
7	Red		287.3	110	1.2in SCH40	7.11	135.5	330	0.411
8	Purple		286.5	110	1.2in SCH40	7.11	135.5	330	0.411
9	Blue		285.7	110	1.2in SCH80	5.48	104.5	330	0.317
10	Orange		284.7	90	1.2in SCH80	5.48	104.5	270	0.387

total feet = 420 gal/min = 25.2 LTAR = 0.300

%of Dose Vol.	78%	Des. Flow	480	(Itar + 5%)	0.315
Dose Volume	212	Pump Run=	19.06	(Itar W/25%reduction)	0.400
Dose Pump Time	8.4	Tank Gal/IN	20.3	(Itar + 5%)	0.420
Drawdown in Inches	10.5	Elev. Head	14.40		
Supply Line Length	130	Velocity fps	3.97		

Comments:

Hydraulic Profile

Manifold Elevation	287.7
Pump Tank Elevation	279.0
Pump Elevation	273.3

Supply Line Velocity Check

	ID (INCH)	gal/ft	Velocity Check (>2ft/s)
1-1/4 in. SCH40 PVC Pipe	1.38	0.077654555	5.40
1-1/2 in. SCH40 PVC Pipe	1.61	0.105696478	3.96
2 in. SCH40 PVC Pipe	2.067	0.174216673	2.41

1 D-104 PRESSURE MANIFOLD CALCULATIONS (INITIAL)

MACCONNELL AND ASSOCIATES, P.C.
CARUSO HOMES
PRESSURE MANIFOLD DESIGN - REPAIR

Name: Caruso Homes P.I.N. #: 0643-77-5737 D#: N.A

Address: 1425 Baptist Grove Rd, Harnett County, North Carolina Subdiv: Lot#: 2

# of BDR: 4 Daily Flow: 480 gal/day L.T.A.R.: 0.3 gal/day/sq.ft

Septic Tank: 1000 gals Pump Tank: 1000 gals Sq. Foot: 1260 Stone Depth: N.A

Number of Taps:	6		Length of Trenches:	420	ft(See Tap Chart for Details)
Depth of Trenches:	24	in	Manifold Length:	54	in
Manifold Diameter:	4 inches		Tap Configuration: 6 in spacing	1	side(s) of manifold
Supply Line: length:	266	ft	Diameter(Supply Line): 1-1/2 in. SCH40 PVC Pipe	ID (Inch)	1.61

Friction Loss + Fitting Loss:	30.90	ft(supply line length + 70' for fittings in pump tank)					
Design Head:	2	ft	Elevation Head:	22.2	ft		
Total Head:	55.1	ft	Pump to Deliver:	37.8	gals/min at	55.1	ft head

Dosing Volume: 203 gals.

Pump Selection: Drawdown: 203 gals divided by 20.3 gals/in = 10.0 inches head

TAP CHART

Pump Tank Elevation 279.0 — Pump Elevation 273.3 — Manifold Elevation 295.5 — High Point in Forcemain: 295.5

Line	Color	Rod Read	Relative Elevation	Length	Hole Size	flow/tap	gal/day	Trench Area	LINE LTAR
1	Blue		295.5	60	1.2in SCH80	5.48	99.6	180	0.387
2	Orange		294.8	80	1.2in SCH40	7.11	99.4	240	0.370
3	Yellow		294.2	75	1.2in SCH40	7.11	99.4	225	0.402
4	Pink		293.7	75	1.2in SCH40	7.11	99.4	225	0.402
5	Purple		292.3	70	1.2in SCH80	5.48	99.6	270	0.332
6	Orange		291.7	60	1.2in SCH80	5.48	99.6	180	0.387

total feet = 420 gal/min = 37.8 LTAR = 0.300

%of Dose Vol.	48%	Des. Flow	480	(Itar + 5%)	0.315
Dose Volume	203	Pump Run=	12.71	(Itar W/25%reduction)	0.400
Dose Pump Time	5.37	Tank Gal/IN	20.3	(Itar + 5%)	0.420
Drawdown in Inches	10.0	Elev. Head	22.20		
Supply Line Length	266	Velocity fps	5.95		

Comments:

Hydraulic Profile

Manifold Elevation	295.5
Pump Tank Elevation	279.0
Pump Elevation	273.3

Supply Line Velocity Check

	ID (INCH)	gal/ft	Velocity Check (>2ft/s)
1-1/4 in. SCH40 PVC Pipe	1.38	0.077654555	8.10
1-1/2 in. SCH40 PVC Pipe	1.61	0.105696478	5.95
2 in. SCH40 PVC Pipe	2.067	0.174216673	3.61

2 D-104 PRESSURE MANIFOLD CALCULATIONS (REPAIR)

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RECORD DRAWING
NOVEMBER 21, 2023

NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL
11/21/2023

DETAILS - 4 OF 5 | D-104

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE | JOB #: A73268.00 | DATE: 05/03/2023

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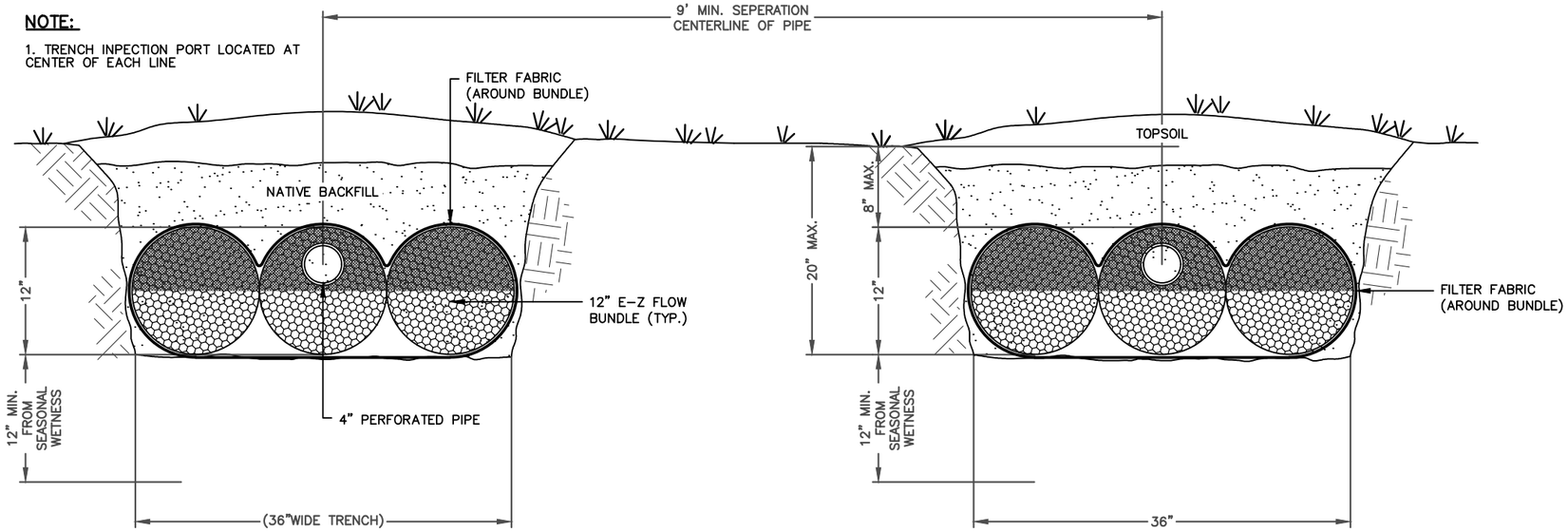

1 D-105 EZ FLOW TYPICAL TRENCH DETAIL

NTS

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11/21/2023

DETAILS - 5 OF 5 | D-105

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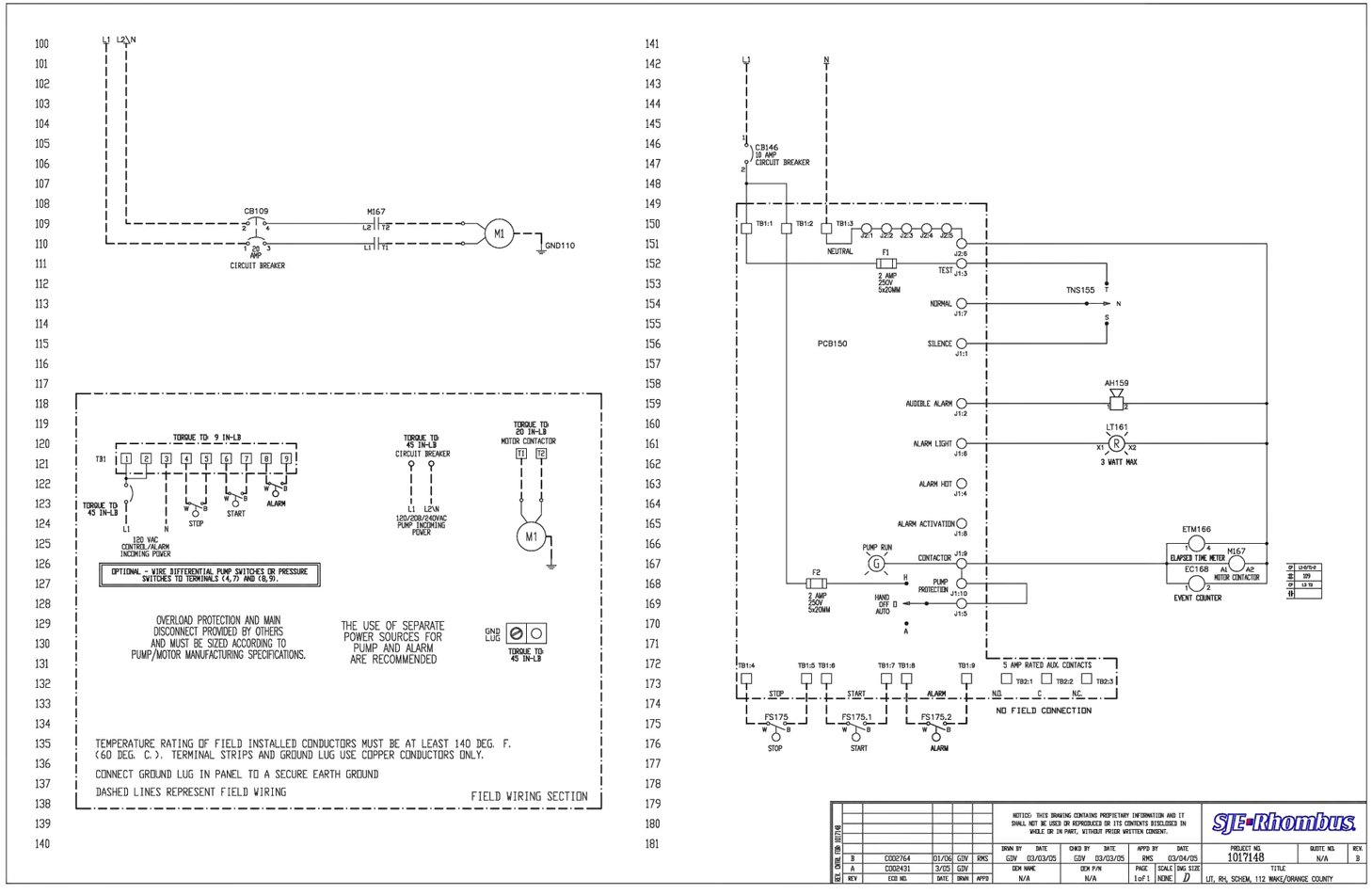

ELECTRICAL SPECIFICATIONS

1. CONTROL PANEL(S) WILL BE APPROXIMATELY 12"X10"X6" AND A NEMA 4X, UL RATED ENCLOSURE. PANEL(S) WILL BE SUPPLIED BY SJE RHOMBUS MODEL 112 CONTROL PANEL 1121W124H8AC10E15AI7J.
2. PANEL(S) SHALL BE MOUNTED, BY THE ELECTRICIAN WITHIN 10' OF THE TANK UNITS AND 48" – 60" OFF THE FINISHED GRADE TO THE BOTTOM OF THE ENCLOSURE.
3. THE ELECTRICIAN SHALL MAKE THE INTERNAL PANEL CONNECTIONS OF THE PUMP AND CONTROL CORDS. CONTROL PANELS WILL CONTAIN A WIRING SCHEMATIC IDENTIFYING ALL TERMINAL CONNECTIONS. THE SYSTEM INSTALLER WILL BUNDLE AND MARK EACH CORD WITH THE APPROPRIATE IDENTIFICATION AND SECURE IN THE ACCESS RISER AT THE PUMP POINT.
4. THE SIMPLEX DEMAND DOSE CONTROL PANEL REQUIRES DEDICATED CIRCUITS OF 15 AMPS, 115 VOLTS, SINGLE PHASE SUPPLIED FOR THE PUMP.
5. THE CONTROL PANEL REQUIRES A DEDICATED CIRCUIT OF 15 AMPS, 115 VOLTS SUPPLIED FOR THE ALARM/CONTROL SIDE OF THE PANEL.
6. A MINIMUM CONDUIT SIZE OF 1½" SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICIAN AS A CONNECTION BETWEEN THE CONTROL PANEL AND THEIR RESPECTIVE TERMINATION POINTS OUT IN THE TREATMENT AREA.
7. ALL OPEN CONDUIT ENDS SHALL HAVE REMOVABLE CLAY TYPE DUCT SEAL EMBEDDED TO PREVENT GASES AND MOISTURE FROM ENTERING THE CONTROL PANEL. DO NOT USE PERMANENT SILICONE OR EXPANDABLE FOAM PRODUCTS.
8. ALL PUMP AND FLOAT CONTROL CORDS WILL BE SUPPLIED WITH EITHER 30' OR 50' LEADS. THIS WILL HELP KEEP SPLICES TO A MINIMUM AND SHOULD BE AVOIDED IF AT ALL POSSIBLE. IF A SPLICE MUST BE USED, IT MUST BE MADE ABOVE GRADE IN A PLASTIC NEMA 4X JUNCTION BOX.
9. ALARMS SHALL BE AUDIBLE AND VISUAL.
10. AUDIBLE/VISIBLE ALARMS SHALL BE EXTERNAL TO ANY STRUCTURE.
11. PROVIDE DISCONNECT PER N.E.C.
12. ALL ELECTRICAL INSTALLATION SHALL BE PER N.E.C.
13. PROVIDE MANUAL TRANSFER SWITCH AND PLUG FOR PORTABLE EMERGENCY GENERATOR. PROVIDE DISCONNECT PER N.E.C.

1 / E-101 **DEMAND DOSED SIMPLEX CONTROL PANEL**
NTS

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE DESIGN PROFESSIONAL CANNOT ASSURE ITS ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS RECORD DRAWING OR FOR ANY ERRORS OR OMMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.

RECORD DRAWING
NOVEMBER 21, 2023

NORTH CAROLINA PROFESSIONAL SEAL 51201 ENGINEER DAVID C. BARCAL
11/21/2023

ELECTRICAL DETAILS
E-101

CARUSO HOMES
1425 BAPTIST GROVE RD
PRESSURE MANIFOLD SYSTEM
EOP
HARNETT COUNTY, NC

BY: EE
JOB #: A73268.00
DATE: 05/03/2023

MacCONNELL & Associates, P. C.
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Project Specifications

Excavation and Backfilling

1. Excavated materials acceptable as backfill shall be stockpiled in a location approved by the Owner. The materials shall be located away from the edge of any excavations. Excavated materials shall not be stored where existing trees are located.

2. All open excavations shall be barricaded when construction in the area has stopped. Night barricading should include posted warning lights.

3. Protect existing structures, utilities, sidewalks, pavement, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations. Protect root systems from damage or dry-out to the greatest extent possible.

4. Soil materials shall be free of boulders, roots, sod, organic matter, and frozen material.

5. Bedding materials for pre-cast concrete structure installation shall be #57 washed stone to the dimensions and depth shown on the construction drawings.

6. All excavation is unclassified and includes excavation to subgrade elevations indicated on the construction drawings regardless of character of materials and obstruction encountered. In the event rock is encountered, the Contractor shall remove it at no additional cost to the owner.

7. Stability of excavations shall be maintained by sloping of the sides and shall comply with local codes, ordinances, and requirements of agencies having jurisdiction. Where space restrictions prevent sloping of the sides, shoring and bracing of the walls shall be employed in full compliance with OSHA requirements. In the case of pipe installations, sheeting shall remain in place until backfilling progresses to a stage where no damage to the pipe will result from removal.

8. The Contractor shall attempt to prevent surface and subsurface water from flowing into excavations. The Contractor shall provide equipment, materials, and work necessary to dewater any accumulation of water in the excavation to prevent softening of the soils, undercutting of footings, and changes to the soils detrimental to the stability of the improvements.

9. Excavations for structures shall conform to dimensions and elevations shown on the construction drawings within a tolerance of plus or minus 0.10 feet and to the standards of ASTM C891-90.

10. Backfill shall be installed to excavated spaces in 8-inch lifts and tamped by hand or pneumatically around pipe or structures. Tamping shall be performed evenly on both sides

of pipe and around sides of structures to a depth such that damage to the pipe or structures is avoided as a result of subsequent methods of compaction. Extreme care shall be exercised in backfilling operations to avoid displacement of pipe and structures either horizontally or vertically. Backfill consolidation by ponding water is not permitted. Compaction of each layer of backfill and the top 6 inches of subgrade shall achieve a 90 percent maximum dry density as measured by AASHTO method T-99.

11. Remove all waste materials including unacceptable excavated material, trash, and debris and legally dispose of it off Owner's property. Where settling is measurable or observable at excavated areas during project warranty period, the Contractor shall remove surface finish, add backfill material, compact, and replace surface treatment to a quality and appearance matching adjacent areas of previous work.

Septic and Field Dosing Tank Installation and Testing

1. Septic tanks shall conform to criteria in 15A NCAC 18A .1952-.1954. The septic and field dosing tanks should be installed on a 12-inch minimum layer of No. 57 washed stone aggregate.

2. Place bell ends of pre-cast sections or the groove end of the concrete facing down. In preparation for making joints, all surfaces of the portion of the section to be jointed and the factory-made jointing materials shall be clean and dry. Each joint, seam, and pipe penetration inside and outside of joints shall receive liberal applications of non-shrink grout as well as liberal amounts of bitumastic waterproof sealant.

3. Lifting holes and other penetrations of the pre-cast structure wall shall be sealed with nonshrinking grout. Pipe connections shall be made so that the pipe does not project beyond the inside wall of the structure. Grout connections as necessary to make smooth and uniform surfaces on the inside of the structure.

4. Before placing any tank into operation, remove any dropped grout, sand or other imperfections and obstructions from the interior of the structure. Specifically, the inside walls of the tank shall be smooth and uniform. Smooth-finish inverts so that wastewater flow is confined and directed through the inlet and outlet pipes with easy transition.

5. Tanks shall be backfilled in accordance with the applicable specifications herein before described.

6. All pipe penetrations shall be through Press-Seal Cast-A-Seal 402 rubber connectors or approved equal.

7. All joints (mid-seam, top-seam) shall be sealed using Concrete Sealants butyl sealant #CS-102 meeting ASTM C-990.

8. All service access openings will be a minimum of 24 inches. All access openings shall be fitted with E-Z Set riser assemblies.

9. A 24-hour static water test, in accordance with ASTM standards, shall be performed on all precast tanks in order to insure they are watertight.

    a. The testing shall be performed in the presence of the engineer or his representative.

    b. Each tank shall be filled with water and the initial water level shall be measured.

    c. At the end of the 24-hour period, the level of the water shall be measured again.

    d. The engineer shall pass the tank if the water level did not drop more than 0.5 inches or if the total volume of the displaced water is less than 1 percent of the total effective liquid capacity of the tank.

    e. Tanks may also be leak-tested by applying a vacuum of 5-inches of Hg with riser assemblies in place.

    f. Each failed tank shall be tested again. In the event the tank does not pass the second test, the Contractor shall remove and replace the tank at no additional cost to the owner.

10. Septic Tank and Field Dosing Tank shall meet the following additional criteria:

    a. Minimum liquid depth of 36 inches.

    b. Minimum airspace of 9 inches.

    c. Length shall be at least twice as long as the width.

    d. Septic tank shall be constructed with a baffle wall dividing the tank interior $2/3^{rd}$ to $1/3^{rd}$. The baffle wall shall be constructed to permit passage of effluent through a slot or holes located between 45 and 55 percent of the interior depth.

11. Septic tank shall be fitted with either a POLYLOK PL-68 or SIM/TECK STF-110 effluent filter or engineer approved equal that extends down to 50 percent of the liquid depth of the tank.

12. Septic and field dosing tank model shall be as shown on the construction drawings or approved equal by engineer.

Piping Installation and Testing

1. Piping shall be PVC and of type and size as shown on the construction drawings. Piping shall be installed with a minimum of three (3) feet of cover unless shown otherwise on the construction drawings.

2. Piping shall be installed to be able to meet a pressure test whereby the pressure remains constant for a minimum of two hours, and the allowable leakage is not more than 10 gpd/inch of pipe diameter/mile.

3. Any line installed under a driveway shall be sleeved in Class 52 Ductile Iron Pipe or encased in concrete and extend a minimum of 5 feet on either side and as shown on the construction drawings.

4. Forcemains installed under streams shall be sleeved in Class 52 Ductile Iron Pipe as shown on the construction drawings.

Manifold Control Panel and Pumps

1. The control panel shall be by the Demand Dosed Simplex Control Panel Model 112 by SJE Rhombus or approved equal by engineer. The control panel will have the dose volume to be set as shown on the construction drawings.

2. The control panel shall be as specified on the construction drawings and installed per manufacturer's recommendation.

3. Manifold pump will be as specified on the construction drawings or approved equal by engineer and installed per manufacturer's recommendation.

Drain Lines

1. The drain lines shall be either Quick4 Plus Standard chambers by Infiltrator or EZflow (1203H – GEO type).

2. Drain lines shall be installed per manufacturer's recommendations unless shown otherwise on the construction drawings.

Caruso Homes
Engineered Option Permit

C. Reports on Special Inspections & Final Inspections

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Site Inspection Report For Pressure Manifold System

Client: Caruso Homes Date: 11/16/2023

Address: 1425 Baptist Grove Rd Arrival Time: 1:00 pm

Project #: A73268.00 Departure Time: 2:00 pm

Weather Conditions: Sunny 60°F

Installer (print) Tony Todd

Inspector (print) Tyler MacConnell Signature: Tyler MacConnell

Septic Tank

Is the septic tank the same manufacturer/model as specified on drawings? Yes ☒ No ☐

If no, record the following:

Manufacturer/Model _____

Capacity _____

If preapproved tank is used, is there a M&A stamp to verify a leak test was already performed and inspected at manufacturer's site? Yes ☒ No ☐

If yes, M#: 296

If no, perform and record leak test (see below):

Leak test date _____ Test start time _____ Test end time _____

Static Test	Vacuum Test *(Minimum Hold Time = 2 mins at 5 inches of Hg)*
Starting water level _____ inches	Starting negative pressure _____ inches of Hg
Ending water level _____ inches	Ending negative pressure _____ inches of Hg
Water level difference _____ inches	Negative pressure difference _____ inches of Hg
1% of tank liquid capacity _____ inches	10% of starting negative pressure
Difference ≤ 0.5" or 1% of tank capacity ☐ Yes ☐ No	Difference ≤ 10% of starting pressure ☐ Yes ☐ No

Septic Tank Effluent Filter (check one):

- [X] Polylok PL-68
- [ ] Simtech STF-110
- [ ] Other (manufacturer/model):_____
- [ ] None installed

Septic Tank Conditions	Satisfactory	N/A	Problem
Tank is installed on a 12-inch minimum layer of No. 57 washed stone aggregate.	[X]	[ ]	[ ]
Condition of the exterior walls and top of the tanks	[X]	[ ]	[ ]
Air vents present and open	[X]	[ ]	[ ]
Condition of risers and access lids	[X]	[ ]	[ ]
Condition of the interior walls (inlet/outlet/baffle/bottom)	[X]	[ ]	[ ]
Inlets and outlets are at proper location	[X]	[ ]	[ ]
Inlet and outlet tees on center line	[X]	[ ]	[ ]

Comments:_____

_____

_____

Pump Tank

Is the pump tank the same manufacturer/model as specified on drawings? Yes [X] No [ ]

If no, record the following:

Manufacturer/Model _____

Capacity _____

Gallons per Inch_____

If a preapproved tank is used, is there a M&A stamp to verify a leak test was already performed and inspected at manufacturer's site? Yes [X] No [ ]

If yes, M#: 271

If no, perform and record leak test (next page):

Leak test date _____ Test start time _____ Test end time _____

Static Test	Vacuum Test *(Minimum Hold Time = 2 mins at 5 inches of Hg)*
Starting water level _____ inches	Starting negative pressure _____ inches of Hg
Ending water level _____ inches	Ending negative pressure _____ inches of Hg
Water level difference _____ inches	Negative pressure difference _____ inches of Hg
1% of tank liquid capacity _____ inches	10% of starting negative pressure
Difference ≤ 0.5" or 1% of tank capacity ☐ Yes ☐ No	Difference ≤ 10% of starting pressure ☐ Yes ☐ No

Pump Tank Conditions	Satisfactory	N/A	Problem
Tank is installed on a 6-inch minimum layer of No. 57 washed stone aggregate.	☒	☐	☐
Tank is required size/loading per plan	☒	☐	☐
Condition of the exterior walls and top of the tank	☒	☐	☐
Air vent present and open	☒	☐	☐
Condition of risers and access lids	☒	☐	☐
Pump access is lockable, screwed, or secured to prevent unauthorized entry	☒	☐	☐
Pump access riser extends to at least 6" above finished grade	☒	☐	☐
Condition of the interior walls (inlet, outlet, baffle, and bottom)	☒	☐	☐
Inlet and outlet are at proper location	☒	☐	☐
Pump assembly is reachable from the surface without tank entry	☒	☐	☐
Pump removal rope, chain, or lifting device	☒	☐	☐
Independent float support system (float tree or bracket)	☒	☐	☐
Valves (check and shut-off) and vent installed /properly functioning	☒	☐	☐
Pump disconnects (unions) are accessible without tank entry	☒	☐	☐

Comments: _____

Control Panel

Is the control panel the same manufacturer/model as specified on drawings? Yes ☒ No ☐

If no, record the following:

Manufacturer/Model _____

Control Panel Conditions	Satisfactory	N/A	Problem
Enclosure watertight	☒	☐	☐
NEMA 4X rated enclosure	☒	☐	☐
Installed a minimum of 12" above finished grade	☒	☐	☐
HAND-OFF-AUTO (H-O-A) switch operable	☒	☐	☐
Pump and alarm on separate circuits	☒	☐	☐
Water/gas/corrosion-proof conduit or sealed putty	☒	☐	☐
No internal splices	☒	☐	☐
Alarm (visual and audible) and floats functioning properly	☒	☐	☐
Manual disconnect present and accessible	☒	☐	☐
Electrical inspection conducted	☒	☐	☐
Timer operable	☒	☐	☐
Elapsed time meter operable	☒	☐	☐
Cycle counter operable	☒	☐	☐

Control Panel - Dispersal Field Pump/Dosing Tank

(Choose One)

☒ Demand Dosed ☐ Timed Dosed

H-O-A switch set at: ☒ Auto ☐ Hand/Manual ☐ Off

Why:

Timer Setting: On Mode setting _____ minutes

Off Mode setting _____ ☐ minutes ☐ hours

Elapsed Time Meter Reading: _____ ☐ N/A

Cycle Counter Reading: _____ ☐ N/A

Comments: _____

_____

_____

Pump

Is the pump the same manufacturer/model as specified on site plans? Yes ☐ No ☒

If no, record the following:

Manufacturer/Model Liberty 290-2 HP 3/4

Pump Conditions	Satisfactory	N/A	Problem
Pumps are operable	☒	☐	☐
Pump access is a minimum of 6" above finished grade	☒	☐	☐
Pump assembly is reachable from the surface without tank entry	☒	☐	☐
Quick disconnects are operable	☒	☐	☐
Isolation valves are operable	☒	☐	☐
Anti-siphon/air release devices are operable	☒	☐	☐
Backflow prevention (check valves) are operable	☒	☐	☐
Air releases located below check valves are operable	☒	☐	☐
Drain back devices are operable	☒	☐	☐
Inline filters are operable	☒	☐	☐
Pressure gauges/ports are operable	☒	☐	☐
Sampling ports are operable	☒	☐	☐

Pump removal system installed/in place

☐ Stainless steel pull chain ☒ Pull rope ☐ Pump rails

☐ Other _____

Water Level Sensor Conditions	Satisfactory	N/A	Problem
Float trees/assemblies are removable	☒	☐	☐
Alarm floats/sensors operate audible alarm	☒	☐	☐
Alarm floats/sensors operate visible alarm	☒	☐	☐
Pumps are submerged at OFF elevations/levels	☒	☐	☐

Dosing Design Parameters

Demand Dosing	Timed Dosing	Dosing Volume
☒	☐	_____ gals

Pump Draw Down Test

Ending Depth – Beginning Depth = Drawdown, inches

Drawdown, inches X Tank gpi = Drawdown, gallons

Drawdown, gallons ÷ Pump Run, minutes = Pump, gpm

Beginning Depth	Ending Depth	Drawdown, inches	Tank gpi	Drawdown, gallons	Pump Run, minutes	Pump, gpm
52"	55"	3"	20	60 gallons	3 min	20 gpm

Comments:_____

_____

_____

Supply Line

Same material as specified on site plans? Yes ☒ No ☐ If no, record:_____

Same diameter as specified on site plans? Yes ☒ No ☐ If no, record:_____

Same length as specified on site plans? Yes ☒ No ☐ If no, record:_____

Same discharge pressure* as specified on site plans? Yes ☒ No ☐ If no, record:_____

*"design head" on tap chart

Distribution Device

(Choose One)

☒Pressure Manifold ☐Pressure Manitee ☐Other:_____

Distribution Device Conditions	Satisfactory	N/A	Problem
Distribution devices are watertight	☒	☐	☐
Minimum of 2 feet undisturbed soil to trench	☒	☐	☐
Proper center to center trench spacing maintained	☒	☐	☐
Devices installed on solid foundations	☒	☐	☐
All outlet inverts properly adjusted	☒	☐	☐
Turnups/cleanouts/valves are accessible	☒	☐	☐
Devices perform according to design specifications	☒	☐	☐

Comments:_____

_____

_____

Drain Field

Is the trench product the same manufacturer/model as specified on site plans? Yes

If no: manufacturer/model_____

Measure trench depth from downhill side

Line	Line Length	Inlet Depth	Middle Point Depth	End Point Depth
1	110'	20"	20"	20"
2	110'	20"	20"	20"
3	110'	20"	20"	20"
4	90'	20"	20"	20"
5				
6				
7				

Trench Conditions	Satisfactory	N/A	Problem
Installation depth per approved plans and specifications	☒	☐	☐
Soil cover adequate and per approved plans and specifications	☒	☐	☐
Trench spacing per approved plans and specifications	☒	☐	☐
Proper effluent distribution	☒	☐	☐
Pressure head meets parameters in approved specifications	☒	☐	☐
Product installation meets manufacturers specifications	☒	☐	☐

Is the area for repair field undisturbed? Yes ☒ No ☐

Comments:_____

System Layout

Is the location and orientation of the tank(s), supply line, and drain lines accurately recorded on the site plans? Yes ☒ No ☐

If no, record any variations on site plans for record drawings.

Measure locations of tanks, distribution devices, and drain lines using triangulation (two points) with respect to house (and/or property lines) and record distances on site plans for final record drawings.

Verify all setback requirements are met below, measure and record any distances that are close to the minimum limit on site plans for record drawings.

Setbacks	Satisfactory	N/A	Problem
Distance from system to any wells (100ft)	☒	☐	☐
Distance from system to foundation (5ft)	☒	☐	☐
Distance from system to basement (15ft)	☐	☒	☐
Distance from septic tank/ drain lines to all property lines (10ft)	☒	☐	☐
Distance from distribution box to all property lines (10ft)	☒	☐	☐
Distance from system to pool (15ft)	☐	☒	☐
System meets all other applicable setback requirements Rule .1950 (check back page)	☒	☐	☐

****For As-Built/record drawings measure and mark up the following ****
(measure two distances for each)

- ☐ Distance from septic tank to house_____
- ☐ Distance from pump tank to house_____
- ☐ Distance from pressure manifold/manitee to house _____
- ☐ Distance from house to closest line _____
- ☐ Distance from house to farthest line _____

Comments:_____

_____

_____

15A NCAC 18A .1950 LOCATION OF SANITARY SEWAGE SYSTEMS

(a) Every sanitary sewage treatment and disposal system shall be located at least the minimum horizontal distance from the following:

(1)	Any private water supply source, including any well or spring	100 feet;
(2)	Any public water supply source	100 feet;
(3)	Streams classified as WS-I	100 feet;
(4)	Waters classified as S.A.	100 feet, from mean high water mark;
(5)	Other coastal waters	50 feet, from mean high water mark;
(6)	Any other stream, canal, marsh, or other surface waters	50 feet;
(7)	Any Class I or Class II reservoir	100 feet, from normal pool elevation;
(8)	Any permanent storm water retention pond	50 feet, from flood pool elevation;
(9)	Any other lake or pond	50 feet, from normal pool elevation;
(10)	Any building foundation	5 feet;
(11)	Any basement	15 feet;
(12)	Any property line	10 feet;
(13)	Top of slope of embankments or cuts of 2 feet or more vertical height	15 feet;
(14)	Any water line	10 feet;
(15)	Drainage Systems:	
	(A) Interceptor drains, foundation drains, and storm water diversions	
	(i) upslope	10 feet,
	(ii) sideslope	15 feet, and
	(iii) downslope	25 feet;
	(B) Groundwater lowering ditches and devices	25 feet;
(16)	Any swimming pool	15 feet;
(17)	Any other nitrification field (except repair area)	20 feet;

(b) Ground absorption sewage treatment and disposal systems may be located closer than 100 feet from a private water supply, except springs and uncased wells located downslope and used as a source of drinking water, for repairs, space limitations, and other site-planning considerations but shall be located the maximum feasible distance and in no case less than 50 feet.

(c) Nitrification fields and repair areas shall not be located under paved areas or areas subject to vehicular traffic. If effluent is to be conveyed under areas subject to vehicular traffic, ductile iron or its equivalent pipe shall be used. However, pipe specified in Rule .1955 (e) may be used if a minimum of 30 inches of compacted cover is provided over the pipe.

Caruso Homes
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D. Management Program Manual

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HOMEOWNER GUIDE FOR UTILIZATION AND MAINTENANCE OF ON-SITE WASTEWATER DISPOSAL SYSTEMS

What is an On-site Wastewater Disposal System?

There are a number of different types of on-site wastewater disposal systems each designed for a specific set of site conditions. However, there are several system components that are common to most systems. These include the following:

1. A septic tank - a concrete tank that is designed to receive wastewater from the house and to provide a degree of pretreatment for the waste, chiefly through removal of some of the solids in the waste. Note that these solids accumulate over time and necessitate periodic pumping of the septic tank. Currently septic tanks are equipped with two access risers (normally constructed of concrete), which are designed to be at least 6 inches above the ground surface to prevent surface and shallow groundwater from entering the septic tank and to provide access for maintenance. **Care must be taken not to damage or cover these risers so that water inflow / infiltration can be prevented and the tank can be accessed for maintenance.**
2. In some installations, a pump tank - a concrete tank, very similar to the septic tank, which contains a pump along with the associated controls / componentry. The pump tank and pump is designed to receive effluent from the septic tank, and pump the effluent to a disposal field located at a higher elevation and/or to a pressurized distribution network in the disposal field. **The pump tank also has an access riser which must be protected in a similar manner to that indicated for the septic tank.** Servicing of the pump tank components often necessitates the assistance of a professional such as a septic tank installer or Certified Subsurface System Operator. The latter is required for operation and maintenance of certain types of systems.
3. A disposal field - a series of subsurface trenches and lines that are designed to distribute the effluent into the soil and provide for the ultimate treatment and disposal of the effluent. There are numerous variations on the design of the disposal field, related chiefly to the type of system chosen, site constraints, etc. Dependent on the type of disposal system, you may have to maintain a contract with a Certified Subsurface System Operator for operation and maintenance of your wastewater disposal system.

Utilization of Your Wastewater Disposal System

In order to obtain the maximum efficiency and life expectancy from your system, the following simple procedures must be adhered to:

1. **Practice water conservation.** This can include many practical considerations such as not leaving the water running while you brush your teeth, not overfilling the tub, limiting time in the shower, not replacing low flow fixtures with those of higher flows, over rinsing dishes (allow the dishwasher to do its job), immediate repair of any leaking fixtures, running washing machines and dishwashers only when full, etc.

NOTE: Washing machines generate significant volumes of wastewater. As a result, laundry activities should be spread over the week as opposed to accumulating all of laundry until the weekend.

2. **Do not utilize your wastewater disposal system as a trash can by dumping nondegradables down your drains or toilet.** These include cigarette butts, sanitary products, grease, plastics, disposable diapers, etc. Avoid use of garbage disposals. Do not retrofit garbage disposals unless the system is specifically permitted for their use. Also, do not dump harmful chemicals down the drain. These include petroleum products, paint, paint thinner, pesticides, antifreeze, etc.

Maintenance of Your Wastewater Disposal System

Every wastewater disposal system requires maintenance in order to function properly. The specific maintenance required is related to the type of system. The following are general considerations that apply to all systems.

1. **Protect your wastewater disposal system components including the tanks, access risers, disposal field and associated components.** Do not drive or park on any portion of the system. The area over the disposal field should be left undisturbed with the grass cover being maintained as you would your lawn. Location of trees and shrubs on or in close proximity to the disposal field is not recommended since roots may clog or damage your drain lines. Additionally, great care must be exercised when considering the addition of any structure(s) to the site. The location of any appurtenances cannot encroach on the installation or repair areas for your system. It is not recommended that irrigation systems be located in proximity to the disposal system since their construction can cause system damage and/or result in additional hydraulic load on the disposal field.
2. **Protect the system from excess surface and shallow groundwater.** The land surface on and around the wastewater disposal system should be landscaped to shed rainfall and runoff and prevent ponding. Be sure that foundation drains, runoff from roofs and drives, etc. are diverted away from the disposal system.
3. **Regularly have the septic tank / pump tank pumped and cleaned by a permitted septage hauler.** Although the necessary frequency of pumping varies with the household and system, most tanks need **pumping at a frequency of 3-5 years** and at any time solids occupy one-fourth to one-third of the septic tank liquid depth.

Note that all septic tanks being currently installed incorporate an effluent filter within the outlet compartment of the septic tank. This filter is to be cleaned anytime the septic tank is pumped. If plumbing becomes sluggish, this filter should be checked. If filter service is found to be necessary, the tank is to pumped, the filter cleaned and the filter reinstalled.

4. **Be alert to warning signs that your system may not be functioning properly.** These include sewage surfacing over the disposal system, sewage backups / slow draining in the house, lush growth over the disposal system, sewage odors, etc.
5. **Do not make or allow repairs to your system unless all necessary permits are obtained from the Local County Department of Environmental Services.**
6. **Commercial additives for septic tank systems** - It has generally not been demonstrated that these additives enhance the function of septic systems or reduce the need for tank pumping and other necessary maintenance.
7. **Special maintenance considerations** - As already alluded to, some of the more complex wastewater disposal systems require that you retain / maintain the services of a Certified Wastewater System Operator in order to comply with Laws and Rules and maintain a valid operation permit for your system. In the Local County this maintenance requirement should be recorded with Register of Deeds if applicable.

Where Do I Obtain Information and Assistance?

If you are purchasing a new home, you should request a copy of your wastewater system permit from the builder / seller along with information regarding any special maintenance requirements. You may also obtain information and assistance from the **Local County Department of Environmental Services**.

Caruso Homes
Engineered Option Permit

E. On-site Wastewater Contractor's Signed Statement

MacConnell & Associates, P.C.
501 Cascade Pointe Lane, Suite 103
Cary, North Carolina 27513

P.O. Box 129
Morrisville, North Carolina 27560

Phone: (919) 467-1239
Fax: (919) 319-6510

G&T Grading and Septic Tank and Hauling Company, Inc.
704 State Rd 2350
Zebulon, NC 27597

November 21, 2023

Mr. Oliver Tolksdorf, R.E.H.S, L.S.S.
Harnett County Department of Environmental Services
307 Cornelius Harnett Blvd.
Lillington, NC 27546

Re: Caruso Homes – 1425 Baptist Grove Road
Pressure Manifold System - EOP – Certification
MacConnell & Associates, P.C. Project No.: A73268.00

Dear Mr. Tolksdorf:

I certify that the above referenced project was installed with due care and to acceptable construction standards. The installation was contructed in conformance to the original construction documents. Any minor modifications were approved by the Engineer as noted on the record drawings. I trust that this letter meets your requirements for approving this system. Thank you.

Sincerely,

Sylvester Ellis
Foreman

cc: David C. Barcal, PE, MacConnell & Associates, PC
Caruso Homes

Caruso Homes
Engineered Option Permit

F. Statement Pursuant to 15A NCAC 18A. 1938(h)

MacConnell & Associates, P.C.
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501 Cascade Pointe Lane
Suite 103
Cary, NC 27513
www.macconnellandassoc.com

MacCONNELL & Associates, P.C.
"Engineering Today For Tomorrow's Future"

November 21, 2023

Mr. Oliver Tolksdorf, R.E.H.S, L.S.S.
Harnett County Department of Environmental Services
307 Cornelius Harnett Blvd.
Lillington, NC 27546

Re: Caruso Homes – 1425 Baptist Grove Road
Pressure Manifold System - EOP – Certification
MacConnell & Associates, P.C. Project No.: A73268.00

Dear Mr. Tolksdorf:

Upon inspection and start-up of the system of the above referenced system, I certify that the above referenced project was installed with due care and to acceptable construction standards, pursuant to 15A NCAC 18A .1938(h). The installation was constructed in conformance to the original construction documents with any approved minor modifications noted on the record drawings. I trust that this letter meets your requirements for approving this system. Thank you for your continued assistance, and if you have any questions, please do not hesitate to call me (919) 467-1239.

Sincerely,

David C. Barcal, P.E.
Project Manager

cc: Caruso Homes
Glenn Todd, G & T Grading and Septic Tank and Hauling Company, Inc.

Caruso Homes
Engineered Option Permit

Item 2. Notarized Letter Documenting Owner's Acceptance of System from the PE

MacConnell & Associates, P.C.
501 Cascade Pointe Lane, Suite 103
Cary, North Carolina 27513

P.O. Box 129
Morrisville, North Carolina 27560

Phone: (919) 467-1239
Fax: (919) 319-6510

NC 94

November 21, 2023

Mr. Oliver Tolksdorf, R.E.H.S, L.S.S.
Harnett County Department of Environmental Services
307 Cornelius Harnett Blvd.
Lillington, NC 27546

Re: Caruso Homes – 1425 Baptist Grove Road
Pressure Manifold System - EOP – Certification
MacConnell & Associates, P.C. Project No.: A73268.00

Dear Mr. Tolksdorf:

I certify that Caruso Homes is accepting the above referenced project from the Engineer: MacConnell & Associates, P.C. I trust that this letter meets your requirements for our acceptance of this system. Thank you.

Sincerely,

Joseph Davis
Caruso Homes

cc: David C. Barcal, PE, MacConnell & Associates, P.C.

Acknowledgement

I certify that Joseph Davis personally appeared before me this day, acknowledging to me that he or she signed the foregoing document.

Date: 11.21.23

Johnston County
North Carolina

Kent Hassell, Notary Public

My commission expires:
2.19.28

KENT HASSELL
My Commission Expires
NOTARY
PUBLIC
02-19-28
JOHNSTON COUNTY, NC